

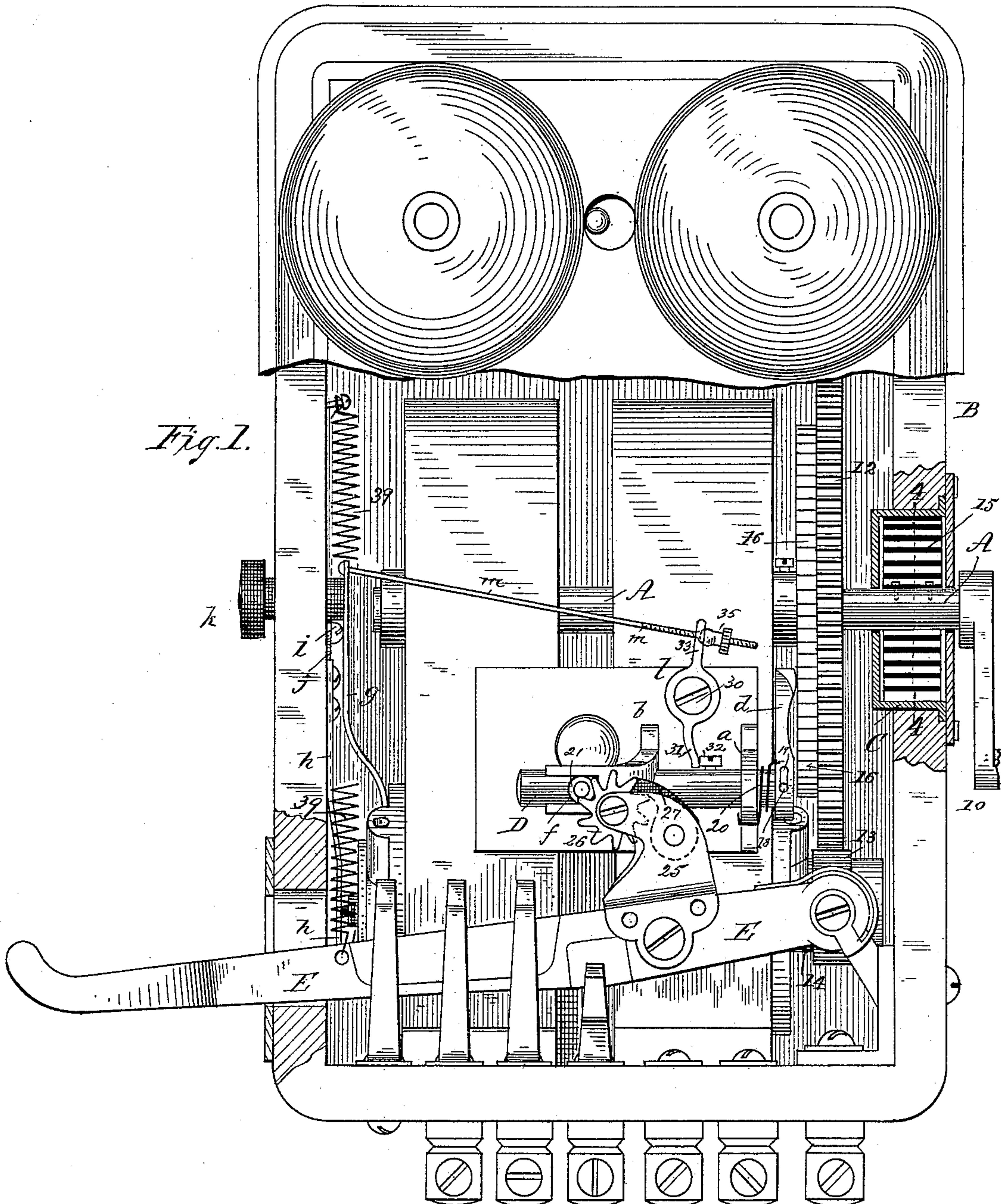
(No Model.)

3 Sheets—Sheet 1.

A. GRIFFITH & H. A. BURBANK.
TELEPHONE CALL BOX.

No. 397,284.

Patented Feb. 5, 1889.



Witnesses,

Wm. F. Fellows
Wm. H. Chapin

Inventors,

Amenzo Griffith,
and Henry A. Burbank,

By their Attorneys

Chapin & Co.

(No Model.)

