

THE ELECTRICAL ENGINEER

(INCORPORATED)

PUBLISHED EVERY WEDNESDAY 203 Broadway, New York.

Edited by T. COMMERFORD MARTIN AND JOSEPH WITELER.

A. C. SHAW, Secy. and Business Manager.

Telephone: 1223 Cortlandt. Cable Address: LENGINEER.

NEW ENGLAND OFFICE Room 70-620 Atlantic Avenue, Boston, Mass
WESTERN OFFICE 1564 Monadnock Building, Chicago, Ill
PHILADELPHIA OFFICE 916 Beta Building

Terms of Subscription

United States and Canada per year, \$2.00
Four or more Copies in Clubs (each) 2.50
Great Britain and other Foreign Countries within the Postal Union 5.00
Single Copies .10

[Entered as second-class matter at the New York Post Office, April 9, 1888.]

THE OLDEST ELECTRICAL JOURNAL IN AMERICA.

VOL. XX. NEW YORK, AUGUST 28, 1895. No. 382.

CONTENTS.

EDITORIALS:—
Is Telephony Triumphant? 206
Is the Present Type of Central Station Doomed? 207
Conduit Electric Railways 207

ARTICLES:—
The Growth of Long Distance Commercial Telephony (Illustr.) 197
Researches on the Electric Discharge of the Torpedo-Lighting Lamps and Geisler Tubes (Illustr.) A. D'ARSONVAL 200
The Electric Furnace and Chemistry at High Temperature (Illustr.) H. MOISSAN 201
New Signal Service Bicycle (Illustr.) 205
Scientific Uses of Liquid Air.—II. (Illustr.) PROF. J. DEWAR, F.R.S. 216
Three-Phase Transmission Plant at the Silver Lake, Col., Mines (Illustr.) 218

NEWS AND NOTES:—
Phosphorescence.—Method of Measuring Electric Capacities 199
The Horse Power of a Lightning Stroke 200
Comments on the Data Sheets.—Growth of the North American Telegraph Co.'s System 205
Indirect Electrolysis 207
To Purify Clay Magnetically 216
The Fate of One Municipal Plant Town 217

ELECTRIC TRANSPORTATION DEPARTMENT:—
The Baldwin-Westinghouse Alliance.—Light Railways.—Trolley Lines to the Atlanta Exposition.—Mortgage of the Cicero & Proviso Road.—Long Distance Work in Cleveland 202
The Washington Metropolitan Underground System.—The Demand for Horses.—An Aerial Trolley Boat (Illustr.)—The Tonawanda Walking Electric Man (Illustr.)—Two More Steam Lines to be Electrified.—Electric Railway Returns in Rochester, N. Y.—Sale of the St. Joseph, Mo., Trolley and Lighting Properties.—Modest Trolley Figures in Philadelphia 208

LETTERS TO THE EDITOR:—
Losses in Hydraulic Electric Railway Gear HAROLD BINNEY—HARRY E. DEY 204
The Superiority of the Differential Arc Lamp DR. LUXEMBURG 204
Speed of Electric Locomotives D. E. WHITING 204
Violation of Fire Underwriters' Rules in New York FREMONT WILSON 204

LITERATURE:—
Schoen's "Special Agents' Electrical Hand Book."—Trevort's "Practical Directions for Electric Gas Lighting and Bell Fitting for Amateurs."—Brumbe's "Cours E'lementaire d'Electricite'."—Walker's "Electricity in our Homes and Workshops."—"National Electric Light Association." (Report of the 18th Convention, Held at Cleveland) 205

TELEPHONY:—
The American Bell and Western Union Agreement of 1879—First and Full Publication of the Exact Text of the Famous Compact of 1879 208
General Telephone Protective Association.—Municipal Telephone Cases in Ohio.—Forty Miles of Sheep Ranch Telephony 214
Long Distance Telephony in St. Louis.—German Tests of the Telephone in War.—Telephone Notes 215

REPORTS OF COMPANIES:—
Closing out the Jaeger Lamp Co.—Assignment of the L Dynamo Co.—A New Building for the Commercial Cable 217

OBITUARY:—
W. A. Hammer.—Jason M. Bowen.—R. H. Gallaher 217

LEGAL NOTES:—
A Curious Electric Light Accident.—Edison Enjoined from Sending Kinetophones Abroad.—Curious Lighting Situation at Buckstone, Mass.—Am. Bell vs. Century and Bay State Companies 217

MISCELLANEOUS:—
The Incandescent Gas Burner and Street Vibration.—An Illuminated Orange Tower 217

INVENTORS' RECORD:—
Classified Digest of U. S. Electrical Patents Issued Aug. 20, 1895 219

TRADE NOTES AND NOVELTIES:—
The Growing Use of Medbery Fiberite.—Nightingale, Johnson & Co. 219
The Demand for Beacon Incandescent Lamps.—Activity of the Westinghouse Machine Co.—Telephones for the Navy Department.—The "Electra" Nuernberg Carbons for the Atlanta Exposition.—New York Notes.—Western Notes.—Philadelphia Notes.—New England Notes.—The Delaware Hard Fibre Co. 220

SUPPLEMENT.

DATA SHEETS:—
Computing Indicator Diagrams
Electric Railway Construction
Clear Wiring I. and II.

IS TELEPHONY TRIUMPHANT?

WE have the pleasure of presenting to our readers in this issue the full text of what must forever be regarded as one of the most important of the fundamental documents relating to and governing the development of both telegraphy and telephony in the United States, namely, the famous agreement of 1879 whereby the Western Union Telegraph Company, then an active competitor for the business, retired from the telephonic field, while in consideration of being left in full possession of the new domain the American Bell Telephone Company agreed to pay the handsome commission of 20 per cent. on its rentals or royalties. The document is full of interest at this juncture, when, as we show elsewhere, the telephone is everywhere paralleling the longer telegraph lines that yield the bulk of telegraphic income, and when it would appear that new adjustments to changed conditions must necessarily be in order.

Some of the daily papers have, we regret to note, presented seriously erroneous statements in regard to this famous document, and we are glad therefore to do the public service of setting matters right. It was hardly to be expected that either party to the agreement would go out of its way to correct the misstatements made; but as the document is, so far as we can form an opinion, creditable to the pacific intentions of both of them and exhibits the remarkable foresight of those who concluded it was better to enjoy a large income than to squander it on litigation, we think we may hold it up as an example that often might be followed most advantageously in electrical and other work. The ruination of many branches of electrical industry has been the frantic legal fighting in them and the destructive lowering of prices; but here we have clear evidence of a better way of doing things. It is obvious, also, that as an alternative to fighting or to consolidation, an agreement of this nature has many recommendations. The Western Union found it so in this case. We see, for ourselves, no ground for regret on its part, any more than we see any for regret as to its agreement with the Postal Telegraph-Cable Company to maintain rates at a living figure. The telegraph interests are subject like all others to the effect of new habits among the people, and must rise or decline in the long run as circumstances and events modify the environment; but skillful diplomacy will remedy many evil situations and not only find compensation for loss but new channels of unsuspected profit.

An agreement is essentially something to differ about, and hence it is not surprising that this famous document should itself have needed elucidation and interpretation. Some years ago, the Western Union Co. was understood to be seeking payment from the American Bell of moneys not nominated in the bond as rentals but which might bear that character. The final upshot of that contention has not been made known, so far as we are aware; the case even now, in some shape, may be slumbering quietly and conveniently on some court docket. Another point is the consent of the American Bell Company not to allow news matter to go over the telephone wires. For a long time past this has not been lived up to, but disregarded in a way of which the Western Union must be well aware.

For example there lies on our desk at this moment a late telephonic dispatch from New York in one of the Philadelphia daily papers, of no less than 55 lines, with a bold heading announcing the means of its transmission. One constantly sees such dispatches in the daily papers.

The date of expiration of this important contract is a matter of no little interest. According to Article 17, the contract would nominally expire seventeen years from the first day of November, 1879, but its continuance and further operation might well depend upon the Berliner patent, which has now become a football in the courts, but which as a means of sustaining monopoly fits neatly into the space left vacant by the expiration of the Bell fundamental patent named specifically in Article 2, section 8.

Triumphant Telephony is an idea that has seized upon many minds, but we can in no wise bring ourselves to believe that the telegraph is a defeated art or that when worsted it is to disappear off the face of the earth. It may be more sharply limited than it once was, but its future, to our eyes, is bright for usefulness, great and growing as the scope of telephony has now proved to be. The contrast between the relations in 1879 and those in 1895, as presented by our issue this week, is one of the most striking that electrical applications have ever shown. To-day our population averages barely over one telegram per head a year, while telephonic messages are more than ten times as numerous, the figures being in round numbers, respectively 75,000,000 and 750,000,000. Every twenty four hours the telephone is now used more than two million times, so that, broadly, four million people, or about 25 per cent. of the adult population, use it daily. Yet there was little prospect of such growth or of the infinite development now beginning under freer conditions, when the Western Union closed up or turned over its numerous telephone exchanges, and settled down to its own branch of the intercommunication industry.

