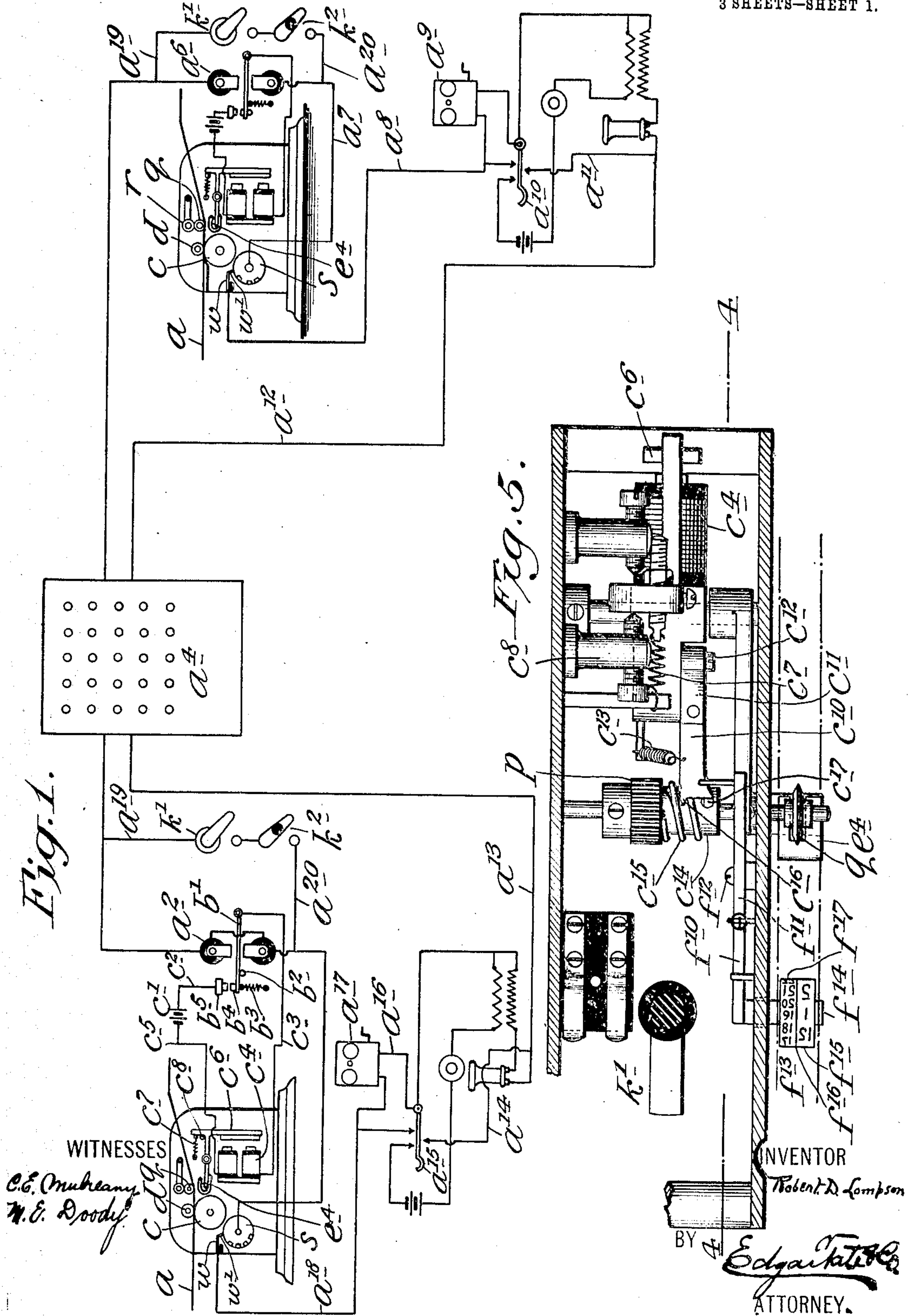


R. D. LAMPSON.
TELEPHONIC RECORDING APPARATUS.
APPLICATION FILED DEC. 6, 1907.

916,458.

Patented Mar. 30, 1909.

