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 REGISTERING MECHANISM FOR TELEPHONES.
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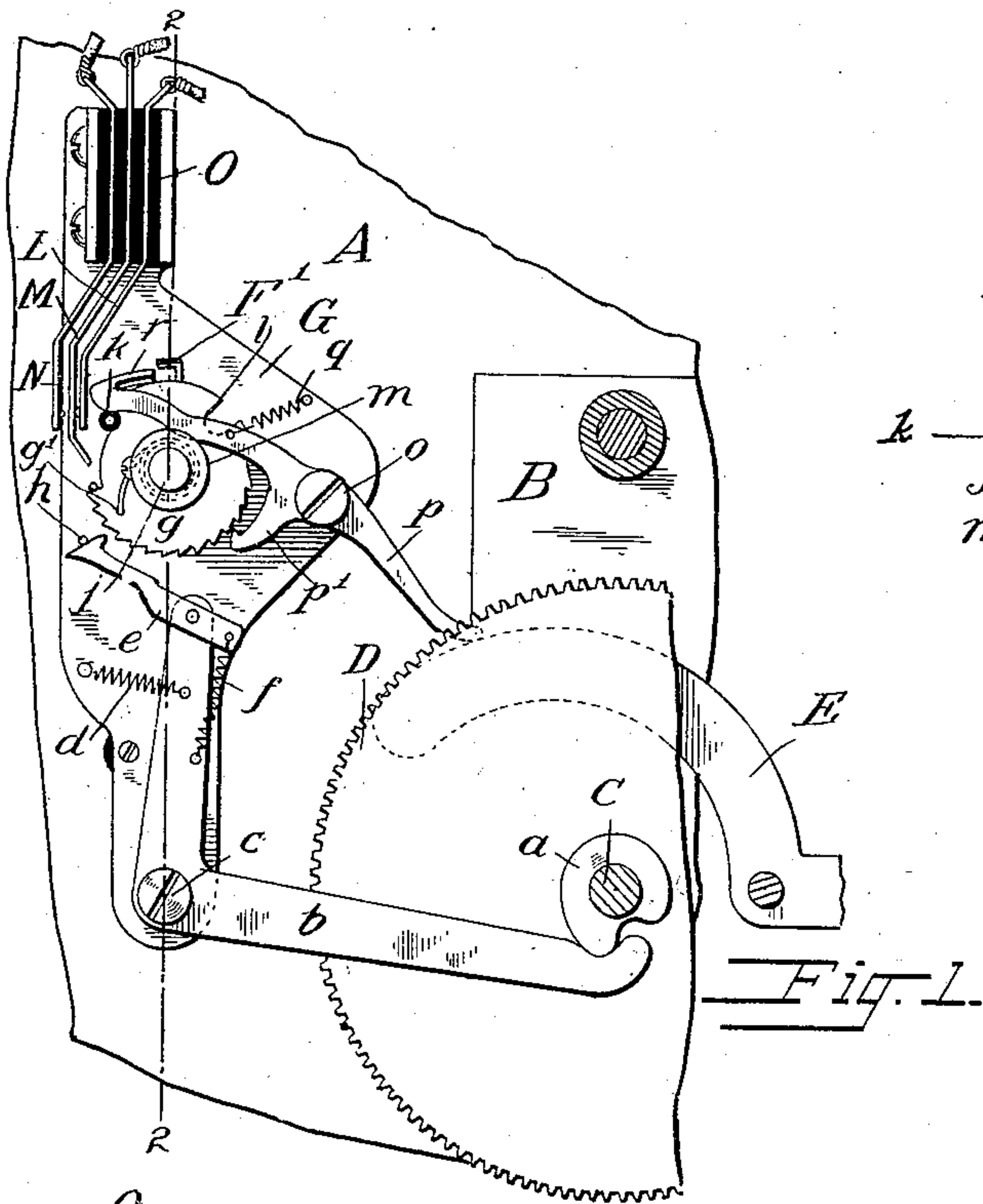


Fig. 1.