IS THE PRESENT TYPE OF CENTRAL STATION DOOMED?

DR. D'ARSONVAL, who easily ranks first among electro-physiologists of France and who is recognized as an authority the world over, has just concluded a series of experiments on the electrical activity of the torpedo, technically known as the *raia electrica*, which are of such transcendent interest that we have devoted a page to recording them. Dr. d'Arsonval's researches have shown conclusively that the current effects obtainable from the torpedo are far beyond what had ever been thought possible, and as a result they have a bearing on the work of the electrical engineer which must command immediate attention.

If, as Dr. d'Arsonval has shown, an able-bodied electric torpedo can be depended on to give 7 amperes at 17 volts its utilization for central station and isolated plant work must suggest itself at once. Thus, taking for example, a 5,000 lamp station, all that would be required would be about 2,500 amiable fishes, grouped seven in series to give 119 volts, and 357 in parallel. With a reliable and automatic method of pinching the fishes there ought to be no difficulty experienced in regulation; and lamp breakage from this cause ought to be insignificant. The small cost of

installing a fish tank and the low rate of maintenance and fish food, as compared with the complication of boilers, engines, dynamos, coal expense and attendance, now required to generate current, leaves no question as to the superiority of the fish central station. Then again, with each fish capable of giving out 119 watts it would require only a fraction over 10 fishes to maintain twenty 50 watt lamps, a number sufficient to light the large majority of private houses. If the objection be raised that the fishes get tired after a while, it is a simple matter to have two or three sets installed and switch them on to the circuit successively, by means of the Pennock volt-distributor. Indeed, the more we examine into this subject the more we are convinced that in the direction of animal electricity lies the most promising opening for the future of lighting and that the electrical profession is under heavy obligations to Dr. d'Arsonval for pointing out the way of progress. As we go to press, the news reaches us that torpedo roe has gone up several hundred per cent. in price in consequence of a corner in the market.

CONDUIT ELECTRIC RAILWAYS.

THERE are not many conduit railways in this country, but the mileage that is actually in operation appears to be doing pretty well. The reports from Washington now are that, encouraged by its first success, the Metropolitan Company will untrrolley some of its lines and put in more conduit. If true, this is decidedly important. In New York City, the conduit road uptown of the Metropolitan Traction Co. is doing remarkably well, and several of the cars are now hauling trailers. One disagreeable feature of the system appears to be the frightful dust accompanying the passage of the car. The swift movement of the car above the slot, and, perhaps, the construction of the conduit, sets up a small cyclone, and the clouds of dust at some points, each time a car goes by, are startling in their volume and density. We have never seen a trolley car or a cable car make itself quite so obnoxious in this respect; but the evil is assuredly possible of correction.

INDIRECT ELECTROLYSIS.

M. Andreoli has described in *Le Génie Civil* an experiment on direct electrolysis. Taking a cell divided into three compartments by porous diaphragms, a solution of any salt is placed in the central compartment, whilst the two electrodes are placed in the side compartments immersed in similar or different electrolytes. The decomposition of these latter is, on the current being passed, effected as if the central compartment did not exist, the solution in it being unaffected. In this form the experiment is an old one, but M. Andreoli finds that if a plate or series of plates is placed in the solution in the central compartment, reactions occur which can only be attributed to an indirect or secondary electrolysis. If, for example, the two outer compartments are filled with a solution of common salt, and the central one with a solution of cyanide of gold; let the anode in the one compartment be of carbon, and the cathode in the other of iron. On passing a current under these conditions chlorine is evolved at the carbon electrode, and caustic soda produced at the other, the cyanide solution being, as aforesaid, unaffected. If, however, whilst the current is passing, a series of metal plates are immersed in the cyanide solution, the gold is deposited on them, though neither chlorine nor soda appears to pass into the central compartment.

TELEPHONY.

THE AMERICAN BELL AND WESTERN UNION AGREEMENT OF 1879.

FIRST AND FULL PUBLICATION OF THE EXACT TEXT OF THE FAMOUS COMPACT OF 1879.

SUBJOINED is given the full text of the famous agreement of 1879, between the American Bell Telephone Co. and the Western Union Telegraph Company, by which the former agreed to pay the latter a commission of 20 per cent. royalty on its telephone rentals and the latter agreed to abandon its existing exchanges and abstain from all telephone business. This agreement nominally terminates, as will be seen, in November, 1896. It should be studied in connection with the article in this issue of THE ELECTRICAL ENGINEER on the remarkable development of the long-distance telephone system as a formidable competitor for business hitherto going over the telegraph wires.

THIS AGREEMENT, MADE THIS TENTH DAY OF NOVEMBER, 1879, BY AND BETWEEN THE *Western Union Telegraph Company*, FOR ITSELF AND FOR THE *Gold and Stock Telegraph Company*, *American Speaking Telephone Company*, AND *Harmonic Telegraph Company* WHICH IT REPRESENTS, PARTY OF THE FIRST PART, AND THE *National Bell Telephone Company*, PARTY OF THE SECOND PART, WITNESSETH :

ARTICLE 1. (1.) The party of the second part shall pay to the party of the first part, upon all telephones used in the United States, under any license from the party of the second part, express or implied, unless expressly excepted, a royalty or bonus of twenty per cent. of all rentals or royalties actually received or rated as paid in accordance with the provisions of this contract, from licenses or leases for speaking telephones (exclusive of call bells, batteries, wires, and other appliances, or services furnished or performed). The rentals or royalties upon which said royalty or bonus to be paid to the party of the first part is to be reckoned, shall, for that purpose, be ascertained by deducting from the gross rental or royalty received or rated as hereinafter declared, the commissions and allowances herein provided for.

(2.) The royalty or bonus to be paid on telephones made in the United States solely for export and not licensed for use in the United States, shall be twenty per cent. of the net profit actually derived by the party of the second part in their manufacture and sale above the cost of such manufacture, not including any part of the general expense of the party of the second part as part of such cost, and not including in the manufacturer's profit any enhancement of price fairly due to the fact that the party of the second part holds or in any way controls a monopoly of the use of such telephones in any foreign country other than Canada, if such case shall exist.

Provided, however, that where the party of the second part shall be in any way interested in the purchase or use of such telephones in such foreign country, it shall be at the option of the party of the first part to require an accounting for all telephones so exported as if sold at a fixed profit of thirty-three and one-third per cent. upon the cost of manufacture.

(3.) Allowance shall be made for rentals or royalties which cannot be collected, and for usual and reasonable deadhead or free privileges.

ARTICLE 2. Concerning the sum which is to be taken as the gross rental or royalty for the purposes of the preceding article, it is declared and agreed :—

(1.) The word "telephone," as used in this contract, refers to an instrument for electrically transmitting or receiving articulate speech, and is understood to mean either a transmitting instrument incapable of use as a receiver, a receiving instrument incapable of use as a transmitter, or an instrument capable of being used both as a transmitter and receiver.

(2.) Ten dollars per annum for each telephone where only one is used at a terminal or station, and fifteen dollars per annum for a pair of telephones composed of an instrument used for sending and another instrument used for receiving, used at one terminal or station, are recognized as the present standard rates of gross rentals or royalties; and the party of the second part may change them, subject to the qualifications of section (4) and (5) of this article, but not otherwise.

(3.) Telephones used on exchanges or lines owned in whole or part by the party of the second part, or by auxiliary corporations or organizations in which it is interested, or rented together with lines owned in whole or part by it or by auxiliary corporations or organizations in which it is interested, shall be rated as paying to said second party the said recognized standard rates, or such other rates as may hereafter be established in accordance with this contract for like uses by parties other than the second party or auxiliary corporations or organizations in which it is interested, less the commissions and allowances provided for by this con-

tract; but whenever the party of the second part is or shall be interested with others in the ownership of such exchanges or lines, the annual rental or royalty actually charged to and received from the owners thereof for the use of the telephones, if greater than the rates established as aforesaid, shall be taken to be the gross rental for the purpose of ascertaining the stipulated bonus or royalty.

(4.) No reduction from the present recognized standard rates which shall be made on telephones used on exchanges or lines owned in whole or in part by the party of the second part or by auxiliary corporations or organizations in which it is interested, or rented together with lines owned in whole or in part by it, or by auxiliary corporations or organizations in which it is interested, shall operate to reduce said royalty or bonus to be paid to the party of the first part below \$1.00 per annum for each terminal single telephone, and \$1.80 per annum for each terminal pair, unless such reduction be made with the consent of the first party, or as provided in the following section.