3 SHEETS—SHEET 1.

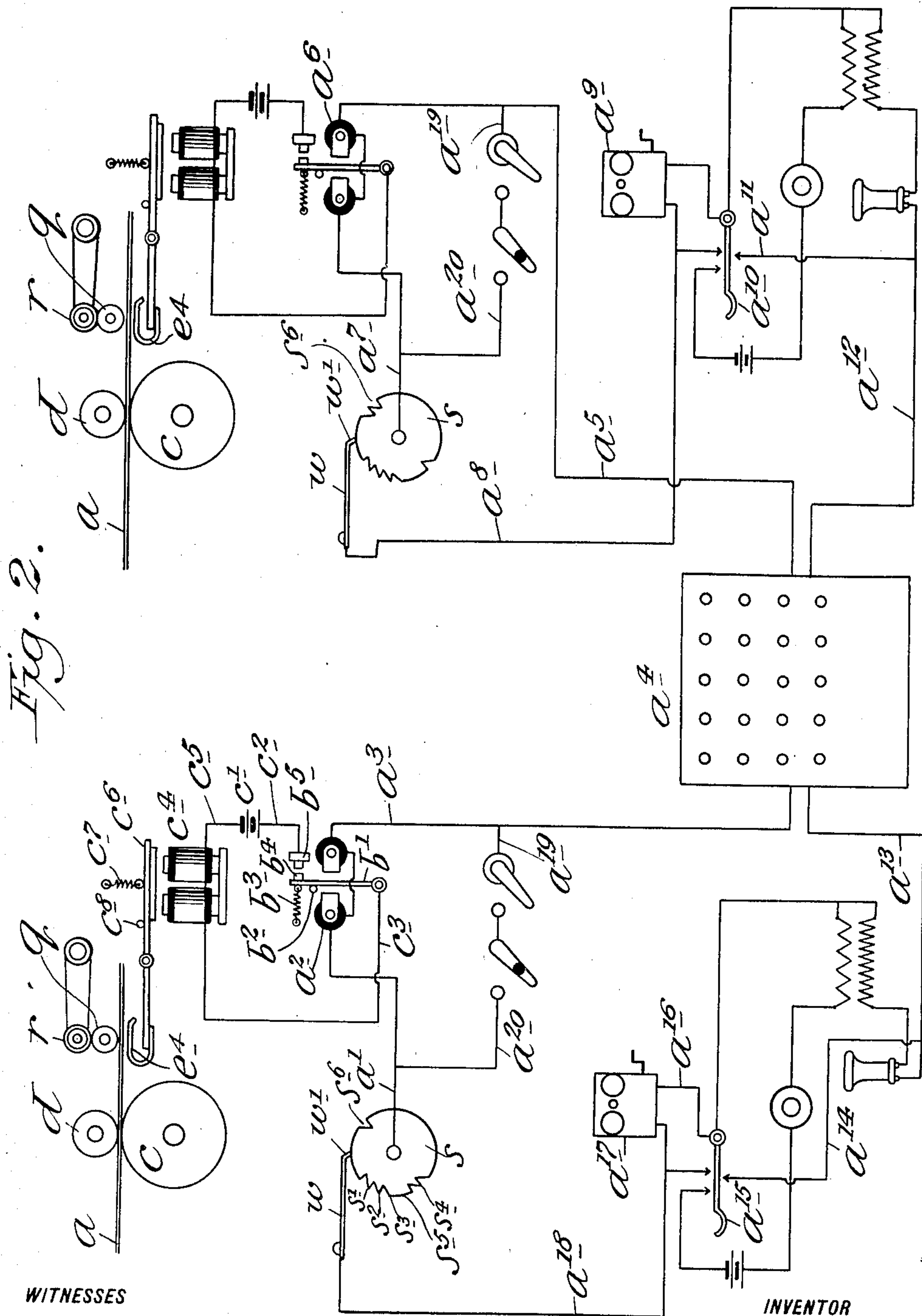


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WITNESSES

C. E. Mulreany
M. E. Doody