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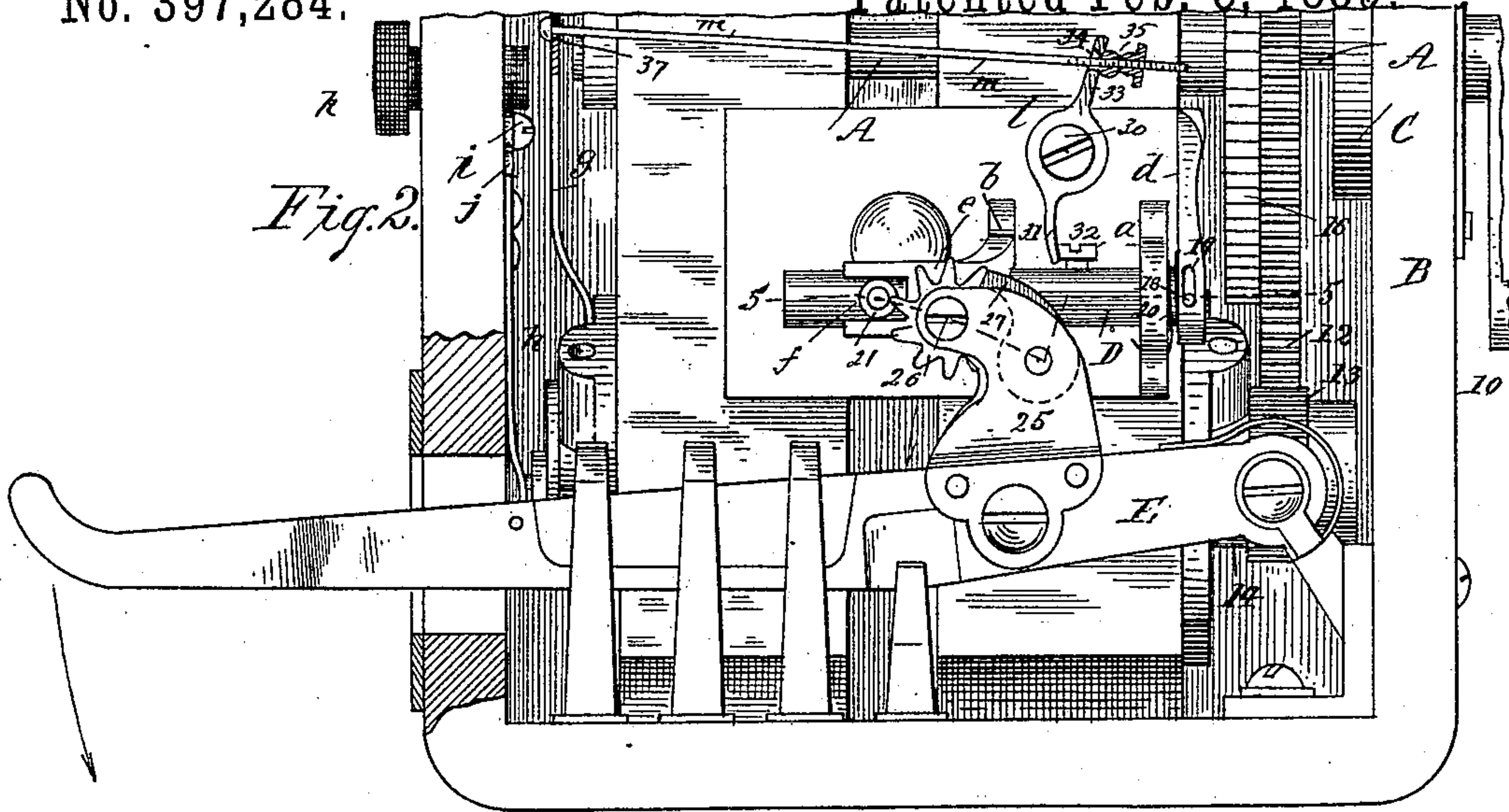


Fig. 3.