(5.) Whereas it is difficult to determine absolutely and in advance the price which at all times and for all purposes it will be advantageous for the interests of the patents and of both the parties as interested in income derived from royalties and rentals, to charge, either with a view of increasing the revenue of the parties hereto from royalties and rentals by enlarging the demand for the instruments, or under circumstances of competition, it is agreed that the party of the second part, in cases where its power to reduce is qualified as hereinbefore expressed, may reduce the rentals either generally or for a particular purpose, or a particular locality, or a particular licensee or class of licensees, to such sum as may be advantageous as aforesaid for the interests of both parties and as may be determined by agreement of the parties hereto, or as provided in this article. If the parties do not agree as to the propriety of such a reduction, or as to the amount, extent or manner thereof, then said second party may in writing notify the first party of its desire for a reduction, and shall specify in such notice the reduction it desires and the character thereof, and the reasons therefor, and request the other party to join with it in selecting and appointing three referees. If the parties hereto shall not jointly appoint three referees within seven days from the receipt of such notice, then the moving party may, within seven days after the expiration of said first period, name one referee and notify such appointment to the other party, and request it to appoint another referee within seven days after receipt of notice of such appointment. If said other party shall not appoint a second referee within said period, then the moving party may give to the party in default written notice of the former application and notices, and that the time therein specified has expired, and that the moving party has not received information of the appointment of a referee by the other in accordance therewith, and inclosing copies of said former notices, and the party of the first part within one week after receipt of the last described communication, may in writing appoint a referee and notify such appointment to the other party, and thereupon the reference shall be proceeded with as herein provided; and the change specified in the notice first given as above shall be deemed agreed to, and shall *ipso facto* take effect and be established upon the expiration of the period last above referred to, unless the other party shall appoint a referee as aforesaid within said period. Said two referees shall jointly select and in writing appoint a third within ten days after the appointment of the second of said two. If said two do not select and appoint a third within the period above specified, then the moving party may apply to any Judge of the United States Circuit or District Court in the cities of Boston, or New York, or Brooklyn, and request him to appoint said board of three referees. Said judge shall not be required to and shall not consider whether any occasion or right to such reduction exists, and he shall act summarily in appointing said three referees, having first given the parties reasonable opportunity to be heard on such notice as he shall think fit. If any judge applied to shall decline to act, then the moving party may apply to some other of the persons above designated. All the three referees, however appointed, shall be disinterested, and not officers nor in the employ of any of the parties named in this contract. An award in writing, made and signed by any two of them shall stand as the award of the board. Unless the decision is made and notified to the parties within thirty days from the appointment of the three referees, the moving party may, at its option, treat the reference as void and inoperative, and a new appointment may be called for in the manner and with the effect herein specified. Said referee shall have power to determine whether occasion for a reduction exists for the reasons stated in the preamble of this section, and if so, then to determine how far, to what extent, and for how long the said limitation on the power of the second party to reduce the rentals shall be removed or modified. After such removal or modification the said limitation, as modified, unless and until further changed as herein provided, shall stand and be in all respects in lieu of that hereinbefore declared. During six months after a decision so made, no new reference upon the same subject before submitted can be asked for; but during that period either party may apply to the same board of referees, and said board, if it shall find that a new state of facts, or new exigencies

have arisen and require some change, may make such change in their award as they find occasion for as aforesaid, and such change shall stand and be operative from the time it is made and notified to the parties until further change be made by said board within said period, or by a new reference called for after said period, or by agreement of said parties. If during said period any arbitrator dies, refuses, or for any reason is unable to act, then the vacancy shall be filled by said parties jointly, if they agree, and failing to agree, then by the two remaining referees, and if they do not so appoint within ten days after a request in writing from either party so to do, then the vacancy may be filled by some judge, as hereinbefore provided.

Twenty per cent. of the expenses and compensation of the referees shall be paid by the party of the first part and eighty per cent. by the party of the second part unless the referees shall otherwise order. The notices herein required to be given may be given to the President or Secretary of the Western Union Telegraph Company or persons acting as such, and to the President, Secretary or Treasurer of the National Bell Telephone Company or of its successors, or persons acting as such officers.

It is however expressly agreed and further provided that the party of the first part, at any time after the receipt of actual notice of an actual reduction of rates in consequence of its default, as aforesaid, may in the manner above provided, on alleging and showing to the party of the second part, and upon their failure to join in a reference, as aforesaid, then upon showing to any of the judges above referred to that it did not receive and was not informed of the notices to appoint and the communication of such notice, above described, require and obtain, in the manner above provided, the appointment of a reference to consider any reduction thus fixed by default, and the referees thus appointed may, by award, in whole or in part, restore the former limitation on the power to reduce rates, which restoration shall take effect from the date of said award.

If, from any cause, a reference twice called for shall fail to produce a valid determination as herein contemplated upon the matter submitted or to be submitted, then the party aggrieved may have such relief or protection in a court of law or equity in the premises by a specific performance or otherwise, as such court can afford.

(6.) Telephones for speaking-tube purposes, that is, instruments to be used for speaking from one part of the licensee's premises or from one of his buildings to another analogous to the use of speaking tubes, or telephones to be used by institutions of learning for scientific purposes, or telephones for connecting persons and families for social or household purposes only, not connecting with any exchange or central office; and telephones which are not to be used in circuit with any exchange or central office, and are not rented together with lines owned by the party of the second part directly or indirectly or by any auxiliary organizations in which it is interested, may be put out either at lower rentals than the standard, or at a gross sum to be paid in one payment, according to the discretion of the party of the second part; and in respect of such telephones the royalty or bonus is to be twenty per cent. of the reduced rental or gross sum, less commissions actually paid as herein provided.

(7.) The party of the second part may increase the established annual rate either generally or upon telephones used for any particular purpose, or by any particular class of licenses, from time to time at its discretion, and such higher rates, while in force, shall be taken to be the gross rentals or royalties in respect of the telephones for which they are obtained.

(8.) The limitations on reductions herein contained shall not apply after the expiration of the patent of the United States No. 186,787, granted to Alexander Graham Bell, January 30, 1877, which patent will expire January 30, 1894, unless some other patents owned by the said party of the second part, or under which it has exclusive licenses, shall operate to control the use of all speaking telephones substantially as they are now controlled by the patents represented by the two parties hereto.

ARTICLE 3. (1.) In ascertaining rentals on which the royalty or bonus is to be paid to the party of the first part, there shall be deducted from the gross rentals the following commissions and allowances:

On telephones used in district or exchange systems owned in whole or in part by the second party, or by auxiliary corporations or organizations in which it is interested, an allowance or commission of thirty per cent.

On telephones taken by the first party for private lines as hereinafter provided, or used by the second party on its own lines or put out by it, by its own officers or servants for any use other than on district or exchange systems in which it is interested as aforesaid, twenty-five per cent.; and the party of the first part or those it represents, shall be allowed said abatement of twenty-five per cent. from the standard rentals upon telephones leased to it or them, except where contracts heretofore entered into by said party of the second part oblige it to pay such rate, or a higher rate of commissions to its present licensees.

Upon all telephones other than the foregoing, such rate of commission as shall actually be paid, not to exceed forty per

cent., except so far as existing contracts may call for higher rates.

ARTICLE 4. (1.) The party of the first part shall bear and pay twenty per cent., and the party of the second part eighty per cent. of all reasonable legal expenses incurred in ascertaining, investigating and determining, and in prosecuting and defending rights which the party of the second part may have, claim, or wish to acquire, pertaining to telephones or the right to use telephones, or to inventions used in telephones, and concerning patent rights which it or others may claim respecting the same, including expenses in suits and in proceedings in the Patent Office relating to such rights or to the collection of rentals or royalties on telephones. Expenses, incurred in whole or in part in respect to inventions or improvements which are or may be used otherwise than in telephones, shall be apportioned, and such part thereof as may be justly chargeable to the telephone interest shall be borne by the parties hereto in the proportion above stated, and such part thereof as shall justly be chargeable to other interests shall be borne by the owners thereof.