INVENTOR

BY

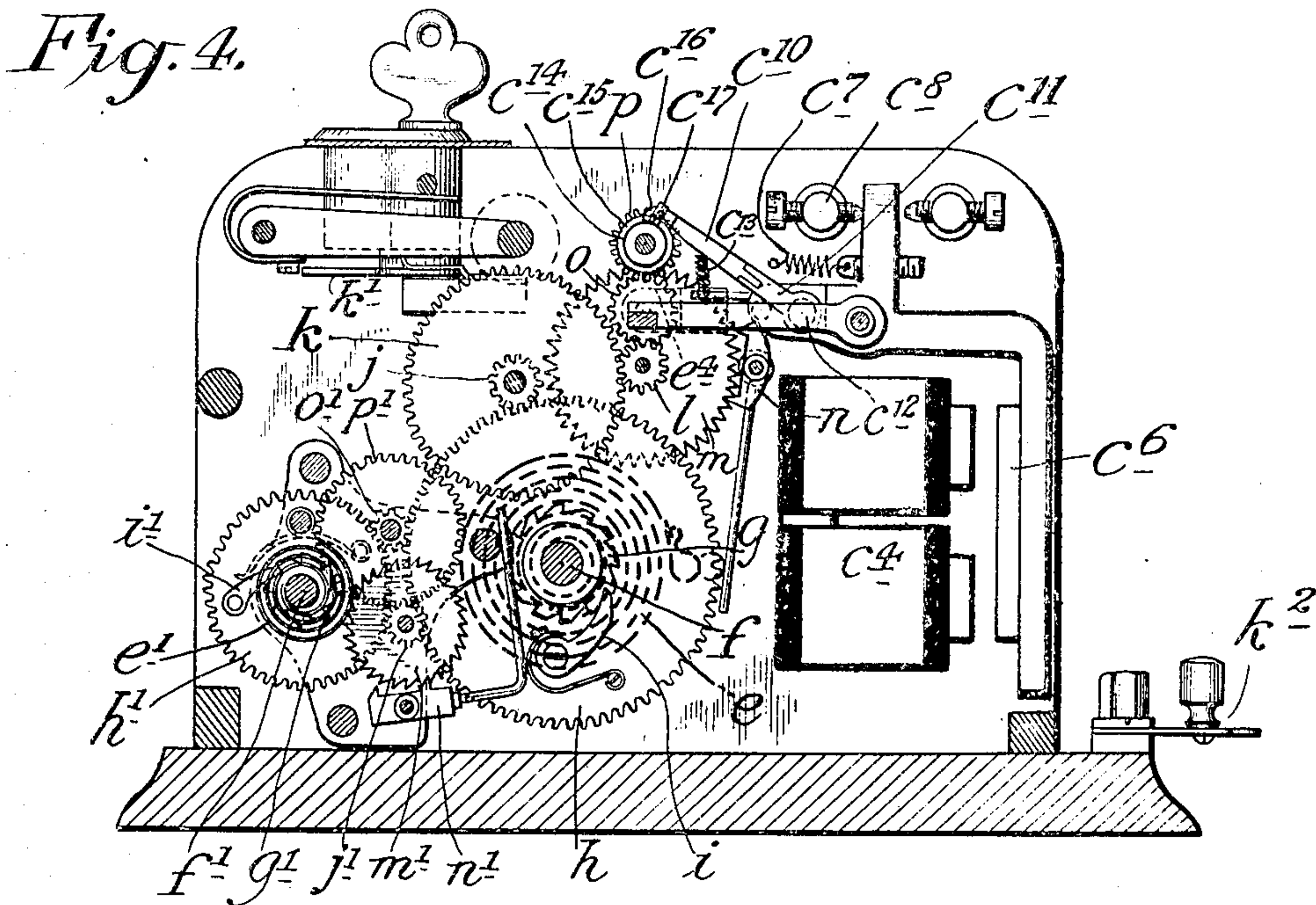
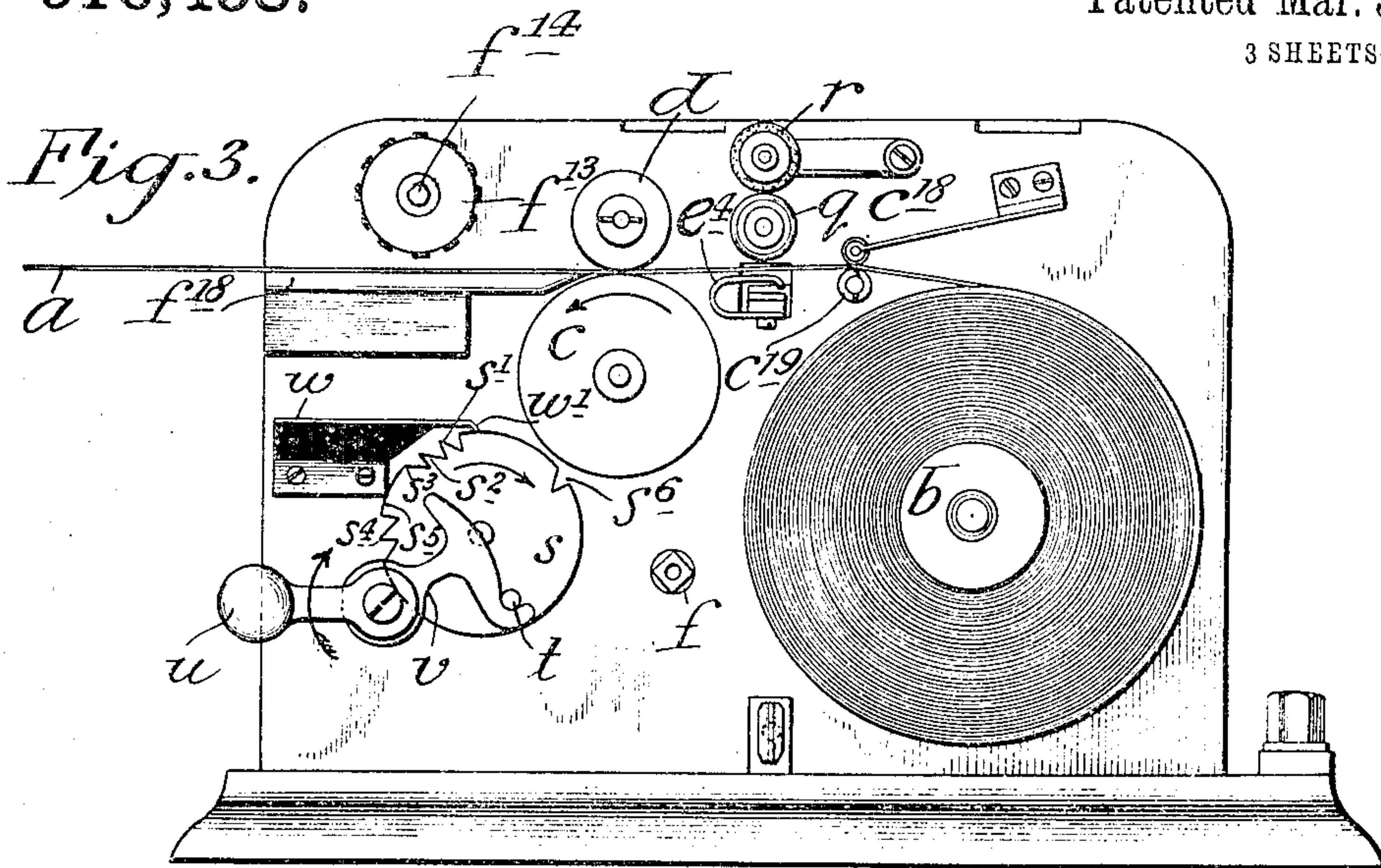
Robert D. Lampson.
Edgar Tate & Co.
ATTORNEYS.