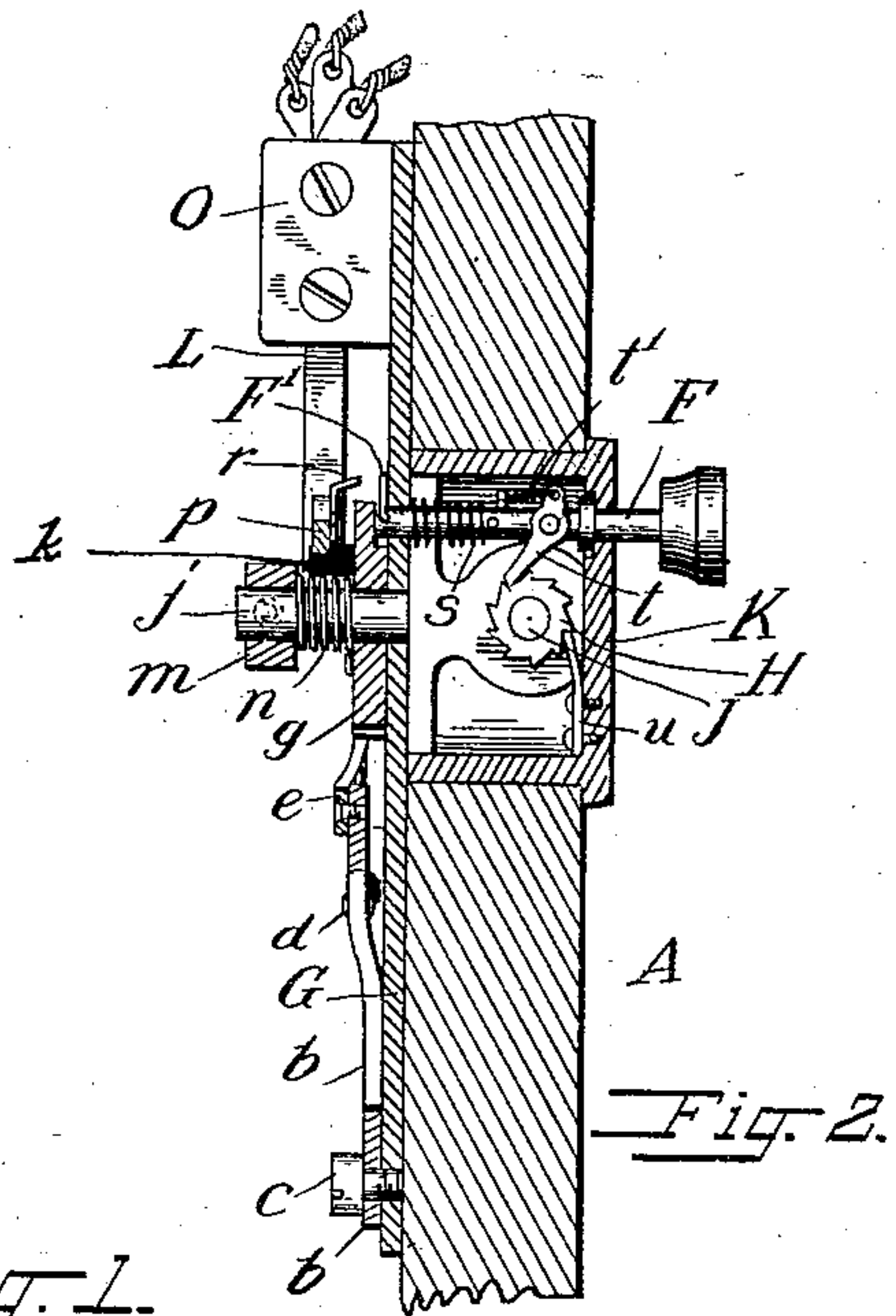


Fig. 2.