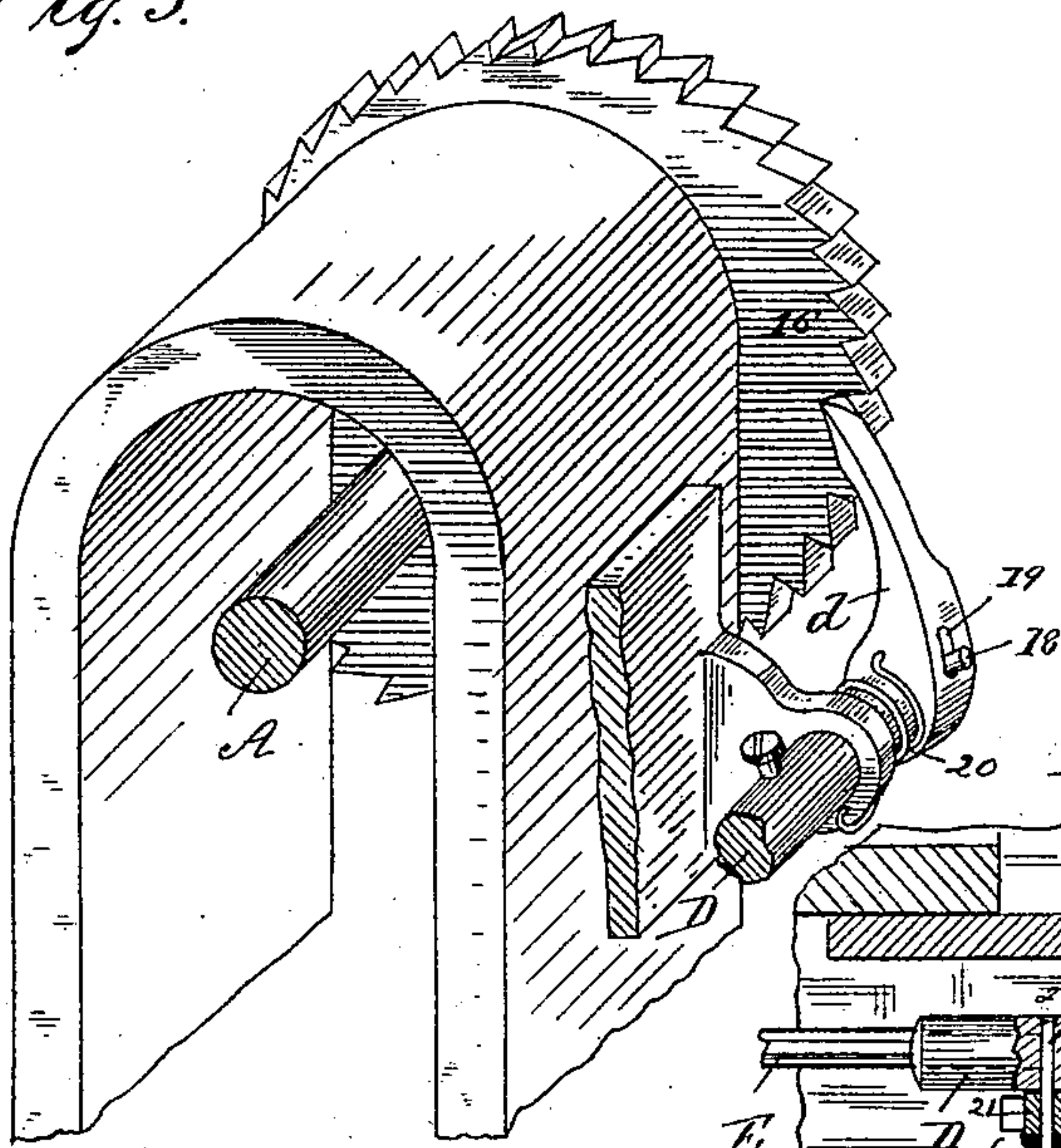


Fig. 4.