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WITNESSES:
C. E. Mulreany
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UNITED STATES PATENT OFFICE.

ROBERT D. LAMPSON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO JOHN H. THOMPSON,
OF NEW YORK, N. Y.

TELEPHONIC RECORDING APPARATUS.

No. 916,458.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed December 6, 1907. Serial No. 405,374.

To all whom it may concern:

Be it known that I, ROBERT D. LAMPSON, a subject of the King of Great Britain, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telephonic Recording Apparatus, of which the following is a specification such as will enable those skilled in the art to which it appertains to make and use the same.

My improvements in telephonic recording annunciators relates to that class of apparatus adapted to the recording of electro telegraphic messages, and has particular reference to the adaptation of such apparatus in connection with a system of electrical distribution, employed in the communication of intelligence, when connected up with a central station, and principally the present method of establishing telephonic communication now in vogue.

The object of the invention lies in the adaptation and construction of an electro telegraphic recording apparatus, which will announce a call in the event of the absence of an attendant at the station signaled through a system, for example of telephonic communication, and it is the further object of this invention to record sufficient information at the absented station to enable the attendant to ascertain the identity of the station which transmitted the alarm or signal as well as the time of the sending of such signal.

In reducing my invention to practice my attention was directed to a type of printing telegraphic apparatus which has been in vogue in connection with fire alarms and messenger call systems whereby records are made upon strips of paper tape actuated by suitable motor mechanism, whereby upon the operation of the tape and the control of the printing mechanism the intelligence of a signaling station is communicated through a series of interruptions or changes in the electrical circuit involving the transmitting and receiving apparatus, and to this end I have adapted an electrical circuit, which may be completed at the central station of a telephonic system between two connected subscribers, to the said printing telegraphic apparatus whereby upon the sending in of a call either through the central office, or by the calling station direct, the tape and printing apparatus located at the station to which

the call is sent will through the system of electrical distribution set into operation the recording apparatus announcing the location of the signaling station by indicating in cipher on a strip of paper or tape the number of the signaling station, its designation, and the hour and day upon which the signal was transmitted.