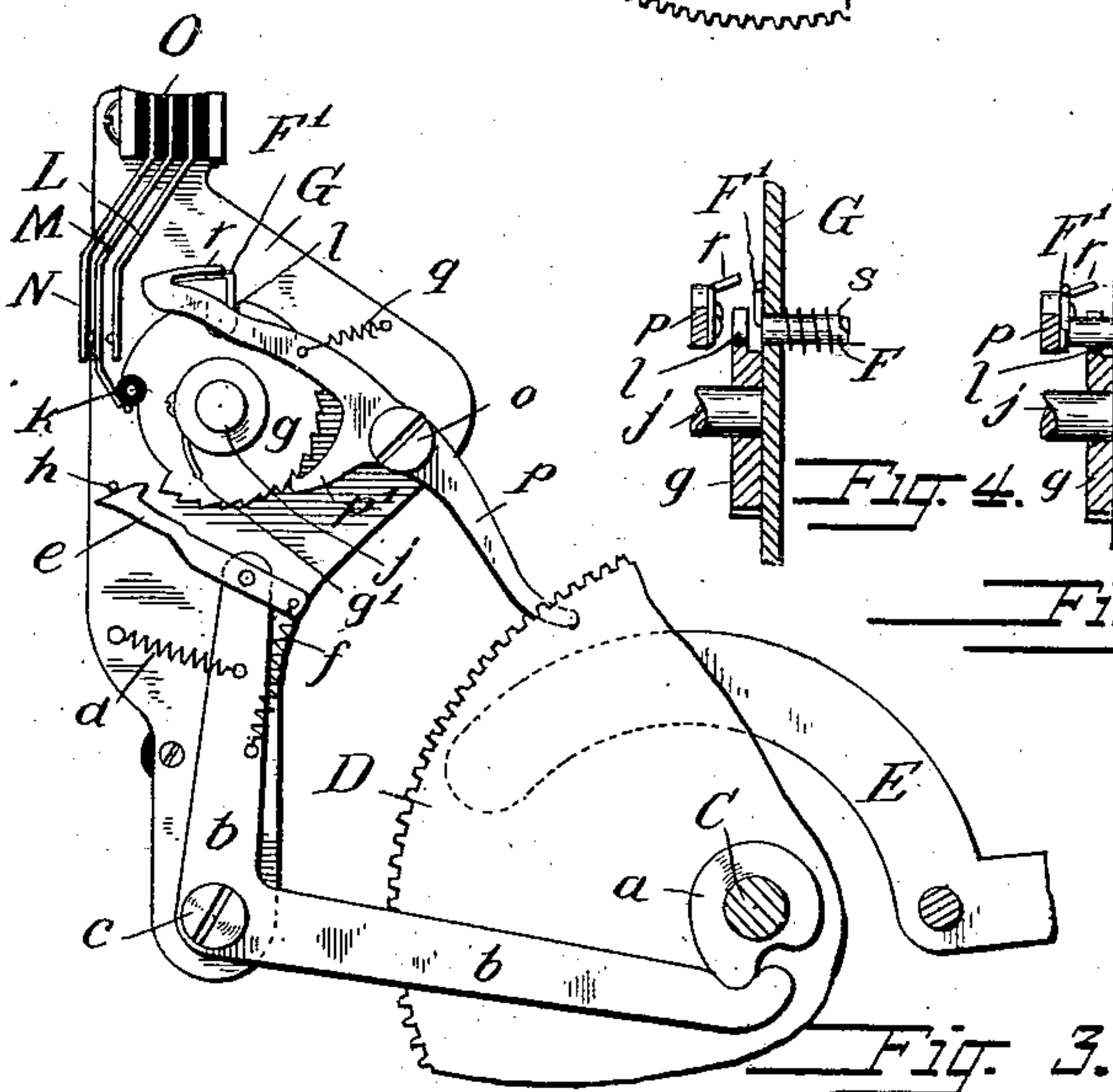


Fig. 3.