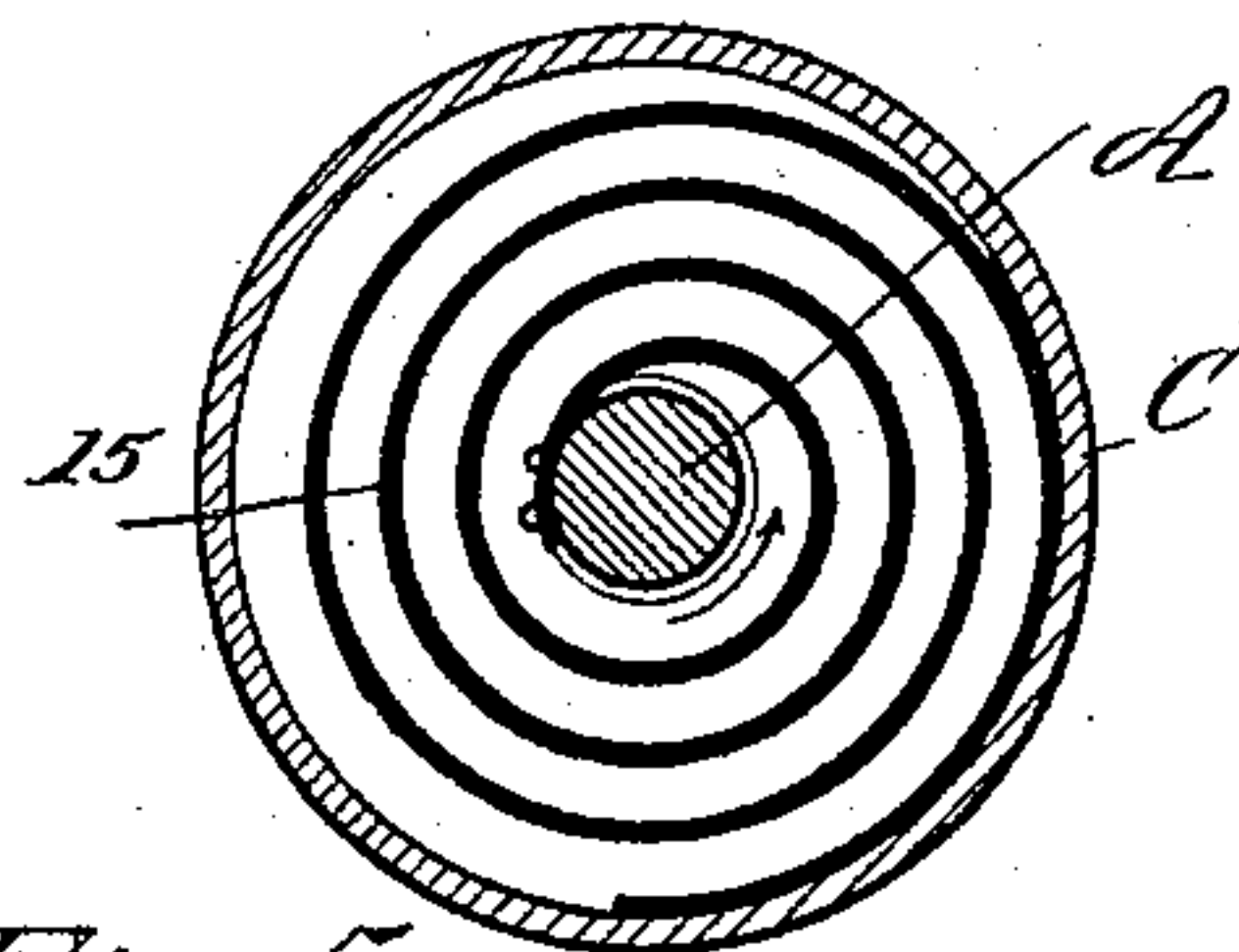
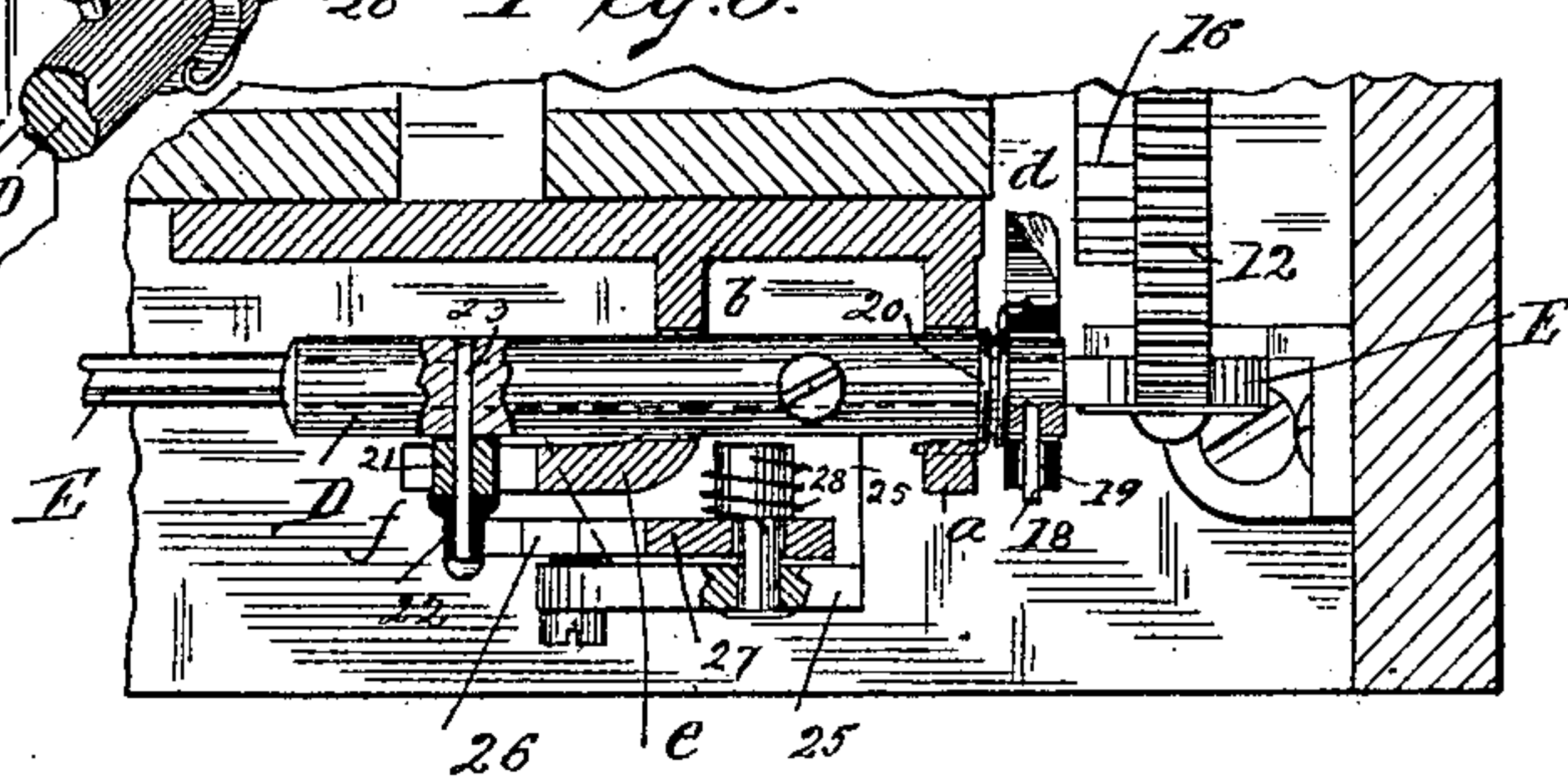


Fig. 5.



