

(No Model.)

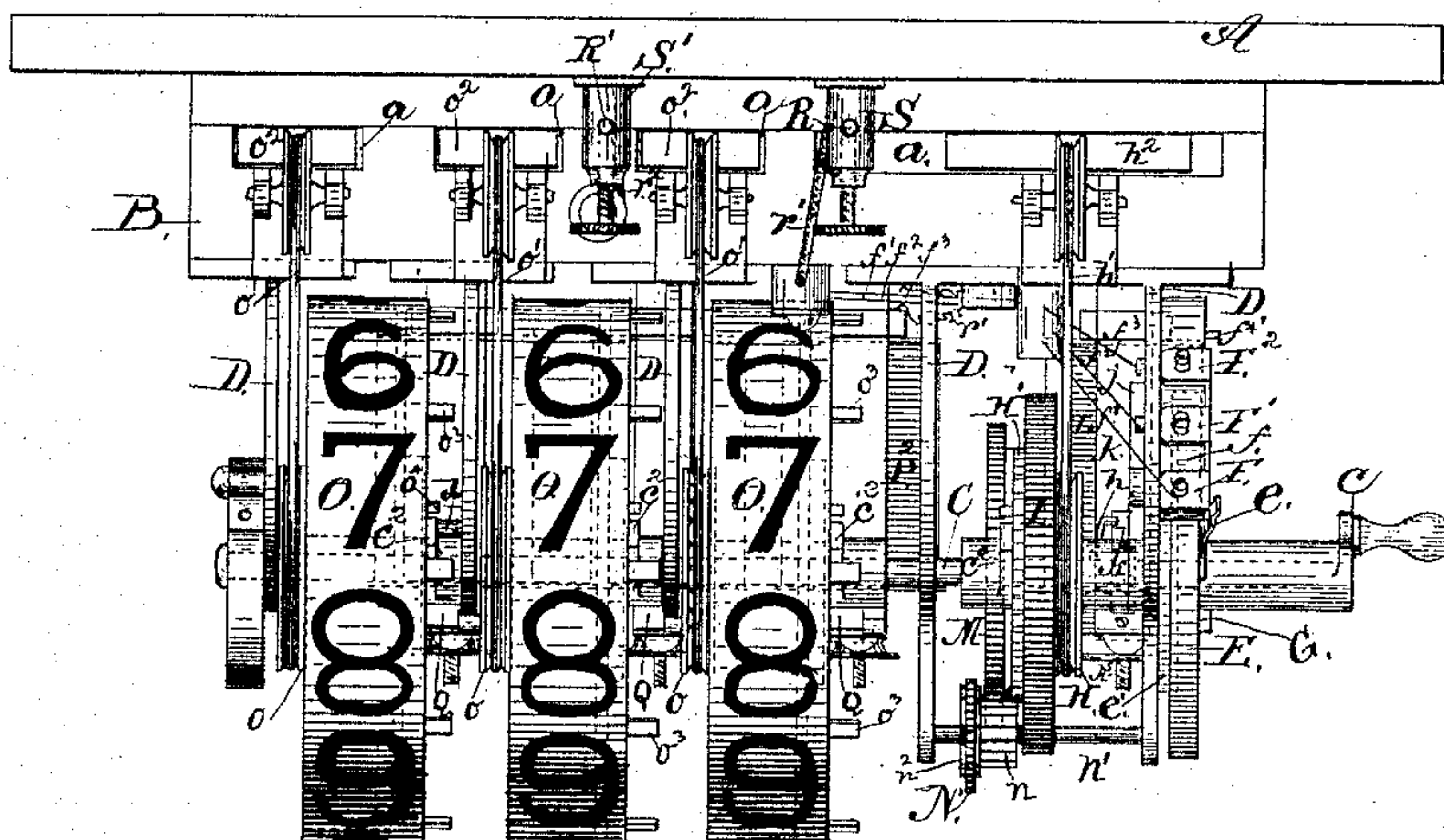