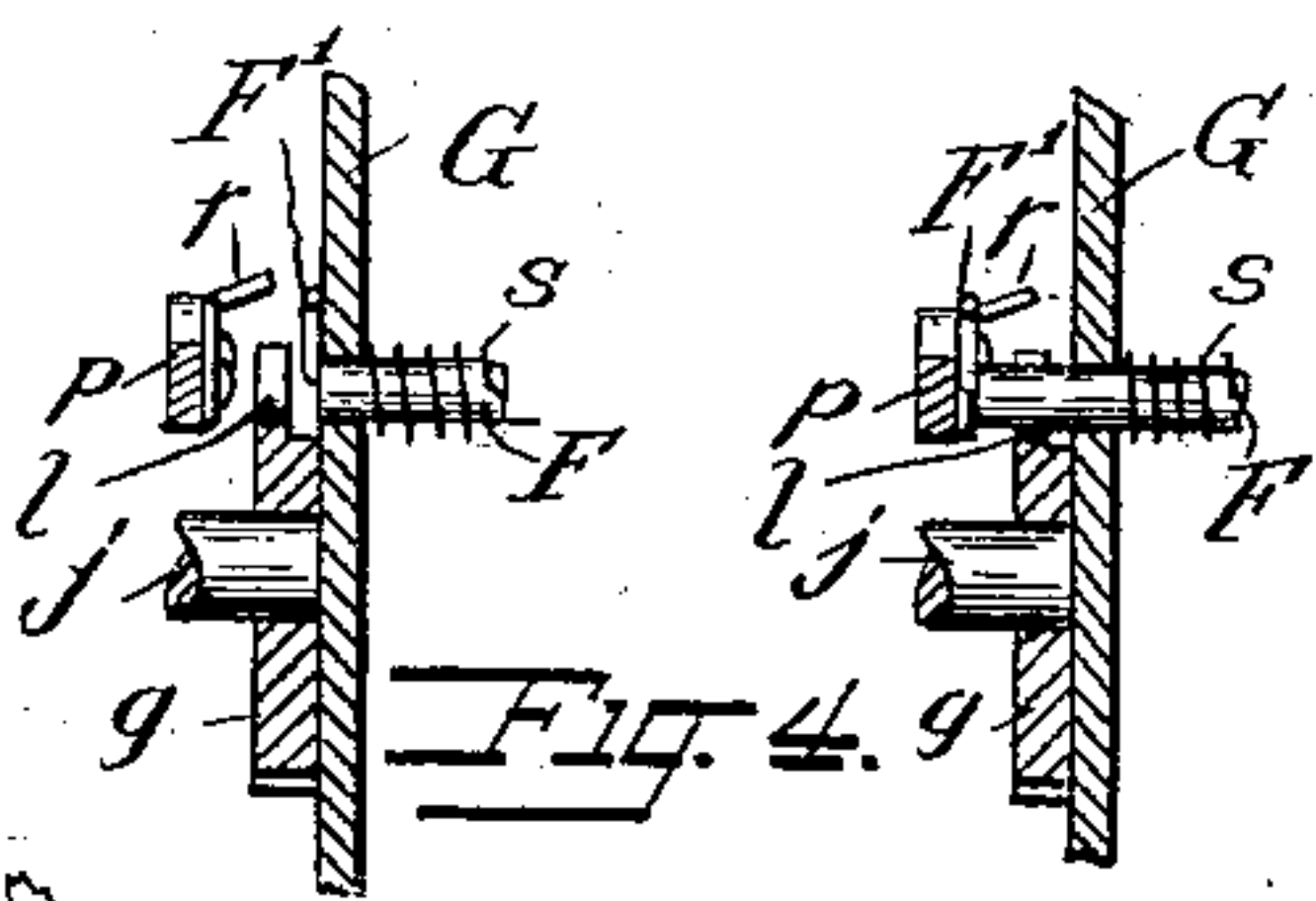


Fig. 4.