(2.) The party of the second part may, from time to time, acquire such inventions and improvements in telephones as it shall deem advisable, and may introduce such of them as it sees fit into the construction of telephones put out to its licensees, and to reimburse itself for the cost thereof, may charge an additional price to its customers beyond the price then previously charged, but such an increase shall not operate to increase the royalty or bonus payable to the party of the first part hereunder until said second party shall have been so reimbursed, unless said first party shall elect and assent to bear and pay twenty per cent. of such cost. Or if the party of the second part shall deem it advisable not to raise the price as aforesaid, then the party of the first part shall bear, pay and be charged with twenty per cent. of said cost actually and in good faith incurred and paid, and the party of the second part shall bear, pay and be charged with eighty per cent. thereof. *Provided*, that if such payments are for rights which extend beyond the duration of this contract, or which are to be applied to purposes other than telephonic, then only a *pro rata* proportion, according to time or the purpose for which they are used, shall be borne by said first party. *And provided further*, that if the purchase of any one patent calls for an absolute payment exceeding \$10,000, no portion of the excess over that sum shall be charged to the party of the first part, unless it shall consent (and full opportunity shall be afforded it to do so) or it be determined by the board contemplated in Article 2, or by some other competent tribunal, that it should be so charged in respect of such excess; and said board shall so determine if, or so far as they shall find that said purchase was prudently made for the benefit of the parties hereto. Said second party shall call for said reference, and the referees shall be appointed, and such proceedings shall be had in reference thereto as are provided in said Article 2, so far as they can apply; and the questions submitted by the notice calling for said reference shall be determined by the default of the party or the decision of the referees, as therein provided; and the determination so arrived at shall be final and conclusive upon the questions so submitted.

ARTICLE 5. (1.) The party of the first part, for itself and those it represents, as aforesaid, hereby grants to the party of the second part, as far as they or either of them have the legal power so to do, an exclusive license during the full terms for which patents thereon have been or may be granted, to make, to use, and to license others to make and to use in speaking telephones, call bells, and switches, and other appliances for use on telephonic lines, any inventions or improvements therein which it, or those whom it represents, as aforesaid, now own or control, in whole or in part, by contract or otherwise, under which it or they have the authority to grant such license, and whether already patented or not, and which the party of the second part shall not otherwise have the right to use; reserving however to the party of the first part, and those it represents, the right to use said inventions in switches, call bells, and appliances other than telephones in connection with the telephones which they are or may become entitled to use under this contract. Instruments or apparatus made under this license shall be deemed to be licensed only for the uses above named, and not for any other purpose.

(2.) And the first party further agrees to acquire any further inventions adapted to be used in connection with telephones which it may have the right to so acquire under existing contracts with George M. Phelps and Thomas A. Edison, and to license the second party under the same for use in telephones or on telephone lines, the second party agreeing to pay to said first party in reimbursements, whatever the said first party or those it represents may be required to pay therefor under the ninth, tenth, eleventh and thirteenth clauses of the agreement between Thomas A. Edison and the Western Union Telegraph Company, dated May 31, 1878, and whatever it may be required to pay said Edison under the contract between the same parties, dated May 12, 1879, and whatever it may be required to pay George M. Phelps in addition to his salary of \$3,300 therein referred to, to acquire his inventions under the contract between him and the Western

Union Telegraph Company, dated January 20, 1876, or a due and proportionate part thereof, in case said inventions shall also be applicable to uses and purposes other than telephonic, said licenses to be exclusive during the term of this contract, and to continue but not to be exclusive thereafter; the character and extent of such license shall be taken into account in arriving at a fair proportion of the actual cost thereof.

(3.) And if the parties of the first part shall hereafter acquire ownership or control as aforesaid of other inventions adapted to be used in connection with telephones, the second party shall have the right or license to use the same for telephonic purposes, and shall be bound to pay to the party of the first part the cost thereof, or a due and proportionate part of said cost. Such right or license shall be exclusive for telephonic purposes during the whole period of this contract, and shall continue, but shall not be exclusive after its expiration; the character and extent of such license shall be taken into account in arriving at a fair proportion of the actual cost thereof.

(4.) Said second party will pay on instruments, which shall be made by or for it, the royalties specified in Schedule A, hereby referred to and made part of this agreement, so far as the first party or those it represents shall be bound to pay the same under the contracts therein referred to, unless it may have the right to make and use such instruments irrespective of this contract and of the contracts referred to in said Schedule by reason of the invalidity of the patents therein referred to, or otherwise, in which cases it shall not be deemed to be acting under any license from the party of the first part or those it represents; but it hereby agrees to indemnify the party of the first part and those it represents for any such royalties it or they may be legally bound to pay by reason of any use by the party of the second part.

(5.) This contract shall operate as a release to the parties hereto, and those they represent, and their respective licensees and predecessors, for all claims for infringement of patents on which suits are now pending, in which said parties, or any of their licensees or predecessors are parties, and all claims for infringement of other patents or inventions owned or controlled by them, or either of them, growing out of, or based upon, the manufacture or use of telephones now used in territory to which this contract applies at once; but, as to telephones in territory to which it does not apply at once, it is not to operate as such release (and each party stands on its own right in such conflicting territory) until settlements are made and interests harmonized as hereinafter provided, or until the parties hereto agree that it shall operate as a release upon telephones in such localities, and in either of such cases it shall thereupon operate as a release in respect of telephones in such locality.

ARTICLE 6. Except as herein provided, the first party and the companies it represents agree to withdraw from the manufacture, rental and use of telephones.

ARTICLE 7. The party of the first part agrees to give assistance and co-operation in developing and extending the use of the telephones of the party of the second part; and that the party of the second part shall, during the term of this contract, and when in the judgment of the first party it shall not interfere with the enjoyment and use of the same by said first party for telegraphic purposes, have permission to build lines under any franchises, contracts, licenses, or rights of way enjoyed or controlled by the party of the first part, or to use any poles, fixtures, structures, or plant of said first party, upon reasonable terms, subject, however, to a revocation of such license to use any poles, structures, fixtures or plant, at any time, by reasonable notice to the party of the second part.

ARTICLE 8. Whereas it is intended as a part of this agreement that all telephones heretofore put out under lease or under license by and from the party of the first part and those it represents shall, without any exception (except temporarily where this contract does not at once apply), become the property of and come under lease and license from the party of the second part, and, when so transferred and placed under lease and license in accordance with the terms hereof, shall not be pursued or treated as infringing instruments in respect of any use thereof prior to the date of this agreement:

And whereas it is also intended that all telephone exchanges which have heretofore been established by the party of the first part or those it represents, or by or under contracts with them or some of them shall, together with their plant, be transferred to the party of the second part and become its property, and that all interests of the party of the first part or those it represents, whether as holders of stock or other interests in telephone exchanges or corporations or organizations owning or maintaining exchanges shall be transferred to the party of the second part and become its property, except in the localities named in section (5) of this article:

And whereas the party of the second part or its predecessors, owners of the Bell patents, have heretofore granted certain licenses, and made certain contracts, exclusive in their character to a certain extent, which may render it impracticable or improper for it to so accept and license some of said telephones and exchanges without the consent of the grantees of such previous licenses who are not parties hereto, and whereas the party of the first part, or those it represents, may not be legally able to transfer some of

said property or interests without the concurrence of third parties so that certain of the transfers desired cannot be made, or cannot be accepted and the intended licenses given until arrangements or modifications of contracts can be made with one or both the present licensees claiming conflicting rights (as may be necessary in each case), which will permit the transfers and licenses so intended and desired to be made and granted:

Now, therefore, it is agreed as follows:

(1.) In the places named in Schedule B, hereby referred to, and made part of this agreement, in which places it is understood that no such conflict exists, the exchanges and interests in exchanges owned by the party of the first part, or those it represents, and all the property connected with such exchanges, including contracts of the subscribers, and all telephones in said localities shall forthwith be transferred and delivered to and put under lease or license from the party of the second part and paid for by it as hereinafter provided, except that telephones which already belong to the party of the second part are not to be again paid for. All the interest owned by the Gold and Stock Telegraph Company in the American District Telegraph Company at Boston is to be included in the transfer provided for by this section.

(2.) In the places named in Schedule C hereby referred to and made part of this agreement, in which places it is understood that the party of the first part or those it represents are sole owners of all the exchanges established and all the telephones put out by or under it or them, but in which the party of the second part has granted licenses which may conflict as aforesaid, the party of the first part, and those it represents, will transfer all such exchanges and telephones to the party of the second part, who will accept and pay for said exchanges, and accept, pay for and license said telephones as herein provided, but the party of the second part shall not be required to take, pay for, and license the same as aforesaid, until opportunity has been afforded for the requisite arrangements to be made as aforesaid with its licensees, or it shall elect to accept, pay for, and license the same without waiting for such arrangements to be made.

(3.) This contract shall not operate upon nor affect the telephones and exchanges in the places specified in Schedule D until arrangements have been made with owners or part owners of exchanges therein who are not parties hereto, or until the parties hereto shall agree that it shall operate therein. But the provisions of sections (8) and (9) of this article shall apply to such localities. Upon the transfer of said interests the parties hereto, and those represented by them, will use their best endeavors to cause all telephones in said localities, which have been manufactured or furnished by or on behalf of the first party, or those it represents to be transferred to and put under license from the party of the second part as aforesaid, and the same shall thereupon be accepted, paid for, and licensed by said party of the second part as herein provided.