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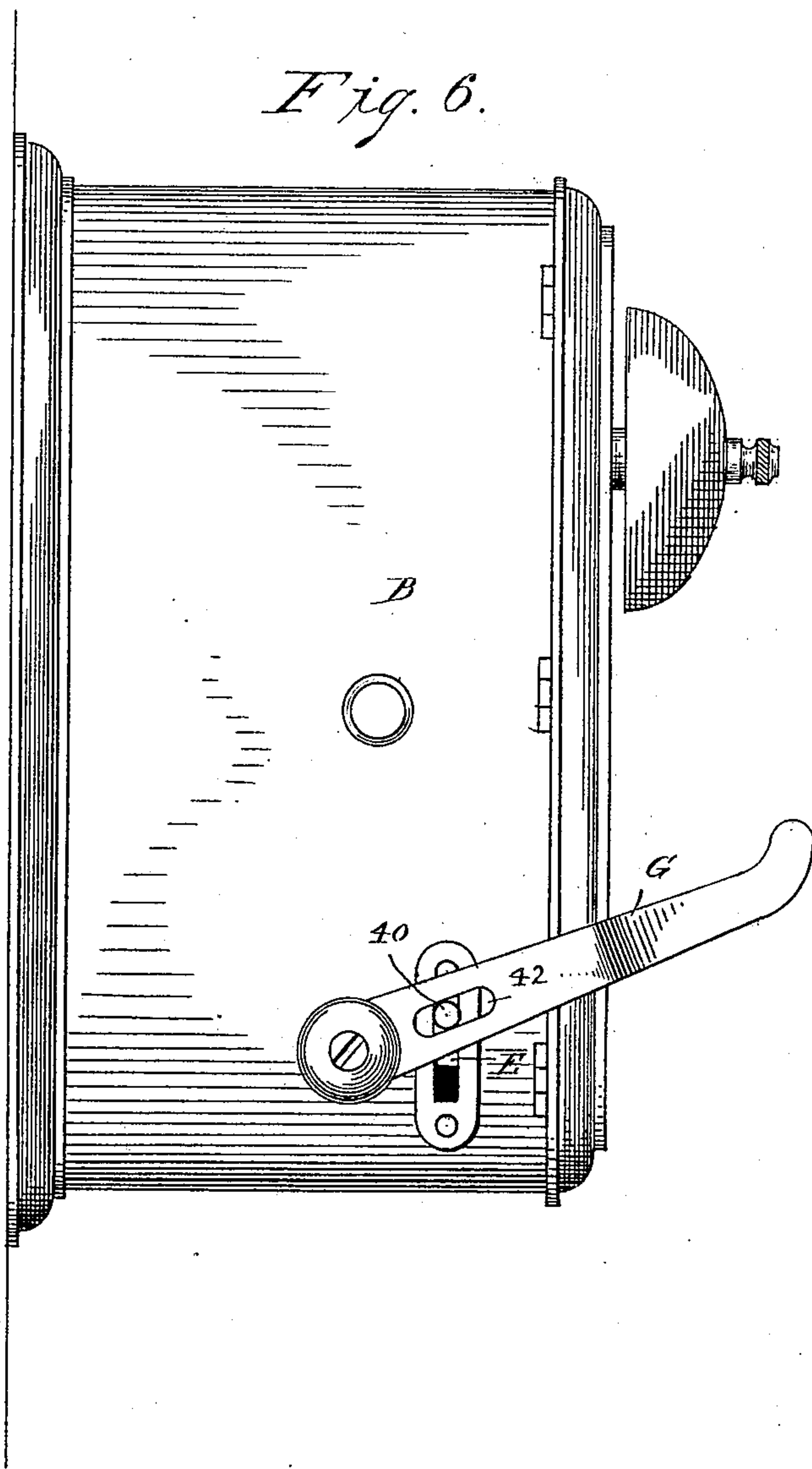
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UNITED STATES PATENT OFFICE.

AMENZO GRIFFITH, OF SPRINGFIELD, AND HENRY A. BURBANK, OF WESTFIELD, MASSACHUSETTS.

TELEPHONE CALL-BOX.

SPECIFICATION forming part of Letters Patent No. 397,284, dated February 5, 1889.

Application filed November 6, 1888. Serial No. 290,138. (No model.)

To all whom it may concern:

Be it known that we, AMENZO GRIFFITH and HENRY A. BURBANK, citizens of the United States, residing at Springfield and Westfield, respectively, both in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Telephone Call-Boxes, of which the following is a specification.