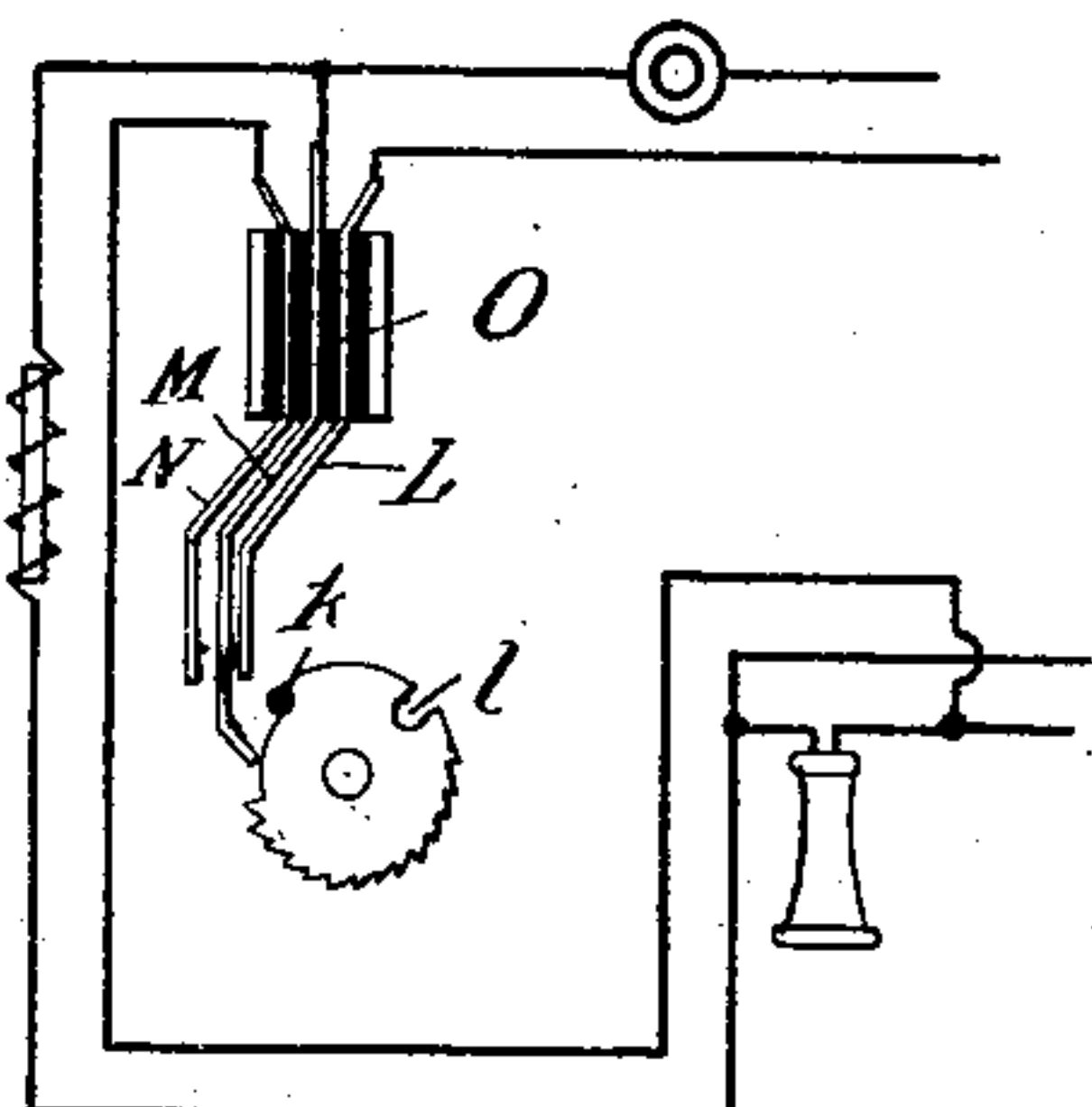


Fig. 5.



Fig. 6.

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REGISTERING MECHANISM FOR TELEPHONES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, VINCENT D. GREENE and KARL W. FORT, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Registering Mechanism for Telephones, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms a part of our specification.

Our invention relates to registering mechanism more especially intended for use in connection with automatic telephones of the well-known type now employed, and has for its purpose the recording of all out-going calls made by the subscriber or user of the telephone, so that an accurate account of the number of times the subscriber used the telephone, is had.

The object of the invention is to provide a device which will be controlled by the mechanism on the telephone whereby the user sends in or effects the call or number he desires, so that the device will be automatically set for registration when the call has been sent in and thus register each out-going call; at the same time, the connection of the registering device with the telephone is such that the telephone can not be used until the user has registered his call on the meter or register by operating a key or push-button, which not only registers the calls on the meter, but at the same time releases mechanism whereby the receiver and transmitter circuits have been disrupted, and permits its return to normal position, thereby restoring the circuits of the telephone to operative condition.

By the use of our invention, no electrical connections are depended upon, for the operation of the register; the registration of the calls on the meter or register are entirely at the instance of the user of the telephone, who must however complete the registration before he is able to carry on communication with the party he called; the register or meter being preferably located on or adjacent to the telephone where the registration can be seen by the user.

In the drawing:—Figure 1, is a plan view of the operating mechanism of our improved register, illustrating the same in its normal condition, attached to the inside of the front or cover of an automatic telephone. Fig. 2,

is a longitudinal sectional view taken on line 2—2 of Fig. 1, with the push-button spindle and the pin and dog connected thereto, shown in side elevation. Fig. 3, is a view similar to Fig. 1, except that the mechanism is shown in the position it assumes just after a call has been completely sent in, but prior to the pushing in of the register stop or button, whereby the register is operated, and the circuits restored. Figs. 4 and 5, are detail views of the register push-button spindle and releasing mechanism, showing same in its normal position—(illustrated in Fig. 1) and in position after sending in a call, just prior to operating the register (illustrated in Fig. 3), respectively, with the button-spindle and balance of the mechanism broken away. Fig. 6, is a diagrammatic view of the transmitter and receiver circuits affected, and the mechanism whereby the same is carried out, to more clearly illustrate the construction shown in elevation in Figs. 1 and 3.

Like letters of reference indicate identical parts in the respective figures.

A, represents the cover or front of a telephone broken away, while B, is the metallic frame or casing, (only partly shown) secured to the inside of the cover or front A, and within which is mounted the call-effecting mechanism of the type of automatic telephones now employed.

As our improvement forms no part of the telephone proper, it is not necessary to illustrate the mechanism thereof, beyond that portion with which our improvement is operatively connected, as will more fully hereinafter appear.

C, is the shaft on which the dial or lever on the outside of the cover or front of the telephone, is secured, whereby the shaft C, is given the predetermined amount of rotation designated by the number and extent of operations of the dial or lever; and D, is a gear keyed on shaft C, whereby mechanism is operated to effect the calls, while E, is a portion of the lever or hook on which the receiver is hung.

All of the mechanism thus far referred to, is of the type employed on the style of automatic telephones now in use, and forms no part of our invention.

Secured on the inner end of the shaft C, is a cam *a*, against which one end of a bell-crank lever *b*, takes. This lever is suitably

pivoted at *c*, and is held in contact with cam *a*, by spring *d*. Pivotaly mounted on the other arm of bell-crank lever *b*, is a dog *e*, which is held under tension by spring *f*.