(4.) With regard to the price to be paid by the party of the second part to the party of the first part for instruments and all properties and interests to be transferred hereunder, it is agreed as follows: for the instruments specified in Schedule E, hereby referred to and made part hereof, there shall be paid the amounts therein specified respectively, or a proportional part thereof upon the delivery of a portion of said instruments less than the whole number specified, payment to be made upon delivery of the same as herein provided; and in renting such of said instruments as include a transmitter, call bell and switch, being the twenty-two kinds first named in said schedule, the party of the second part may charge a rent or price for the call bell and switch in addition to the standard rent of the telephone itself, and an amount of such additional rental not to exceed three dollars per annum for a period which shall yield an amount equal to nine dollars on each instrument shall be rated as applying to the call bell and switch in said instruments, and on this amount no royalty or bonus shall be paid to the party of the first part. In addition to the sums specified in said schedule the party of the second part will pay the royalties of twenty or twenty-five cents a switch which have been paid on switches included in said schedule and made under contracts with T. B. Doolittle or H. L. Roosevelt. All exchanges which the party of the first part or those it represents have established and own, and all interests, entire or partial, which are to be transferred hereunder, acquired by them in other exchanges or in corporations owning exchanges, are to be paid for when transferred at the actual cost to the party of the first part or those it represents, at the time of transfer, of establishing or purchasing the same, not taking into account any profits or losses in operating the same nor legal expenses in patent suits. Exchanges and exchange plant (which are to be paid for at actual cost), include wires, lines, poles, fixtures and other appliances, and also all call bells, batteries, switches and switch-boards which are in use or on hand fit for use, and are owned and paid for by the exchange, but where the telephone lines have been placed upon poles or fixtures erected for telegraph lines such poles and fixtures are not to be transferred, but the party of the second part may continue to use the same under and subject to the provisions of Article 7. In cases where the value, cost or price remains to be fixed or ascertained, if the same cannot be agreed

upon by the parties hereto, it shall be appraised, fixed or determined by two disinterested experts, one to be chosen by each party; and if the two so chosen cannot agree they shall choose a third, and the decision of the majority shall be binding upon the parties.

(5.) The undertaking of the party of the first part, and those it represents, to transfer all their interests in telephonic district or exchange systems, and corporations or organizations owning them, shall not be held to include the stock interests of said first party and those it represents in the "Philadelphia Local Telegraph Company," "The Central District & Printing Telegraph Company" of Pittsburgh, the "Gold & Stock Telegraph Company of California," the "Michigan District Telegraph Company" of Michigan, which companies have some interests in telephonic exchanges; nor to include their interests in the properties (other than telephones) in the exchanges within thirty-three miles of New York City Hall. The party of the first part and those it represents will, as soon as local conflicting interests can be harmonized, transfer to and put under lease and license from the party of the second part, upon its acceptance and payment for the same as herein provided, all telephones in said New York territory, and in the localities covered by the companies above mentioned, and will use their best endeavors to procure this to be done as soon as possible.

(6.) As to all telephones heretofore put out by the party of the first part or those it represents, for uses for which it or they are entitled to be furnished with telephones as provided in Article 14, they shall transfer the title in the same to the party of the second part, and thereupon shall receive leases and licenses for the same in accordance with this contract, and the party of the second part shall pay for such telephones as herein provided. In all cases where the party of the first part or those it represents are to be licensees of telephones now out and the title in which under the provisions hereof is to be transferred forthwith, they shall begin to pay the rental and royalty thereon and licenses shall issue as from the day this agreement takes effect, and at the present recognized standard rate until some other shall be established in accordance with the provisions hereof. But any such telephone which cannot be so transferred, accepted and licensed, by reason of conflicting or inconsistent rights heretofore granted by the owners of the Bell patents to their licensees, shall not be paid for nor shall the rent or royalty thereon begin until such conflicting interests can be harmonized as herein provided so as to permit such transfer, unless said second party shall elect sooner to take, pay for and license the same; and until such transfer the provisions of this contract shall not apply to any telephone so situated, and the party of the first part and those it represents shall, in the meantime, stand as they would have done with reference thereto had this contract not been made.

(7.) All telephones, as to the transfers of which special provision has not been hereby made, are to be transferred to and paid for by the party of the second part, and by it licensed directly to customers and users forthwith in the manner and with the effect herein provided, or as soon as practicable as aforesaid.

(8.) With respect to the telephones, and the telephone exchanges and properties and interests the transfers of which may be delayed by reason of conflicting claims or interests as hereinbefore provided, it is agreed that both parties will use their best endeavors and due diligence to arrange with their respective licensees and associates such modifications of existing obligations as will allow said transfer to be made at the earliest possible date. Until such time the parties of the first part will not transfer any of said properties (except so far as existing contracts may legally require them) to any person or party, unless approved by the party of the second part.

(9.) And the party of the first part, for itself and those it represents, agrees that previous thereto any of said exchange properties shall be transferred at said cost price, on request, to any party approved by the party of the second part, who shall not be a competitor in the telegraph business with the Western Union Telegraph Company, suitable provision first being made to protect from oppression the rights and interests of local and associate owners of the exchanges and exchange plant.

(10.) And said first party also agrees that suitable accounts, statements and information shall be seasonably furnished to the party of the second part, for the purpose of, or to assist in ascertaining the price to be paid for all properties and instruments which the party of the second part is to or may take and pay for under this contract.

(11.) Telephones which have been sold by the party of the first part, or those it represents, to institutions of learning and to the Government of the United States, shall be deemed to be licensed by the party of the second part, and shall not be made the basis of any claim for infringement.

ARTICLE 9. As to each locality named in Schedules C and D in which the transfer of the exchanges and telephones may be delayed, as provided in sections (2) and (3) of Article 8, and as to each locality mentioned in section (5) of said article in which the transfer of telephones may be delayed as provided in said article, and as to all telephones (not used on exchanges) in localities where the acceptance of telephones is delayed, as provided in (6) and (7)

of said article it is agreed, so far as the conflicting class may extend, that, until the time shall arrive for the transfer for such locality to be made as in said sections is provided, the parties hereto respectively, and the owners or users of telephones or telephonic appliances, claiming or holding under persons whose claims create the conflict and give rise to the delay shall not have the benefit of any immunity or protection from suits by reason of this agreement or anything done hereunder or in consequence hereof, unless and until the parties hereto shall otherwise determine by a writing hereafter to be made; and nothing herein contained shall operate directly or indirectly, expressly or impliedly, as a license to any such person or party to use telephones or telephonic appliances within such locality, nor shall it in any way interfere with or affect the obligations which the parties to this agreement may be under respectively to their said licensees, or with any rights of the first party to supply telephones in such conflicting territories as provided in Article 11. No royalty or bonus shall be paid in respect of telephones used within such localities and not entitled to the protection hereof, unless actually accepted and licensed as provided in Article 10.

ARTICLE 10. (1) All telephones and apparatus which are to be taken, paid for and licensed by the second party hereunder shall be placed under written leases and licenses from it, in such form and at such rentals as said second party shall establish under the provisions of this contract, not different from those at the same time established for other telephones used for like purposes; and the transfer shall not be deemed to be complete nor shall the second party be required to accept, pay for, or license any instrument until it shall be pointed out, ear-marked, and such delivery made of it as the nature of the case will permit. No telephone shall be deemed to be accepted and licensed under the patents of the party of the second part, nor shall any person be entitled to any immunity whatsoever from claims for infringement of any patent by reason of the manufacture or use of such telephone, nor shall it be required to be paid for by the party of the second part until it shall be so delivered and put under written lease or license hereafter to be made, or delivered into the actual possession of the party of the second part, or shall be designated, ear-marked and offered to be put under such lease and license by the parties entitled so to do, including the party in actual possession and the party undertaking and bound to pay rental and royalty therefor. When any telephone shall be so accepted, leased and licensed; or shall be so offered within three months from the date hereof, and, under the provisions of this contract, be required to be accepted and paid for, its manufacture and use, prior to such time, shall not be made the basis of any claim for infringement of any patent.