The features characteristic of my invention whereby I am enabled to attain the objects thereof are depicted in the several illustrations in the drawings hereto attached and forming part of this specification, and by the descriptive matter of the specification relative thereto and the distinctive features of novelty are referred to finally in the claims.

With reference to the drawings, Figure 1 is a diagrammatical view of a telephonic circuit connected through a central station showing the adaptation of my improvements when employed in connection with the subscribers of a telephonic system connected by central, Fig. 2 a diagrammatic view of the same on a somewhat enlarged scale with certain portions of the recording apparatus in detail, Fig. 3 a side elevational view of a call-box, one side of the casing removed in order to more clearly show the tape feeding mechanism and the telegraphic rheotome, Fig. 4 a vertical sectional view taken through certain parts of the call-box so as to illustrate the electro-magnetic controlling devices taken approximately on the line 4, 4 of Fig. 5, and:—Fig. 5 a sectional plan view of a call-box adapted to my invention with certain parts of the mechanism omitted in order to render the illustration more clear.

In the several figures of the drawings similar characters of reference are employed to indicate like parts wherever they occur, and *a* represents a strip of tape or paper wound in the usual manner, for apparatus of this character upon a drum *b* and is fed usually by spring driven motor mechanism, or through other suitable motive power by the feed rolls or wheels *c* and *d*.

In Figs. 3 and 4 I have illustrated a form of recording apparatus operated by a spring motor through the instrumentality of a main spring *e*, driving shaft *f*, ratchet wheel *g*, main driving wheel *h* and spring pressed pawl *i*. The feed roll *c* is driven by the main driving wheel *h* through a pinion *j*, which for every revolution of the driving wheel *h*

makes a number of revolutions, thereby giving to the feed roll *c* a rapid rotation, while the main driving wheel *h* may make but a partial revolution. Co-rotative with the pinion *j* is an intermediate driving gear *k* which is in mesh with a pinion *l* co-rotative with an escapement wheel *m* engaging an escapement *n*, and in mesh with the pinion *l* is an intermediate driver *o* in mesh with the printing wheel gear *p* co-rotative with the printing wheel *q*.

The printing wheel *q* is inked by an inking roller *r* in a well known and familiar manner which when supplied with ink will maintain a sufficient supply thereof upon the surface of the roller *q* as may be required for printing the message upon the tape *a* as will be hereinafter more fully described.

The signaling apparatus for transmitting the intelligence necessary to identify the station at which the operator is located consists of a spring motor, embodying the main spring *e*¹, a main driving wheel *h*¹, driven thereby through a shaft *f*¹, ratchet wheel *g*¹ and spring pressed pawl *i*¹. The driving wheel *h*¹ is in mesh with a pinion *o*¹ which is co-rotative with a driving gear *p*¹ which is in mesh with a pinion *j*¹ which is co-rotative with the escapement wheel *m*¹, speed controlled by an escapement *n*¹. Co-rotative with the gear *p*¹ is a rheotome or other suitable current varying means which I shall refer to occasionally as a signaling wheel indicated at *s* in Figs. 1, 2 and 3 which is provided with a limiting stop *t*.

The main spring *e*¹ is energized through a key or crank *u* which is rigidly secured to a stop *v*, and the operation of the signaling spring driving mechanism just described is such that upon the rotation of the crank *u* in the direction indicated by the arrow in Fig. 3 the main spring *e*¹ will become energized and will set the shaft *f*¹ into rotation carrying with it the ratchet wheel *g*¹ and rotating the driving wheel *h*¹ through the instrumentality of the spring pressed pawl *i*¹, and through the gear relation with the ratchet mechanism just described will control the speed of rotation of the drive, thereby giving sufficient time for the operation of the rheotome to cause the necessary variation in the strength of the electrical current traversing the electrical circuit to send in the proper signal as will be hereinafter more fully explained. In the meanwhile however, the crank *u* will be returning to its original position, while the contact wheel *s* will be executing a revolution on its axis until its movement will be arrested by the stop pin *t* engaging the stop *v*, thus limiting to the desired extent the degree of rotation of the contact wheel *s*, which in turn is designed to control the nature and character of the signal.