5 The normal tendency of spring *f*, would be to throw the dog *e*, upward and into mesh with disk or ratchet-wheel *g*, but when lever *b*, is in its normal position as seen in Fig. 1, the dog *e*, is held out of mesh by the pin *h*, 10 on the frame or casing, and the elongated head on the dog *e*. When shaft C, is rotated and with it cam *a*, the lever *b*, will be rocked, thereby moving dog *e*, far enough to the right to permit the action of spring *f*, to 15 take effect and bring dog *e*, into mesh with ratchet-wheel *g*; pin *h* and the elongated head of dog *e* guiding dog *e*, in its movement and preventing the same being thrown too far. Mounted on spindle *j*, is the ratchet- 20 wheel *g*, which need only be supplied with teeth about a portion of its periphery, as shown; it is also provided with an insulated pin *k*, at a predetermined point; and also has the notch *l*, cut into its periphery, (see 25 Figs. 1 and 6) at a predetermined point, the purpose for which will be hereinafter set forth. Wound about the spindle *j*, with one end secured in collar *m*, and the other secured to ratchet-wheel *g*, as seen at *g'*, is a 30 spring *n*, (see Fig. 2). The purpose of this spring *n*, is to return ratchet-wheel *g*, to its normal position as soon as the same has been released by the lever and pawl now to be described. Pivoted at the point *o*, to the 35 frame or casing, is lever *p*, the free end of which takes onto and is held in contact with the receiver-hook or lever *E*, by the action of spring *q*. The lever *p*, has pawl *p'* which is thrown into mesh with ratchet- 40 wheel *g*, when the free end of lever *p*, drops downward upon the lifting of the receiver. This also brings the other arm of lever *p*, upward as shown in Fig. 3. This arm is hooded at the end as shown at *r*, the hood 45 being at a slight angle or incline toward the rear or casing side, as can more clearly be seen in Fig. 2, 4, and 5, and extends slightly above the ratchet-wheel *g*. The purpose of the hood will be set forth later.

50 *F*, (see Figs. 2, 4, and 5) is a push-button spindle which is normally held out in the position shown in Fig. 2, by the spring *s*, which may be placed intermediate of the frame *G*, and a pin or collar on spindle *F*, 55 on which the different parts above described are mounted and which is shown secured on the inner face of the door. This spindle *F*, terminates in the hook *F'*, the end of which is preferably bent downward 60 and normally is slightly beneath the rear side of hood *r*, as can more clearly be seen in Fig. 4, and travels in a horizontal plane slightly above that of the forward edge of hood *r*. As hood *r*, however is made of a 65 thin strip of metal, it has enough resiliency

to permit hook *F'* to press by it and permit the push-button spindle *F*, to be pressed in to its fullest extent. As the push-button spindle *F*, is released, spring *s*, of course returns it to normal position, and in view of 70 the angle at which both hook *F'* and hood *r*, are placed, hook *F'* returns across the top of hood *r*, and as hook *F'* strikes the upwardly inclined rear edge of the hood, it presses the hood downward against the 75 action of spring *q*, releasing pawl *p'* from engagement with ratchet-wheel *g*, permitting the latter to return to normal position, through the action of spring *n*. Mounted on 80 spindle *F*, and inclosed either within the front or cover of the telephone box or casing, where it cannot be tampered with, is a spring-controlled pawl *t*, (see Fig. 2) which engages a ratchet-wheel *H*, secured on spindle *J*, on which are secured the registering 85 disks of the usual step-by-step type employed, the one disk representing units, the next tens, the third hundreds, fourth, thousands, etc.; the complete revolution of one disk compelling the adjacent disk to move 90 one notch or step to record the ten steps or complete revolution of the first disk. As this register is of the well-known type, we do not deem it necessary to enter into any further description thereof or present any 95 detail illustration. The registering-disks are preferably incased in casing *K*.

It will be seen from an examination of Fig. 2, that upon pressing in spindle *F*, the pawl *t*, (which is constantly held in contact 100 with ratchet-wheel *H*, by spring *t'*) will turn ratchet-wheel *H*, one notch, also turning spindle *J* partly, on which the registering-disks are mounted, (the unit disk only 105 having positive connection therewith), thus bringing the next number on the disk opposite an opening in casing *K*, to permit the same to be seen.

In order to prevent the frictional contact of pawl *t*, with ratchet *H*, from turning 110 spindle *J* backward, the flat spring *u*, is provided. *L*, *M*, and *N*, are contact-springs or electrodes, which are of course insulated from each other in the usual manner as at *O*; spring *M*, is slightly longer than the 115 rest, and has its lower end bent slightly toward ratchet-wheel *g*. Springs *L*, and *M*, are the electrodes or contacts for the talking or transmitter circuit, while spring or electrode *N*, in connection with spring *M*, 120 shunts the resistance across the receiver circuit thereby affecting the receiver as well as the transmitter, as will be set forth.