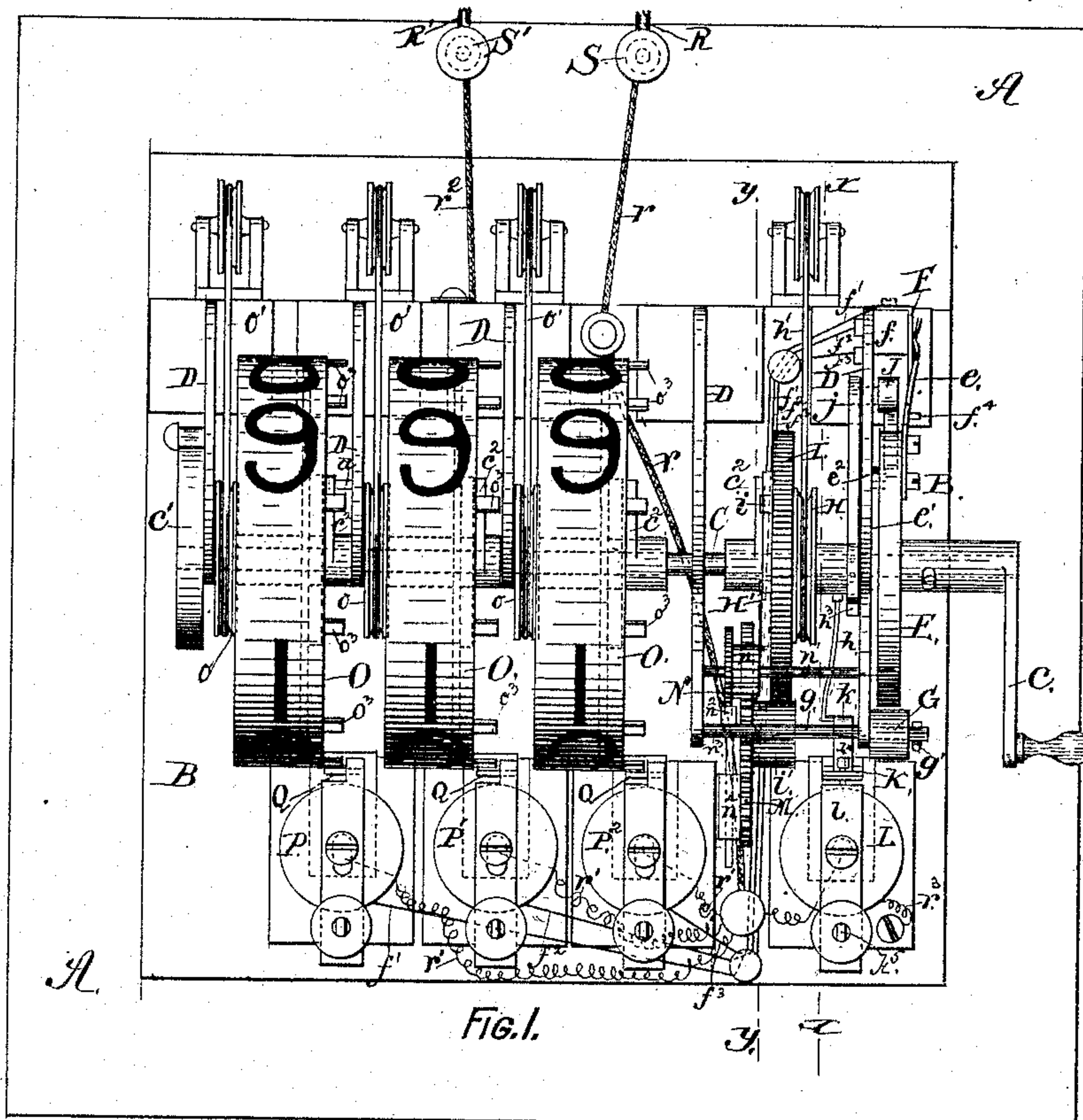
3 Sheets—Sheet 1.