(2) But the second party may, at any time it sees fit, after the expiration of six months from the date hereof, take from the party of the first part or those it represents any existing telephone (except those which the party of the first part or those it represents are entitled to have and use under the provisions of Article 14, and those which under Article 9 are temporarily excepted from the effect of this contract), with the existing license or contract for license for the same with all the rights of the owner or licensor, by a written notice to that effect given to the party in actual possession of the telephone, and also to the party of the first part, and thereupon it shall be entitled to receive the rental and royalty therefor, and be bound to take and pay for the same as herein provided; in such cases the bonus or royalty to be paid to the party of the first part under Article 1, during the continuance of such existing lease and license, shall be 20 per cent. of the rental actually received under the terms thereof; and in respect of all rights and interests transferred as provided in this article, said second party may, so far as necessary, but at its own expense, use the name of the first party or those it represents, to maintain and enforce all the rights and interest legally or equitably coming to it upon or by such transfer.

(3.) The rental of the telephones transferred or required to be transferred to the party of the second part hereunder shall, from the time such transfers shall be or ought to be made, accrue to and be collected by said second party, subject to the payment and allowance of the royalty, bonus, and commissions hereinbefore provided; when all such transfers have been made, and the conflicting interests of the respective licensees shall have been so far harmonized as to enable said first party to cease to manufacture and supply telephones as provided in Article 11 then said second party will receive and pay for all the remaining property belonging to said Gold and Stock Telegraph Company and American Speaking Telephone Company, of the character specified in Schedule E, at the prices therein stated. All telephones made for use after November 1, 1879, are to be paid for at actual cost when transferred.

ARTICLE 11. (1.) The first party reserves all such rights as it now possesses to continue to manufacture and supply its own telephones, notwithstanding the stipulations of this contract, to its own exchanges already established and in actual operation and subscribers thereto, and to its licensees, until the local conflicting interests between the respective licensees of the two parties hereto can be harmonized and until any property of said first party at such places shall be turned over to said second party and paid for, as hereinbefore provided; but said first party shall organize

no new exchanges, nor grant any new or additional licenses (except to additional subscribers to exchanges already established) creating new or additional conflicts or complications except within the radius of thirty-three miles from New York City Hall, and within the territory covered by the Ormes contract herein-after referred to; and such places where such conflicting interests of licensees exist shall, until they can be so harmonized, be exempt from the operation of this contract as aforesaid.

(2.) But it is distinctly understood as an essential feature of this contract that all the telephone district or exchange systems except those within the radius of thirty-three miles from New York City Hall, and within the territory covered by said Ormes contract, are to be transferred to and accepted by the party of the second part at the earliest possible day, and that their continuance in the hands of the party of the first part during the meantime, is merely to give an opportunity for local interests to become harmonized and to avoid inconvenience to the public, and not as a source of revenue or advantage to the party of the first part or those it represents.

ARTICLE 12. (1.) The right to all uses of the telephone on wires of a district or exchange system is to remain exclusively with the party of the second part, excepting such temporary suspension of the application of this contract to certain localities, as has been already herein provided for.

(2.) For the purpose of this contract it is agreed that an "exchange," or "a district or exchange system" applies to a system in which different stations on the same or different circuits, and either within any city or town or within a radius of fifteen miles of a central office (or within wider limits, where existing contracts have granted wider limits), are connected with such central office or branch offices within said territory for the purpose of placing subscribers or other parties by such circuits in communication with such central or branch offices or with each other, either directly or through the agents of the system.

ARTICLE 13. (1.) The right to connect telephonic district or exchange systems for the purpose of personal conversation between persons at the instruments, and the right to use telephones on all lines not forming a part of a telephonic district or exchange system for such personal conversation (except so far as licenses for private lines are to be granted to the party of the first part under Article 14) are to remain exclusively with the party of the second part, and those licensed by it for the purpose. But such connecting and other lines are not to be used for the transmission of general business messages, market quotations, or news for sale or publication in competition with the business of the Western Union Telegraph Company, or with that of the Gold and Stock Telegraph Company. And the party of the second part, so far as it lawfully and properly can prevent it, will not permit the transmission of such general business messages, market quotations or news for sale or publication over lines owned by it, or by corporations in which it owns a controlling interest, nor license the use of its telephones or patents for the transmission of such general business messages, market quotations or news for sale or publication in competition with such telegraph business of the Western Union Telegraph Company or that of the Gold and Stock Telegraph Company.

(2.) The terms "general business messages" and "telegraph messages," or "messages for hire," are defined to mean all communications in behalf of other parties than those who directly communicate by the telephone by themselves or their servants or agents personally present at the instruments; and no person engaged in the business of transmitting messages for other parties shall be authorized or knowingly allowed by the party of the second part, or its servants or agents, to transmit such messages through the telephone.

(3.) It is, however, understood, that the stipulations of this contract relating to the transmission of telegraph messages shall not operate to restrain the renting of telephones by the party of the second part to railroad companies for strictly railroad messages, or for general business messages in connection with the Western Union Telegraph Company or its auxiliary corporations or organizations, nor so as to restrain, impair or affect the right of the party of the second part to use telephones by themselves or their licensees for all purposes in territory not occupied or covered by the Western Union Telegraph Company or its auxiliary corporations or organizations, nor from contracting with the Northwestern Telegraph Company and other companies as to territory not occupied or covered by the Western Union Telegraph Company or its auxiliary corporations or organizations at the time such contracts or licenses are made, or with the Government for lines in the Territories, or for Government lines for Government messages in the States. For the purposes of this contract the Western Union Telegraph Company is deemed to occupy and cover all the thirty eight States of the United States, the District of Columbia and the Territories of Washington and Utah, except the Territory of the Montreal Telegraph Company, to wit, that part of the State of New York which is west of Lake Champlain and north of a line drawn from Whitehall to Oswego, and except the territory of the Northwestern Telegraph Company, to wit, the State of Wisconsin (except the line between Chicago and Milwaukee), the State of Minnesota, that part of Iowa which is North of Sioux City, and the upper peninsula of Michigan, and

except all that part of Florida which is not reached by the lines of the International Ocean Telegraph Company or of the Western Union Telegraph Company.

(4.) The party of the second part will not knowingly grant any license to use telephones for any purpose for which it agrees not to use them as specified in this article, and it will insert in all its licenses, such apt and suitable restrictions as under the advice of counsel are deemed reasonable and proper to that end and upon notices of any breach thereof will use all reasonable means to enforce the performance and observance of the same. But it is understood that the party of the second part is not to be held responsible for any breach of the stipulations of this article and article 15 of this contract not committed by its officers or servants unless it had reasonable notice and failed to use reasonable means to prevent it.

(5.) The whole expenses of litigation, if any shall arise with third parties in consequence of the stipulations of this article relating to the transmission of general business messages, market quotations or news for sale or publication, or acts in pursuance thereof, or attempts to enforce the same, shall be borne by said Western Union Telegraph Company. Said last-named company shall also have the control of all such of said suits as do not bring in question the validity, construction, or effect of, or title to, the patent rights of the party of the second part, or any of them, whether held by ownership or license, and for that purpose it shall be the duty of said second party to give due authority to such counsel and such attorneys in law or in fact, as the Western Union Telegraph Company may nominate to institute, appear in and conduct such suits, in the name of the second party if necessary.

ARTICLE 14. (1.) The party of the second part will fully license the party of the first part to use telephones procured from it for transmitting telegraph messages, and for use on private lines, with the right to sublet the use thereof along with such private lines, for such purposes as such private lines have been and are being used, except in territories where exclusive agency contracts inconsistent with this agreement to license already exist, and during the continuance of such agencies, in which cases they may obtain them from such agents.

(2.) For the purposes and uses aforesaid, the party of the first part shall be furnished with telephones, with licenses from the party of the second part to use such telephones and other inventions owned or controlled by it for use in connection with telephone lines, on terms which may be established from time to time, and which shall be as favorable as those on which they are furnished to any other parties for like uses, and shall be allowed a discount as provided in Article 2.

(3.) The party of the second part shall have the right from time to time to incorporate in its leases and licenses such apt and suitable stipulations as it may deem requisite for the control, preservation, and protection of its telephones in the hands of licensees, to secure the payment of royalties and rentals, to protect itself against the application and use of telephones for uses different from those for which they are rented or licensed, and to aid it in protecting the patents owned by it or under which it has licenses, and its title thereto, from infringement or attack, and it may prescribe and require the party of the first part to incorporate such stipulations into all licenses, leases and sub-leases of telephones, granted by it; but no stipulations shall be incorporated in the licenses and leases to the party of the first part or prescribed as aforesaid, for the licenses and leases to be granted by it, different from those in use for other licenses for like purposes.

(4.) For the purposes of this contract "private lines" are understood to refer to telephone lines, each consisting of a single circuit on which telephones are to be used for the individual and private business of the individuals, business firms, or corporations leasing the same. Such telephones are not to be used by any other parties than those leasing them, except on business of the parties so leasing, nor is any business to be transacted by or through them for a consideration or toll to be paid by other persons than those so leasing them. Such private lines or circuits shall not extend more than twenty-five miles beyond the municipal limits of the city or town in which one end of the line is situated, nor shall any one line or circuit be used for more than two individuals, firms, or corporations at each end, nor shall any two or more lines or circuits be connected.