10 The object of the present invention is to provide means whereby a "subscriber" using a telephone may avoid the present special operation of "ringing-off," as it is termed, or, in other words, when through using the tele-
15 phone temporarily establishing the proper connection with the central-office annunciator, and by the turning of the magneto-shaft sending a magneto-current through such connection to notify the central office that his
20 use of the telephone has been finished; and, in more direct terms, the purpose of the invention is to provide mechanism which may be interposed between the telephone-receiver, supporting-arm, and the driving-shaft of the
25 magneto which will not interfere with all the usual operations of the telephone as at present carried out, and yet on the downward movement of the receiver-arm, on the hanging of the receiver thereon, will cause or permit,
30 through the downward movement of said receiver-arm, a second operation of the magneto to signal the central office, the proper electrical circuit-connection, including the magneto and the central-office annunciator,
35 at such time being automatically established; and the invention consists in the construction, combination, and arrangement of various parts, all substantially as will hereinafter fully appear and be set forth in the claims.

40 The present invention is shown in the accompanying drawings as applied on the telephone call-box of the well-known form at present in general and universal use throughout the country, and it will be here observed
45 that the parts constituting said call-box and signaling apparatus are in no material manner changed, all connections and circuits being as usual, and in said drawings—

50 Figure 1 is a front elevation of a subscriber's call-box with the lower portion of the front or cover broken away and some parts

in section, and showing the automatic ringing-off device as applied in operative relation to the usual mechanism embodied in said call-box, the said parts being in their positions of disuse, the receiver holder-arm in its lowermost position, or the one it is made to occupy when the receiver is hung thereon, and the magneto-connections "short-circuited." Fig. 2 is an elevation similar to Fig. 1 at the lower part of the call-box, but showing the parts in their positions at the time the receiver holder-arm is passing from its uppermost to its lowermost position, at which time the ringing-off will be automatically effected. Fig. 3 is a perspective view, in detail, to be hereinafter referred to, while Figs. 4 and 5 are respectively a vertical and a horizontal section of portions of the mechanism, taken on the lines 4 4 and 5 5 of Figs. 1 and 2, and which will be hereinafter referred to. Fig. 6 is a side elevation of the call-box, illustrating a modified form of the receiver holder or support.

The shaft A, for securing through the crank-handle 10 the rotation of the armature of the magneto through means of its gear 12, meshing with a pinion, 13, on the spindle 14 of the rotary armature at its passage through the side wall of the box B, is surrounded by a drum, C, and to the shaft within said drum one end of an involute band or clock-spring, 15, is secured, a sufficient number of coils thereof being disposed between its secured end and its outer end portion, which is unsecured, but bears with a spring-pressure against the inner walls of the drum.

On a turning of the shaft A to generate a magneto-current to signal the central office—for instance, in the direction of the arrow, Fig. 4—from the centrifugal spring-pressure of the outer end of the coil on the wall of the drum, the said coils will not be immediately turned in consonance with the shaft, but will be more or less wound up and capable of an increased recoil; but after a certain extent of rotation of the shaft the spring may drag by its outer end around on the wall of the drum, whereby a continued and indefinite rotation of the shaft to operate the magneto-electric generator may be had without hinderance by or further effect on the spring, but on a re-

lease of the force applied to rotate the crank under the recoil of the said spring the shaft will be rotated in the reverse direction and a second magneto-current will be generated.

5 A sliding shaft, D, is constrained to move horizontally and without rotation through supporting-lugs *a b*, supported from the U-magnets of the generator or from other suitable part, its one end being provided with a
10 spring-pawl, *d*, in position for engagement at the proper times with a ratchet-wheel, 16, which is fixed on the shaft A. As will be seen in Fig. 5, the said pawl loosely encircles the slide-shaft D, and is capable of a partial rotation thereon to an extent regulated by the
15 fixed radial pin 18 on the shaft and the slot 19 in the walls of the pawl, through which said pin enters, and a spiral spring, 20, is applied between the lug *a* and the pawl to perform the double duty of forcing the shaft
20 outwardly toward the ratchet, and also partially rotating the pawl on its shaft, so that its tooth will normally lie below the roots of the ratchet-teeth. The said spring for the accomplishment of these functions is by one
25 end portion made to embrace the said lug, then to encircle the shaft between the lug and the pawl, and by its other end fastened to the pawl outside of its center of rotation.
30 The lug *b* is bent on itself at right angles and extended horizontally in a slotted or bifurcated bracket, *e*, outside of the shaft D, between the legs of which is a post, *f*, fixed on and carried by said shaft, and which post by
35 its sides bears on the inner walls of the bracket-legs and affords means for preventing the rotation of the said sliding shaft. The said post is preferably bushed with a friction-sleeve, 21, and is extended outwardly
40 beyond the plane of the bracket *e*, receiving, preferably, another and separate friction-sleeve, 22, of reduced diameter.

One particular formation of the duplex-sleeved post is shown in Fig. 5, the sleeve
45 parts being held in place by the headed axial pintle 23, passing through said sleeves and the shaft. One or both of the sleeves might be dispensed with on the post, which, however, would be formed of the proper diameter; but for obvious reasons the sleeve provision is preferred.