W. J. CULL & C. F. SCATTERGOOD.

ELECTRICAL NUMBER INDICATOR.

No. 354,505.

Patented Dec. 14, 1886.



Witnesses:

S. B. Brewer.
W. M. Brown

Inventors:

WILLIAM J. CULL
and
CHARLES F. SCATTERGOOD

William H. Low,
attorney

(No Model.)

3 Sheets—Sheet 2.

W. J. CULL & C. F. SCATTERGOOD.

ELECTRICAL NUMBER INDICATOR.

No. 354,505.

Patented Dec. 14, 1886.

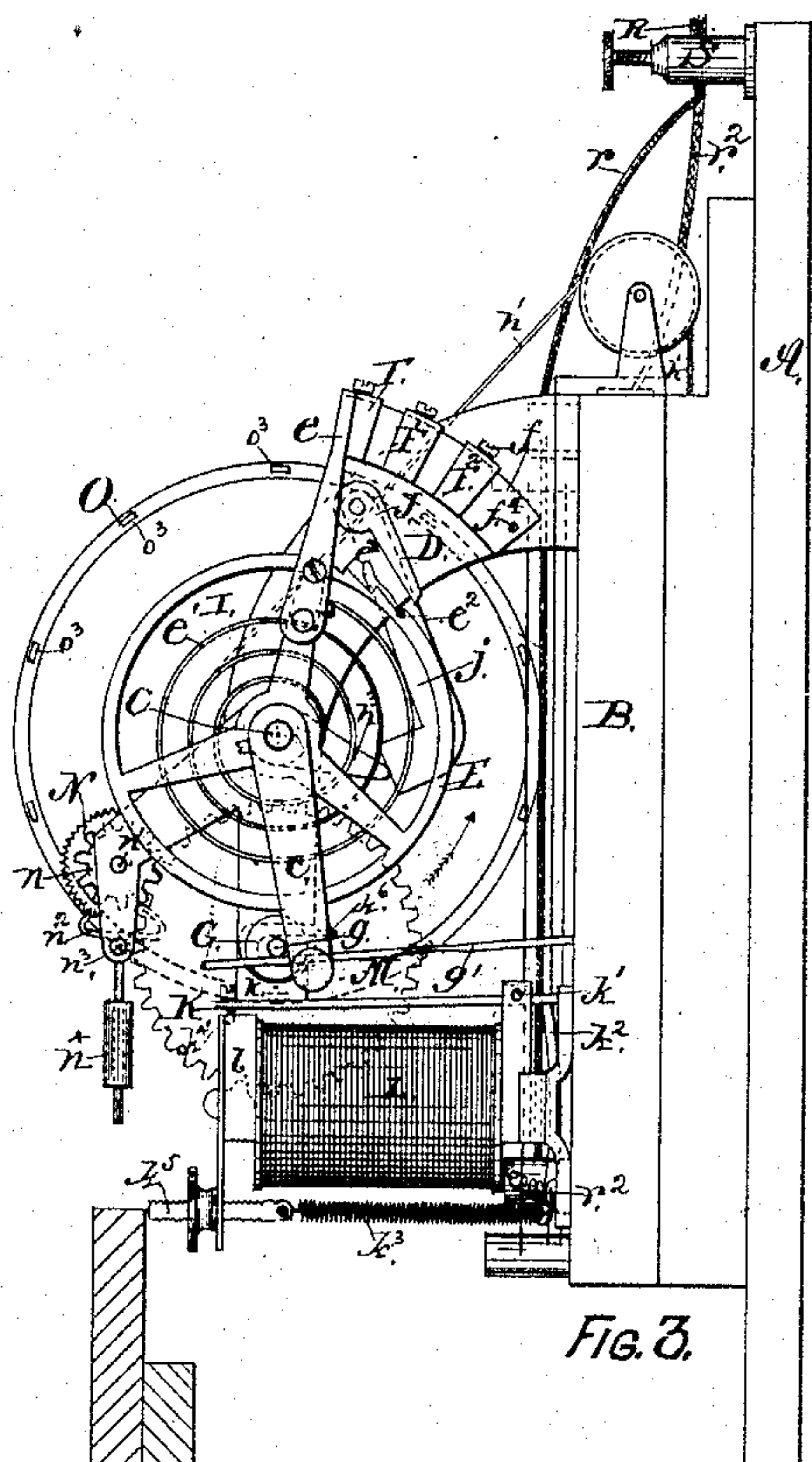


FIG. 3.