ARTICLE 15. (1.) The second party will turn over and deliver to the Western Union Telegraph Company of the first part, or its agents, exclusively, all messages for transmission to other points by telegraph, collected by or coming on the wires or within the control of its telephonic exchanges or district systems or those of its licensees, wherever the first party has wires and is prepared to receive or transmit the same, so far as said second party can lawfully control the same, and unless otherwise specially directed by its customer; but will not solicit such special direction nor receive and pay tolls for transmission over other lines, unless compellable by law so to do. And the first party shall forward the same to destination, subject to its established rules and regulations, upon payment of regular tolls, and pay to said second party a commission of fifteen per cent. on all the tolls received for transmitting such messages over its lines; the commission not to include tolls for the transmission over other lines, nor tolls for transmitting

cable messages. For delivery service of telegraphic messages made through said second party or its licensees, and for collecting through a messenger service for delivery to said Telegraph Company, the party of the first part will pay a fair compensation, the same that is paid to district telegraph companies for similar services.

(2.) If the second party, for the purpose of doing a general telegraph or telephone business, shall connect a telegraph station of the Western Union Telegraph Company by a branch line, with any place in territory occupied or covered by the Western Union Telegraph Company which has no Western Union line or office, it shall turn over and deliver to the Western Union Telegraph Company, exclusively, so far as it has legal power to control the same (unless it be specially directed by the customer sending the same that they be forwarded by some other route,) all messages collected from such points so connected. And said Western Union Telegraph Company will, as hereinafter provided, receive, and forward the same upon payment of regular tolls, and pay to the second party or its agents a commission of ten per cent. upon the tolls received for transmitting such messages over the Western Union Telegraph lines (cable messages excepted from such commission); and there shall be added to the rate of tolls to be collected from customers a further rate not exceeding ten cents per message of ten words on such branch lines of the length of ten miles or less, and five cents additional per message of ten words for each additional ten miles or fraction thereof in length of said branch lines, and at the same rate for longer messages; such tolls so added shall belong to the party of the second part.

(3.) When the second party shall have constructed such branch lines to such new points within the territory occupied or covered by the Western Union Telegraph Company, but not theretofore reached by its telegraph lines, and the telegraph company of the first part shall thereafter elect to construct its lines of telegraph to such new points, it shall, if required by said second party, take and pay for the lines of the second party at cost, and also pay said second party the commission provided in section (2) of this article on all the business taken at such point for the period of twelve months thereafter. But if the party of the second part shall elect to keep its own lines, the provisions contained in Article 13, against the transmission of general business and other messages, shall apply to such line.

(4.) Where any messages are to be delivered between the parties through the telephone, said party of the first part is to afford to the party of the second part, at the expense of the second party, the facilities for providing a telephone connection between its office and the office of the district exchange or branch line, and shall at its own office, without further cost to the party of the second part or its licensees, receive or transmit said messages over said connecting line by its own clerks, who for that purpose shall be the agents of the second party and subject to its rules and regulations.

(5.) It is also agreed by the party of the first part, for itself and those it represents, that it will not connect its telegraph lines with any telephonic district or exchange system other than those licensed by the party of the second part, so far as it lawfully can refrain from so doing, except in districts and during the time temporarily excepted from the operation of this contract.

(6.) All messages or communications of customers delivered by either of the parties to the other for further transmission over its telegraph or telephone lines, as the case may be, shall be deemed to have been delivered and received subject to such established rules, regulations and conditions of the receiving company as may have been established and promulgated by it for the government of its business and not otherwise; and for the purpose of regulating and limiting the responsibility of the party receiving from the other a message or communication in this manner, it shall be the duty of the company receiving the message directly from the customer to require his assent to such rules, regulations and conditions of the other company by writing his message or communication upon the regular contract blanks of such company, or blanks containing an equivalent contract, or in such other manner as may be generally required by such company for that purpose from its direct customers; and if either company, dealing with the customer in the first instance shall fail in the duty last above stipulated, it shall hold the other company harmless from all claims for damage which it may be compelled to pay to the customer because of the absence of a contract arrangement with such customer subjecting the business in question to such established rules, regulations and conditions of the company thus rendered liable to the customer; the object of this stipulation being to limit the responsibility of each party to matters happening upon its own lines, and to secure the regulation of that responsibility in respect to all business originating beyond its own lines, in the same manner as such responsibility shall be regulated in respect to business beginning, continuing and terminating upon its own lines. Whenever any such rules, regulations or conditions shall be established or modified by either party the same shall be notified to the other party.

ARTICLE 16. The existing suits and interferences shall be disposed of as counsel of the parties of the first and second part may advise, to recognize and protect the rights of the several inven-

tors to their respective inventions, subject to the orders of the courts and the decisions of the Patent Office.

ARTICLE 17. This contract shall go into effect as of the first day of November, 1879, and shall be and remain in force until the expiration of seventeen years thereafter. It shall cover the whole territory of the United States, except that included in the Ormes contract (which territory shall be included in this contract upon the expiration of said Ormes contract), and those conflicting localities hereinbefore referred to and temporarily excepted, and shall cover them as soon as those exceptions expire. Said Ormes contract is a contract dated August 26, 1879, to which James M. Ormes, the Western Union Telegraph Company acting for the same parties as in this contract, and the National Bell Telephone Company are parties; the territory covered by it is as follows: West Virginia south of the Baltimore and Ohio Railroad, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama. For the further contents of said contract, so far as is material, reference thereto is hereby made.

ARTICLE 18. (1.) The party of the second part shall keep in regular books for that purpose, accounts of the number of telephones manufactured, licensed, and put out for use in the United States, and also of the rentals received and commissions or allowances paid or allowed as herein provided and of the number manufactured and sold in foreign countries and the amount received therefor. And said accounts shall, at regular quarterly intervals and at all reasonable times be open to inspection by the party of the first part, for the purpose of ascertaining the royalties or bonus due hereunder, and of verifying the accounts rendered, and copies of said accounts shall be rendered at the time of the quarterly accounting. Tolls collected by the one party for the other, and commissions on telegraph business, shall be paid monthly at the place where business is exchanged. All accounts for royalties, and all other unsettled accounts shall be settled, and the balance paid on the first day of February, May, August and November, up to the first day of the preceding month. All such accounts shall be verified by oath of the person having the best knowledge of the facts. Payments of the balances resulting from such accounts shall be made to the treasurer of the Gold and Stock Telegraph Company as representative of the party of the first part, or the treasurer of the second party, as the case may be, or such other persons in Boston or New York as the respective parties may from time to time appoint. Such persons shall have authority to settle all said accounts, and to receipt for the money.

(2.) The party of the first part or its said representative is to be promptly notified of all reduction of rentals.

ARTICLE 19. It is understood and agreed that nothing herein contained shall be construed as imposing upon either party any obligation to do or not to do at any time anything contrary to law; and if anything herein covenanted or contemplated to be done or not to be done shall be or become contrary to the law of the land, the consequent inability and failure to perform the same shall not operate as a dissolution of this contract, nor to give to either party a right of action against the other.

ARTICLE 20. All the provisions and stipulations herein contained and described as incumbent on or for the benefit of the parties hereto, shall be incumbent on or for the benefit of their respective successors or assigns.

IN WITNESS WHEREOF said Western Union Telegraph Company hath caused these presents to be subscribed by its President, and its corporate seal to be hereto affixed by its Secretary, and said National Bell Telephone Company hath caused its corporate seal to be hereto affixed by its Clerk and these presents to be subscribed by its President and Treasurer on the day first above written.

THE WESTERN UNION TELEGRAPH COMPANY,
By NORVIN GREEN, *Pres't.*

Attest,
A. R. BREWER,
Sec'y.

THE NATIONAL BELL TELEPHONE COMPANY,
By W. H. FORBES, *Pres't.*
GEO. L. BRADLEY, *Treas.*

Attest,
CHAS. EUSTIS HUBBARD,
Clerk.

The above-named Gold and Stock Telegraph Company, American Speaking Telephone Company, and Harmonic Telegraph Company, hereby acknowledge the authority of the Western Union Telegraph Company to represent and act for them in the matters embraced in the foregoing contract, and agree to be bound by and to carry out its provisions, it being understood and agreed by and between said named parties that the royalty and bonus upon telephones, herein provided to be paid to the said Western Union Telegraph Company, shall be paid to the said

Gold and Stock Telegraph Company for the use and benefit of said American Speaking Telephone Company.