The operation of the mechanism is as follows:—As the receiver is lifted from its 125 hanger or hook *E*, (which is always done in the automatic telephone before the dial or lever secured to, spindle *C*, is turned the requisite distance and number of times to send in the call desired) lever *p*, drops by 130

action of spring q , bringing pawl p' , into contact with ratchet-wheel g , (see Fig. 3) thereby throwing the hooked-end r , of lever p , up and slightly in front of hook F' , of the push-button spindle F ; then, as shaft C , is turned, cam a , will rock lever b , bring pawl e , into contact with the disk or ratchet-wheel g , and move it one notch or distance of a tooth, pawl p' , preventing disk or ratchet-wheel g from turning back to its normal position. As it is customary in automatic telephone systems, to run the calls or numbers in series, as for example, either with two, three, four, five, or six digits to the number, so that all subscribers in a given locality or city will have calls or numbers composed of the same number of digits, the ratchet-wheel g , is provided with teeth corresponding in number with the number of digits composing the series selected by the exchange. The ratchet-wheel g , is moved by pawl e , on the bell-crank lever b , a distance corresponding with the distance between the lower bent end of electrode or contact-spring M and pin k , when ratchet-wheel g , is in normal position, and this distance must also correspond with the distance between pin k , and notch l , in the disk or ratchet-wheel g , so that, when the call has been completed, pin k , will be in contact with the lower end of spring M , breaking the contact between it and contact-spring L , and bringing it into contact with contact-spring or electrode N , (see Fig. 3). This will also bring notch l , opposite the end of push-button spindle F . It will thus be seen that the transmitter or speaking circuit—(springs L and M)—has been opened or broken, and the receiver-circuit shunted—(springs M and N). In this condition, the user of the telephone can hear the party he is calling, faintly through the receiver, but he himself cannot be heard; having established connection with his party, he then registers the call by pushing spindle F , thereby operating ratchet H , securely mounted on register-spindle J , compelling the succeeding number to come into view opposite a small opening in the telephone front or cover; he then releases the push-button F , (which returns to its normal position by the action of springs s) and the hook F' on the inner end of spindle F , rides back over the inclined hooded end r , of lever p , slightly depressing hood r , and with it lever p , thus also disengaging pawl p' from ratchet-wheel g , permitting the latter to turn back from the position shown in Fig. 3, to normal—shown in Fig. 1—by the action of spring n , (Fig. 2). The call having been registered, (and only after the party called has responded) the contact-spring M , rebounds to its normal position, out of contact with spring N , restoring the receiver circuit to normal, bringing it into

contact with contact-spring L , completing the transmitter circuit.

By reason of the construction employed, it is impossible to cause more than one registration of a call, as spindle F , cannot be pushed in after disk or ratchet-wheel g , has returned to normal, because notch l , is then somewhat to the side of the end of spindle F , as seen in Fig. 1. This locks the register against any accidental operation.

It will be seen that with our improved construction, it is not possible to carry on a conversation with the party called, without first registering the call, although it is possible, to hear, somewhat faintly, the response of the party called, and by shunting the receiver-circuit as described, it is not possible to carry on a conversation through the receiver alone. When the call has been registered, the registering mechanism is restored to normal as before described, ready for the next outgoing call. Should the party called make no response, the mere hanging up of the receiver on lever or hook E , will return the registering mechanism to normal, the same as that of the telephone proper, as the end of lever E , lifts lever p , disengaging pawl p' .

We have described the mechanism as applied to the style of automatic telephones employing the dial, but it is understood that the mechanism is equally applicable to telephones where, for example, a lever might be operated horizontally or vertically or in any direction, as it is merely necessary that any operation of spindle C , be made to rock lever b , and that the receiver-hook contact with the free end of lever p .

It is apparent that the construction may be altered in a number of minor details without departing from the spirit of our invention, and we do not wish to be understood as limiting ourselves to the precise construction shown and described, but

What we do claim as our invention and wish to secure by Letters Patent, is:—

1. In combination with the call-effecting device of an automatic telephone, a register for the out-going calls comprising registering-disks, a circuit-affecting-mechanism, means intermediate of the call-effecting device and circuit-affecting-mechanism adapted to be operated by said call-effecting device to control the circuit-affecting-mechanism whereby the transmitter-circuit is broken and the receiver-circuit affected, and mechanism whereby the registering-disks are operated and the circuit-affecting-mechanism released and the circuits automatically restored.