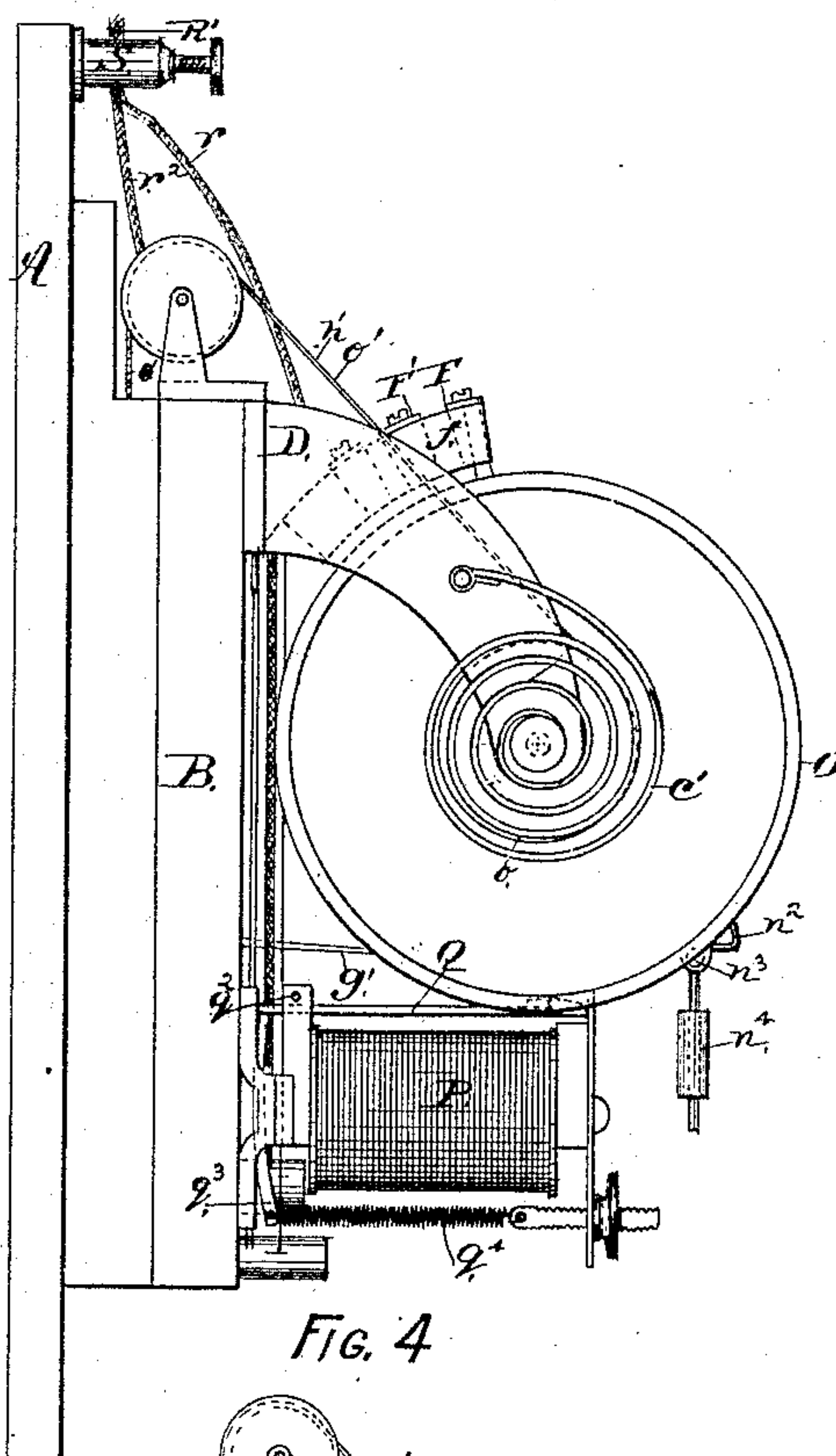


FIG. 4.