It will be observed particularly with reference to Figs. 2 and 3 that the contact wheel *s* is provided with a number of contact

points *s*¹, *s*², *s*³ and *s*⁴ and that a contact spring *w* having a contact point *w*¹ bears upon the perimeter of the contact wheel *s* whereby electrical contact between the wheel *s* and the contact spring *w* is maintained in order that the electrical circuit may be kept closed, excepting at such time when a signal is being transmitted. During the rotation of the contact wheel *s* the contact point *w*¹ of the contact spring *w* will interrupt the electrical circuit, of which these two members form part, until a contact point *s*¹ shall come in contact with the contact point *w*¹ of the spring *w* when the circuit will again be closed the rotation in the meanwhile continuing will cause the second interruption of the current by opening the circuit after the contact point *w*¹ passes the contact point *s*¹, and will again close the electrical circuit at the contact point *s*², thus giving to the electrical current traversing the circuit two impulses in quick succession, the nature of which are known in the Morse alphabet as dots, and upon the continued rotation of the contact wheel *s* the contact point *w*¹ of the spring *w* will make a somewhat lengthened contact upon the segment *s*⁵ of the contact wheel *s* and continue thereafter to make two dots in the manner aforesaid, thus it will be observed that the signal sent in in this instance will be a dash, two dots a dash and one dot. These impulses traversing the electrical circuit presently to be described of which the contact spring *w* and the contact wheel *s* form a part are communicated to a distant point whereat the recording apparatus is located through the medium of the conductors and circuit connections *a*¹, polarized relay *a*², line wire *a*³, through central station switchboard *a*⁴, communicating line wire *a*⁵, polarized relay *a*⁶, signaling circuit wire *a*⁷ communicating contact wheel *s* and communicating contact spring *w*, conductor *a*⁸ to signaling magneto bell *a*⁹ to telephone switch *a*¹⁰, and when switch *a*¹⁰ is depressed by the weight of the telephone receiver hanging thereon, through said telephone switch and conductor *a*¹¹ and conductor *a*¹², thence to telephone switchboard *a*⁴, to conductor *a*¹³, thence to conductor *a*¹⁴ to callers telephone switch *a*¹⁵, presuming the same to be in contact with the conductor *a*¹⁴ by the weight of the telephone receiver hanging therefrom as aforesaid, through contact *a*¹⁶ magneto call bell *a*¹⁷, conductor *a*¹⁸, contact spring *w* and contact wheel *s*.

Due to the nature of the electrical current developed by the magneto call bell *a*¹⁷, at the signaling station traversing the circuit as aforesaid, which will be pulsatory I have employed a polarized relay as indicated at *a*² and *a*⁶ in the circuit with its armature *b*¹ restrained against a stop *b*² by a tension spring *b*³, whereby a polarized armature *b*¹

of the relay will respond but to unidirectional currents, thereby lengthening the period of vibrations of the armature b^1 to double that of the impulses of the magneto bell which is transmitting the signal.

The armature b^1 is provided with a contact point b^4 which bears against a stop b^5 which closes the circuit of a local battery c^1 through the medium of the conductors and connections and electrical devices to wit local battery wire c^2 , relay armature b^1 , local circuit wire c^3 , electro-magnet c^4 , local battery wire c^5 , effecting for each contact between the contact-points b^4 and b^5 of the polarized relay at both ends of the line, the closing of both local circuits as aforesaid and the energization of the electro-magnet c^4 .

The electro-magnet c^4 is provided with an armature c^6 which is retracted by a tension spring c^7 against a stop c^8 , (see Fig. 4) and is so adjusted so as to respond to the closing of the local battery circuit aforesaid. Secured to and carried by the armature c^6 is a platen c^4 which when the electro-magnet becomes impulsively energized sufficiently to attract the armature c^6 , it forces the strip of paper a against the inked printing wheel q , thus marking it with a series of imprints which articulate with the impulses of the polarized relay aforesaid, and will have the effect of making a series of dots as long as the magneto bell is in action. This does not, however, interfere with the nature of the signal about to be transmitted over the line by the contact wheel s which has a distinct characteristic signal depending upon the dots and dashes in selected order.

The control of the recording apparatus as depicted, more particularly in Figs. 1, 3 and 5, is effected by the electro-magnetic mechanism co-acting with the spring motor consisting of the main spring e , driving wheel h , ratchet wheel g and spring pressed pawl aforesaid, and the speed control escapement mechanism already described, and in this connection the electro-magnet c^4 which is secured to the casing of the instrument does not only when energized effect the printing of the record on the tape in the manner aforesaid through the instrumentality of its armature c^6 , but as well controls the feed of the tape by the feed roller c through the stop mechanism co-acting with the said armature during the period of its attraction with the electro-magnet c^4 , and to this end I provide the armature c^6 with a universally jointed arm c^{10} and c^{11} , which may appear more lucid by referring to Figs. 4 and 5. The portion c^{11} which I shall refer to as an arm, is pivoted to the armature c^6 in bearing relation by a stud c^{12} and carries an arm c^{10} pivoted perpendicularly to the axis of the aforesaid arm, and the two said arms are restricted by a tension spring c^{13} to bear against the seat c^{14} of a spiral boss c^{15} and against the pinion p

when the armature is retracted by said spring c^7 . One terminal of the said spring c^{13} is secured to the armature, and the other end thereof to the arm c^{10} .