2. In combination with the call-effecting device of an automatic telephone, a register for the out-going calls comprising a set of registering-disks, mechanism controllably connected with the call-effecting device

whereby the circuits of the telephone are affected upon the operation of the said call-effecting device, and means whereby the registry-disks are operated and the circuit-affecting mechanism released from said call-effecting device and the circuits restored.

3. In combination with the call-effecting device of an automatic telephone, a register for the out-going calls comprising registering-mechanism, a circuit-controller, a lever intermediate of the call-effecting device and said controller, and means whereby the registering mechanism is operated and the controller returned to its normal position.

4. In combination with the call-effecting device of an automatic telephone, a register for the out-going calls comprising registering mechanism, a circuit-controller, contact-springs or electrodes adjacent to said controller, a lever intermediate of the call-effecting device and said controller whereby the latter is operated a predetermined degree upon the movement of the call-effecting device, and spring-controlled means adapted to operate the registering mechanism and permit the circuit-controller to return to its normal position.

5. In combination with the call-effecting device of an automatic telephone, a register for out-going calls comprising registry-disks, means adapted to be operated by the call-effecting device, mechanism intermediate of said means and the registry-disks whereby the receiver and transmitter circuits may be affected at a predetermined point, and means controllingly connected with the registry-disks and the circuit-affecting mechanism whereby the former are operated and the latter released from contact with the receiver and transmitter circuits.

6. In combination with the call-effecting device of an automatic telephone, a register for out-going calls comprising a set of registry-disks, circuit-affecting mechanism, levers intermediate of the call-effecting device and said mechanism whereby the latter is operated to a predetermined degree and the receiver and transmitter circuits affected, and spring-controlled means whereby the registry-disks are moved and the circuit-affecting mechanism released from contact with the receiver and transmitter circuits.

7. In combination with a call-effecting device of an automatic telephone, mechanism for registering the outgoing calls comprising a set of registry-disks, a pair of levers, one of which is controlled by the call-effecting device and the other by the receiver-hook, a set of contact-springs, two of which are normally in contact and constitute the transmitter circuit and the other connecting with the receiver-circuit and normally out of contact with the adjacent spring, mechanism adapted to be operated as said levers are

moved whereby the transmitter circuit is opened and the resistance across the receiver circuit shunted at a predetermined point in the operation of said mechanism, and means operatively connected with the registry-disks and said mechanism, whereby the registry-disks are moved one step and said mechanism disconnected from the contact-springs to restore the circuits.

8. In combination with the call-effecting device of an automatic telephone, mechanism for registering the out-going calls comprising a set of registry-disks, levers adapted to be affected by the call-effecting device, mechanism controlled by said levers and determining the time of operation of the registry-disks and adapted to affect the receiver and transmitter circuits upon the complete operation of the call-effecting device, and spring-controlled means whereby the registry-disks are operated and said mechanism released and the circuits restored to normal.

9. In combination with the call-effecting device of an automatic telephone, registering mechanism for the out-going calls, comprising a set of registry-disks, a spring-controlled ratchet-wheel provided with a pin and notch spaced apart a predetermined degree, levers intermediate of the call-effecting device and said ratchet-wheel and adapted to operate the latter upon each movement of the call-effecting device, a set of contact-springs adjacent to said ratchet-wheel, two of which normally complete the transmitter circuit, the other connecting with the receiver circuit, the pin on the ratchet-wheel adapted to take against one of said contact-springs to break the transmitter circuit and shunt the resistance across the receiver when the ratchet-wheel has turned a predetermined degree, and means having controlling connection with the registry-disks and taking into the path of one of said levers, whereby, upon the operation of said means, the registry disks are moved a step and the ratchet-wheel released from said lever and returned to its normal position.

10. In combination with the call-effecting device of an automatic telephone, registering mechanism for the out-going calls comprising a set of registry-disks, a circuit-affecting mechanism consisting of a spring controlled ratchet-wheel provided with a pin and notch at a predetermined point and levers intermediate of the call-effecting device and said ratchet-wheel and adapted to operate the latter upon each movement of the call-effecting device, a set of contact-springs adjacent to said ratchet-wheel, two of which normally contact and constitute the transmitter circuit and the other connecting with the receiver-circuit and normally out of contact with the adjacent contact-spring, and means whereby the registry-disks are moved and the spring-controlled ratchet-

wheel released from said levers, the operation of the circuit-affecting mechanism being so timed that upon the completion of a call by the call-effecting device said pin will
5 separate the transmitter circuit contact-springs and place one of said springs into contact with the receiver-circuit spring, and

said notch will be brought into the path of said means.

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