IN WITNESS WHEREOF said parties have severally caused these presents to be subscribed by their respective Presidents, and their corporate seals to be hereto affixed by their respective Secretaries on the day of the date of said contract.

THE GOLD AND STOCK TELEGRAPH COMPANY,
By GEORGE B. PRESCOTT, *Vice-Prest.*

Attest,
J. D. REID,
Sec'y.

THE HARMONIC TELEGRAPH COMPANY,
By E. W. ANDREWS, *Prest.*

Attest,
H. H. DUNCKLEE,
Sec'y.

THE AMERICAN SPEAKING TELEPHONE COMPANY,
By NORVIN GREEN, *Vice-Prest.*

Attest,
J. D. REID,
Sec'y.

SCHEDULE A.—The royalties which are referred to in (4) of Article 5 are :

A royalty of twenty cents per switch under a contract between the Western Union Telegraph Company and Thomas B. Doolittle, dated June 14, 1879, relating to said Doolittle's patent, No. 209-115, granted October 22, 1878. The Western Union and Gold and Stock Telegraph Companies have, under said contract with Mr. Doolittle, made and paid him royalty on upwards of 5,000 of these switches.

A royalty of twenty-five cents upon each telephone embodying any of the inventions or improvements covered by the patent No. 218,582, granted to Sidney H. Short, August 12, 1879, under contract between the Gold and Stock Telegraph Company and said Short, dated August 23, 1879.

A royalty of twenty-five cents on each automatic switch which shall be made or used by the party of the second part, under H. L. Roosevelt's patent, No. 215,837, of May 27, 1879, by virtue of the license contained in Mr. Roosevelt's letter to Mr. George B. B. Prescott, dated June 21, 1879.

The party of the second part does not hereby admit the validity, effect, or value of any of said patents.

SCHEDULE B.—Places where the Western Union Telegraph Company or the Gold and Stock Telegraph Company have established exchanges or leased telephones, and the owners of the Bell patents have granted no exclusive rights to other parties, or where the Western Union Telegraph Company or Gold and Stock Telegraph Company have bought the Bell licenses, or interests therein.

No hostile interests are here to be reconciled, and the transfers may take place at once.

1. Places where exchanges were established and are owned by the Western Union Telegraph Company, and on which the telephones of the American Speaking Telephone Company are used: Atchison, Kan.; Akron, N. Y.; Auburn, N. Y.; Boston, Mass.; Chester, Pa.; Concord, N. H.; Danville, Ill.; Decatur, Ill.; Davenport, Iowa; Defiance, Ohio; Evansville, Ind.; Galveston, Texas; New London, Conn.; Houston, Texas; Kansas City, Independence, Mo.; Lafayette, Ind.; Leavenworth, Kan.; Little Rock, Ark.; Moline, Ill.; Meriden, Conn.; Pekin, Ill.; Pittsfield, Mass.; Portland, Me.; Providence, R. I.; Pawtucket, R. I.; Rock Island, Ill.; Richmond, Ind.; Rutland, Vt.; S. Norwalk, Conn.; Springfield, Ill.; Stamford, Conn.; St. Louis, Mo.; Topeka, Kan.; Washington, D. C.

Places where the Western Union Telegraph Company has acquired a part or the whole of the interest of the Bell licensees: Bridgeport, Conn., the whole; Columbus, Ohio, the whole; St. Louis, Mo., majority interest; Providence, R. I., Pawtucket, R. I., majority interest.

The Gold and Stock Telegraph Company own the telephone exchange in Boston. The stock owned by the Gold and Stock Telegraph Company in the American District Telegraph Company of Boston, is to be transferred with the Boston Exchange.

SCHEDULE C.—Places where the Western Union Telegraph Company, or the Gold and Stock Telegraph Company have established and own exchanges, or have leased telephones, and where the owners of the Bell patents have granted rights to other parties under which those other parties might object to the use of the telephones put out by the Western Union Telegraph Company, or the Gold and Stock Telegraph Company. In these cases, the Western Union Telegraph Company, or the Gold and Stock Telegraph Company could transfer at once, but the interests or obligations of the National Bell Telephone Company require that it

shall have an opportunity to arrange with those licensees. Bloomington, Ill.; Dayton, Ohio; Fort Wayne, Syracuse, N. Y.; Fayetteville, N. Y.; Fall River, Mass.; Hartford, Conn.; Indianapolis, Ind.; Keokuk, Iowa; Lockport, N. Y.; Manchester, N. H.; New Haven, Conn., Niagara Falls, N. Y.; Norwich, Conn.; Peoria, Ill.; Rochester, N. Y.; St. Joseph, Mo.; Tonawanda, N. Y.; Trenton, N. J.; Cincinnati, Ohio.

SCHEDULE D.—Places where exchanges have been established, and have used telephones furnished by the Gold and Stock Telegraph Company. (1) Exchanges in which the Western Union Telegraph Company owns a stock interest: Albany and Troy territory, N. Y.; Newburg, N. Y.; Worcester, Mass.; Springfield and Holyoke, Mass.; Cleveland, Ohio; Erie, Pa. (American District Co.); Louisville, Ky. (contract made but no instruments furnished); Denver, Col.; Central City, Col.; Black Hawk, Col.; Golden, Col.; Georgetown, Col.; Leadville.

(2) Exchanges established and using telephones furnished by the Gold and Stock Telegraph Company, but in which neither the Western Union Telegraph Company nor the Gold and Stock Telegraph Company have any interest. Buffalo and Williamsville, N. Y.; Chicago, Ill.; Dubuque, Iowa; Des Moines, Iowa; Milwaukee, Wis.; Toledo, Ohio; Lawrence, Mass.; Quincy, Ill.; Utica and suburbs, N. Y.; Poughkeepsie, N. Y.; Camden, N. J.; Wilmington, Del. *Memo.* The owners of the Bell patents have granted licenses, or made agency contracts for the Albany and Troy district, Worcester, Springfield and Holyoke, Cleveland, the six towns in Colorado, Buffalo and Williamsville, Detroit, Milwaukee.

SCHEDULE E (not printed here) comprises a list of Phelps, Edison, Bergmann, Gray and other styles of receivers and transmitters, etc., several thousand pieces of apparatus being thus transferred at various prices approximating cost of manufacture.

The agreement as above accepted, signed and sealed bears date of Sept. 27, 1879, was approved by the National Bell stockholders on October 24, 1879, and the directors on November 12. It was approved by the Executive Committee of the Western Union Telegraph Co. on November 12, 1879; the directors of the Gold & Stock Telegraph Co. on November 10, 1879; the directors of the American Speaking Telephone Co. on October 30, 1879; and the directors of the Harmonic Telegraph Co. on October 23, 1879.

GENERAL TELEPHONE PROTECTIVE ASSOCIATION.

A meeting of the above Association—the same as has been referred to in previous issues as the Eastern Telephone Protective Association—was held in New York on August 20th, when the organization was completed. The object of this association is to protect its members and their customers from any and all suits that may be brought against them for infringement of the Berliner patent No. 468,569; and the further object of this association will be to reduce the cost of telephone service to the public. The association is now composed of sixteen members. Mr. A. F. Stanley, of Stanley & Patterson of New York is secretary, and also a member of the executive board composed of four members. All the members who have joined so far represent manufacturing companies East of Pittsburgh. The association will immediately employ counsel to go to Boston, to watch the case of the American Bell Co. vs. the National Telephone Mfg. Co., and to assist in whatever way possible in the defence of the Century Telephone Co. and the Bay State Telephone Co., who have also been sued by the American Bell Co.

MUNICIPAL TELEPHONE CRAZE IN OHIO.

A special dispatch of Aug. 18 from Cincinnati says:—Following the craze for water works and electric lights, the smaller cities of Ohio and Indiana are now putting in telephone exchanges. It is a new system, and the city puts in and owns the plant. Chillicothe, Ohio, a town of 16,000 population, has, within a fortnight, completed its plant, and it is working splendidly. The Bell Company left the field. The new company rents the telephones to private residences for \$18 a year, while business houses pay \$24. The following is the estimated cost of operating the plant, 200 telephones being in operation: Construction of telephones, \$10,000; income, 150 telephones, at \$18 per annum, \$2,700; 50 at \$24, \$1,200.

FORTY MILES OF SHEEP RANCH TELEPHONY.

The Clark Brothers, whose sheep ranches extend from the Teton river to Birch creek, Mont., a distance of 40 miles, contemplate putting in a telephone extension from a point six miles west of Dupuyer through the latter place on to Pondera, connecting with Fairfield & McCuaige's two ranches, the three ranches of C. R. Scoffin and the two ranches of John Joiner. At Pondera connection will be made with Great Falls. The extension for which the money has already been subscribed will be about