The arm c^{10} is provided with a follower c^{16} , which when the armature is retracted by its spring in the manner aforesaid and forces the arm c^{10} upon the drum c^{14} follows the worm c^{15} until the terminal of the arm c^{10} is carried in juxtaposition to the stop c^{17} projecting from the drum c^{14} . This stop mechanism for arresting the feed of the tape when the local battery circuit is open is one of the features of my invention. Upon the energizing of the local battery circuit as already described by the polarized relay, the arm c^{10} co-acting with the armature c^6 being attracted by the electro-magnet will lift clear of the drum c^{14} and the follower c^{16} will become disengaged from the worm c^{15} , thus releasing the stop mechanism and permitting the feed of the tape in the manner already described, while the record is being imprinted on the tape by the lifting of the platen c^4 . During the up and down movement of the arm c^{10} by the pulsations in the electrical circuit which controls the armature c^6 , the stop pin c^{10} contacting with the terminal of the arm c^{10} will arrest the tape as already described, but it will be understood, that it will require at least a complete revolution of the drum c^{14} to transmit the complete signal and to bring the wheel s again to its starting point.

It will be observed in Figs. 2 and 3 that the contact wheel s is provided with an additional means for making contact as shown at s^6 which represents the adaptation of further characters to be printed on the tape of the recording instrument as already described. In said illustration let it be understood that a record is to be made upon the recording tape a of a transmitting instrument at a distant point as already described in connection with Figs. 1 and 2; upon the turning of the handle u in Fig. 3 in the direction of the arrow and the transmission of the message, the imprint of said message upon the tape a will be a dash, two dots, a dash, one dot, a space and a dash, which may be interpreted to mean 5113, party J, "Cortlandt", the dash being understood as 5 when followed by two dots, and the two dots for one each and the dash preceded by two dots, 3, and the one dot after a line, and the length of the space followed by a dash, determining both the code for the district as well as the party.

It is obvious that any character of signal desired consisting of the interruptions in the circuit through a series of contact points of the character described, may be adapted to a code to accomplish the purpose of my invention. In order to record the date and hour of the signal upon the tape a , I provide a lever f^{10} , f^{11} actuated by the arm c^{10} of the ar-

mature c^6 on its upward movement, which lever is pivoted at f^{12} . The lever f^{10} , f^{11} , carries at the terminal of its arm f^{10} a time and date stamp f^{13} consisting of a clock rigidly secured by its hour staff f^{14} to the terminal of the said arm f^{10} against rotation. While the clock f^{13} revolves about its hour staff f^{14} it brings the perimeter of the casing f^{15} and the characters thereon into a printing position, with reference to the tape a . These characters are arranged in equal divisions in accordance with the time in hours or subdivisions between them for minutes and fractions thereof.

The casing f^{15} of the clock f^{14} is subdivided at f^{16} and a second drum f^{17} carried by a calendar wheel of the clock is familiarly arranged with respect to the date, as is the perimeter of the clock aforesaid arranged for the hours and fractions thereof. It will be observed with reference to Fig. 3 that while printing the time upon the tape, a somewhat elongated platen f^{18} supports said tape.

In order to prevent the apparatus from being tampered with incase the same in a suitable envelop or casing, and to render the apparatus exclusive I provide a key switch k^1 and a second supplemental switch k^2 , both of which being requisite to render the system operative or inoperative. With reference to Figs. 1 and 2, the arrangement of these two switches to short circuit the relay by wires a^{19} and a^{20} will be obvious. The switch k^1 being a key renders interference with the instrument somewhat difficult, for the reason that both switches k^1 and k^2 must be closed in order to cut out or short circuit the polarized relay a^2 .

In operating my improved annunciator by the system of distribution, and electromagnetic and other mechanism just described, it will be understood that inasmuch as the current which is transmitted from a signaling station is of a pulsatory character, furnished by a magneto it will be necessary at the time of sending the signal to pull down the crank u in Fig. 3 to its full extent, and before releasing the same to turn the crank of the magneto several times in rapid succession by the other hand of the operator, while "central" has established the through connection.