Upon the usual swinging receiver holder-arm, E, a rigid angular bracket, 25, is fixed to move therewith and carries on its inner side
50 a toothed wheel, 26, to engage by its teeth the outer portion of said post *f*, said wheel being journaled on the bracket for an intermittent rotation, as will appear. Instead of making the teeth of said wheel with their median lines
55 truly radial, the median line of each tooth is a tangent to a circle somewhat outside of the center, such wheel by this formation being more effective in its operation, to be hereinafter explained. A spring-pawl, 27, is hung
60 on the bracket 25 to engage the said toothed wheel, permitting the rotation of the wheel in one direction and obstructing its reverse ro-

tation, as will be plain on reference to Figs. 1, 2, and 5, in the latter figure the manner of application of the spring 28 for its action on
70 the pawl being shown.

g h represent the usual contact-springs, which, with the contact-screw *i* and wire *j*, form the short circuit for the magneto, and which short circuit, as well known, is estab-
75 lished under the normal relations of the parts of the call-box, and, as shown in Fig. 1, at such time rendering the line-circuit inoperative; but by forcing, through the push-button *k*, the spring *g* away from the contact-
80 screw *i* the line-circuit is established for signaling the central office.

A swinging lever, *l*, intermediately pivoted on a fixed stud, 30, supported from the magnet or otherwise, has its one arm, 31, lying in
85 proximity to an abutment-pin, 32, on the slide-shaft D, and its other arm, 33, is provided with an aperture, 34, Fig. 2, through which a connecting-rod, *m*, passes, said connecting-rod at its end engaging the lever-arm 33, be-
90 ing screw-threaded, receiving an adjusting and check nut, 35, the other end of said connecting-rod passing loosely through an aperture, 37, in the outer end of the contact-spring
95 *g* and receiving a head at its extremity. Any action of the push-button and movement of the contact-spring *g*, as usual, will have no effect on the parts of this invention, due to the
100 fact that the spring *g* may loosely slide over the rod *m*; but should there be any undue bind between the spring and rod, whereby the rod would be moved endwise by the spring, said rod by its other end portion could slide
105 freely through the aperture in the lever-arm 33.

The operation of our improved mechanism is as follows: Assuming that the parts are in the positions shown in Fig. 1, the receiver holder-arm being held down by the weight of the receiver, then on pressing the button to
110 establish the line-connection with the central office and turning the shaft A to generate the signaling-current, the spring 15 from the rotation of said shaft is put under increased compression. The pawl *d*, by its tooth lying
115 against the face of the ratchet at or below the circular line of the bottom of its teeth, is by the centrifugal force and action exerted thereon by the rotating ratchet thrown outwardly and moved, with its shaft, by the spring 20
120 into engagement with the ratchet to prevent the ratchet from being turned in the reverse direction at an undue time. Then on removing the receiver from its holder-arm the latter rises under the action of its retracting-spring
125 39, carrying the bracket 25 and toothed wheel 26 therewith; but, as will be observed in Fig. 1, a tooth of the said wheel being in contact with the post-sleeve 22 on such upward movement of the holder-arm and wheel, the wheel
130 will be swung around the extent of one tooth, the pawl 27 swinging outwardly against its spring to permit of such passage of the tooth by the post. The subscriber having finished

his conversation and on hanging the receiver on the holder-arm therefor, the holder-arm is again depressed, carrying its toothed wheel 26 therewith, and which, being held against rotation backward by its pawl and moving by one of its teeth obliquely across the line of the post-sleeve 22, the said post is forced outward from the said toothed wheel, carrying therewith the slide-shaft D, releasing the pawl *d* from engagement with the magneto driving-shaft A, and permitting the same to then rotate under the recoil of its spring 15, which had been put under compression, as aforesaid, and the movement of the slide-shaft D in a direction away from the ratchet-wheel 16 through the abutment of its stud 32 against the arm of the lever *l* swings such lever on its fulcrum, and by the engagement of its other end with the connecting-rod draws such rod toward the said ratchet 16 and the contact-spring *g* off from the screw *i*, establishing the line-connection with the central-office annunciator.

In practice, under the rotations of the magneto-shaft to call up the central office more or less, according to the habits of various subscribers, the recoil of the spring will always effect a uniform degree of rotation of the magneto-shaft for ringing off, about one complete rotation of said shaft having been effected under a use of the apparatus, and such has been found to afford most practical and satisfactory results. An advantage worthy of note under the use of the automatic ring-off mechanism lies in the fact that, by the uniformity of such ring-off signals and of a duration fractional of the ordinary calling-up signal, the avoidance of confusion to the attendants in the central office will result. Inasmuch as under the increased resistance applied on the receiver holder-arm a greater pressure is required thereon to depress same to effect the freeing of the magneto-shaft A and the establishment of the line-connection, such resistance may be overcome by weighting the receiver or otherwise, one contrivance therefor being illustrated in Fig. 6, in which a compound-lever system is employed. The arm corresponding to the one, E, in Figs. 1 and 2, by a stud, 40, on its end, engages a slot 42, in another lever-arm, G, the latter being pivotally hung by one end on the side of the box B, and has the receiver holding-hook formed on its other end, and all as will be apparent without further description.