Since it is the magneto at the transmitting station which furnishes the energy for operating the polarized relay at the recording station, the armature of the polarized relay will vibrate rapidly making a number of contacts with the local recording battery in rapid succession, but during this period the transmitting contact wheel s moving at the customary slow speed for call boxes will make contact with the spring w^1 as already stated making and breaking the magneto circuit with a distinct character which will mark the contrast between the pulsations of

the magneto current; moreover owing to the elasticity of the contact spring w the contact point w^1 thereof will establish a sufficient period of contact over the various contact points which constitute the signal aforesaid to obviate the interference which might be due to pulsations of the magneto current.

During the rapid pulsations of the polarized relay armature at the recording end, the local battery circuit will be rapidly energized and deenergized, the effect of which will be the printing of the tape as though the magneto current were a continuous one. The reason of this being that the dot printed by the impulse during each energization of the local circuit will be sufficiently rapid by the pulsating nature of the magneto circuit to effect the printing of the dots sufficiently close as to blend them into the construction of a line, or dash, but the desired interruption of the printing is caused by the opening of the magneto circuit between the contact points of the contact wheel s by the spring w . It will be understood however, that in lieu of the magneto being employed as a means for transmitting the signal over the line an ordinary continuous current call bell system as has been commonly in vogue may be employed, and when my improved recording telephonic annunciator is adapted on systems of communication employing a signaling system which is transmitted from a central station, the central station is instructed to transmit a lengthy signal prior to the operator at the transmitting station releasing the crank u , which signal should be of sufficient duration to enable the contact wheel s to make one complete revolution.

It is obvious in lieu of using a code of signals such as I have already described, I may select the usual call box method and number each signaling wheel s with the requisite number of contacts to indicate the ordinals in the list of subscribers of such call box, and reference being had to a list of such subscribers, the telephonic number indicating the number of the respective call box will at once give the necessary intelligence to ascertain the desired information.

I am aware that prior to my invention call box systems in vogue have been employed in connection with telephonic circuits through a central office and I therefore do not claim this broadly as my invention,

I do claim however, and desire to secure by Letters Patent of the United States,

1. In a telephonic recording annunciator, the combination of a main closed circuit and signaling apparatus therein of a signaling alarm device and a unidirectional operative relay, and a normally open local circuit involving a battery and electro magnet, and a recording apparatus actuated thereby together with a short circuiting switch in shunt with the relay.

2. In a telephonic recording annunciator, the combination with the main circuit of a unidirectional operative relay, a local circuit coöperating therewith, an alternating current signaling transmitting instrument in circuit with the relay, a printing and recording device controlled by the local circuit and said relay and a time recorder operated by the printing and recording device.

3. In a telephonic recording annunciator, the combination with the main circuit and receiving transmitting and alternating current alarm devices therefor of a signaling magneto, a unidirectional operative relay, a local circuit, a battery and a recording apparatus co-acting therewith and actuated thereby together with means controlled by the relay adapted to chronologically impress the record.

4. In a telephonic recording annunciator, the combination with the main circuit of a polarized relay, a local circuit coöperating therewith, an intermittent current signaling magneto in circuit with the relay, a printing and recording device controlled by the local circuit and said relay, and a time recorder operated by the printing and recording device.

5. In a telephonic recording annunciator, the combination with a main circuit having receiving alternate current transmitting and alarm devices, of a polarized signaling relay, a local circuit and battery coöperating with

said relay, a recording apparatus co-acting with the said local circuit and battery, and a chronological impress mechanism adapted to time the record.

6. In a telephonic system and in combination with the magneto alarm device, a recording annunciator, a polarized relay operated thereby, a local circuit coöperating therewith, an intermittent current signaling instrument in circuit with the relay, a printing and recording device controlled by the local circuit and relay, tape feed mechanism coöperating with the printing device and a stop therefor embracing a cam and follower controlled by the energy of the telephonic circuit.

7. In a telephonic system and in combination with the alarm magneto of a recording annunciator, a polarized relay in the telephonic circuit operated by the magneto, a local circuit coöperating with the relay, an intermittent signaling device in circuit with the relay, a tape feed printing device controlled by the local circuit and a timing recorder co-acting therewith.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 5th day of December 1907.

ROBERT D. LAMPSON.

Witnesses:

C. E. MULREANY,
M. E. DOODY.