What we claim as our invention is—

1. In a telephone-call-box, the combination, with the magneto-operating shaft provided with the ratchet-wheel, the enlarged wall surrounding a portion of said shaft, and the swinging receiver holder-arm, of an involute spring by its inner end secured to said shaft and having its outer end free for a spring-bearing on said wall, substantially as described, and a pawl normally located for engagement with said ratchet-wheel, and means actuated by said holder-arm whereby on the

downward movement thereof said pawl will be thrown out of engagement with said ratchet, for the purpose described.

2. In combination, the magneto-shaft adapted to have a spring-reversed rotation and detent devices adapted normally to prevent such reversal, the short-circuit spring and its contact-pin, the swinging receiver holder-arm, and movable connections actuated by the said holder-arm and in engagement with said arm and said short-circuit spring, and also with said detent devices, whereby on the downward movement of the said holder-arm said spring will be drawn from its contacting pin, and said magneto-shaft will be freed for its reverse rotation, substantially as described.

3. In a telephone-call-box, the combination, with the magneto-operating shaft having the ratchet-wheel thereon, the enlarged surrounding wall, and the swinging receiver holder-arm, of an involute spring by its inner end secured to said shaft, and having its outer end free for a spring-bearing on said wall, a sliding shaft having a spring-pawl thereon normally located for engagement with said ratchet and provided with a stud, 22, and a toothed wheel and spring-pawl therefor carried by said swinging arm and located in relation to said shaft-stud, substantially as described, whereby on the upward movement of the said holder-arm said toothed wheel will produce no effect on said slide-shaft, but on the downward movement thereof said shaft will be moved longitudinally to carry said pawl out of a position for engagement with said ratchet, substantially as described.

4. The combination, with the magneto-shaft having the ratchet, the surrounding circular wall and the involute spring, substantially as described, and the holder-arm, of the slide-shaft having the stud 22 and pin 18 thereon, and guiding-lugs therefor, the pawl loosely fitted on the end portion of the slide-shaft, having the slot 19 engaging said slide-shaft, the spiral spring 20, applied between and secured to a guide-lug and said pawl for exerting an outward pressure on said pawl and slide-shaft, and a pressure on said pawl for a partial rotation thereof on its shaft, and the toothed wheel and spring-pawl therefor carried by said holder-arm and arranged for operation on and with relation to said shaft-stud 22, substantially as and for the purpose described.

5. The combination, with the guiding-lugs *a* and *b*, the latter having the right-angled extension with the longitudinal slot therein, of the slide-shaft D, for carrying the spring-pawl provided with the pin 23, and the sleeves 21 and 22, the former bearing on the walls of said slot, substantially as and for the purposes described.

6. The combination, with the short-circuit contact-spring *g* and the contacting part *i* therefor, and the swinging receiver holder-arm, of the slide-shaft D, having an abutment, 32, mechanism, substantially as described, inter-

posed between said holder-arm and said slide-shaft to secure a longitudinal slide of the latter on the downward movement of the former, an intermediately-pivoted tilting lever having
5 one end in engagement with said abutment for being swung thereby, and a connecting-rod between the other end of said lever and said contact-spring *g*, for drawing same away
10 from its contacting part on the swinging of said lever in one direction, substantially as described.

7. The combination, with the contact-spring *g*, having an aperture, 37, therein, and the tilting lever *l*, intermediately pivoted and having
15 an aperture, 34, in one arm thereof, of the connecting-rod *m*, by one end portion passing through the spring-aperture 37 and headed thereat, and at its other end portion passing through the lever-arm aperture 34 and screw-
20 threaded, and the adjusting check-nut 35, substantially as and for the purposes described.

8. In a telephone call-box, the magneto-shaft A, provided with the ratchet-wheel and the enlarged circular wall surrounding a por-

tion of said shaft, the involute spring by its 25 inner end secured to said shaft, and by its outer end in spring bearing on said wall, the swinging receiver holder-arm, and the short-circuit contact-spring *g* and its contacting button *i*, combined with a sliding shaft having 30 a spring-pawl normally located for engagement with said ratchet and provided with a stud, 22, and abutment 32, a toothed wheel and spring-pawl therefor carried by said swinging arm and located in relation to said 35 shaft for the operation on said slide-shaft, as described, an intermediately-pivoted tilting lever, *l*, by one arm in position to be engaged by said slide-rod abutment 32, and a connect-
40 ing-rod, *m*, between and in engagement with the other arm of said lever and said contact-spring *g*, all substantially as and for the purpose described.

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