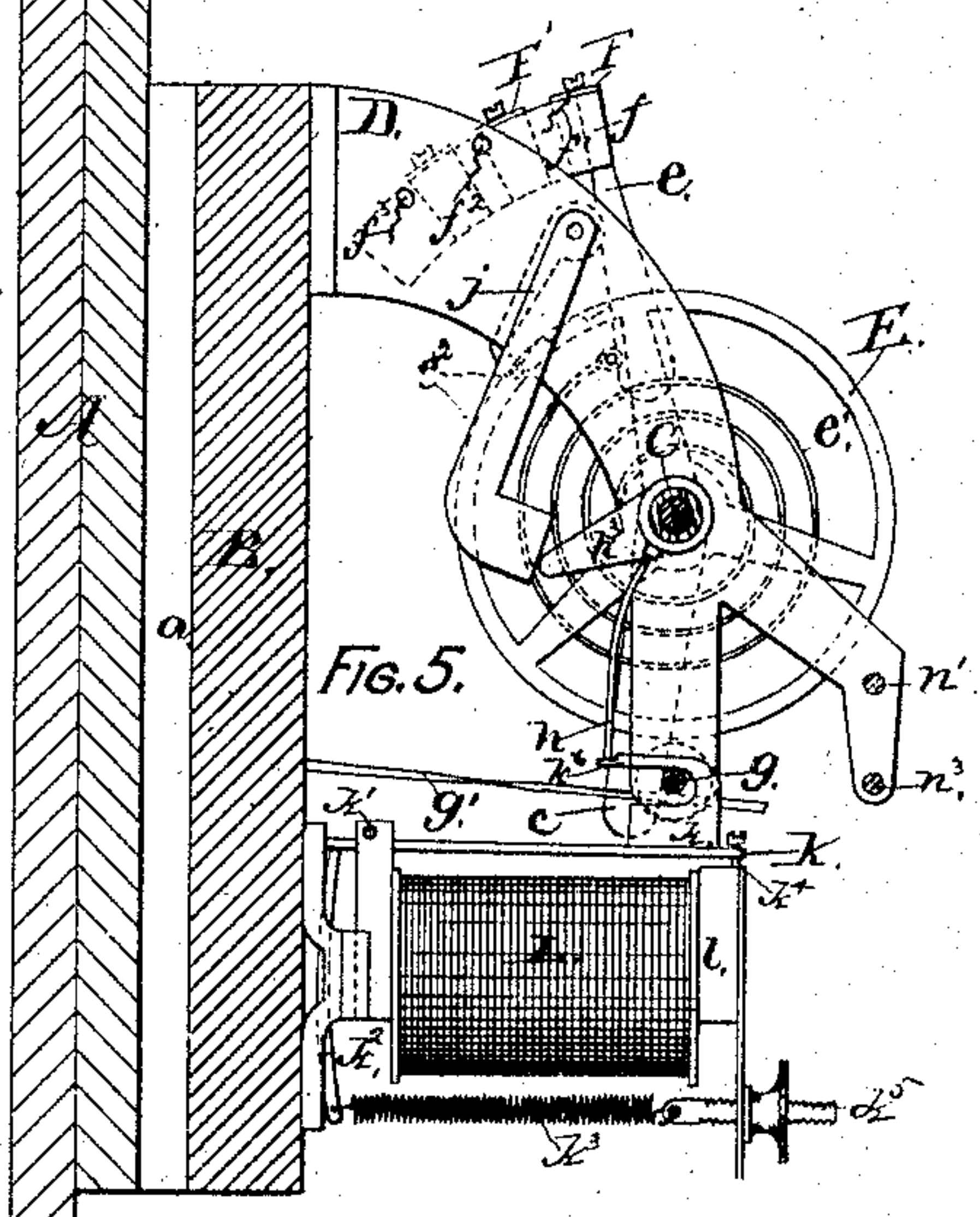


FIG. 5.

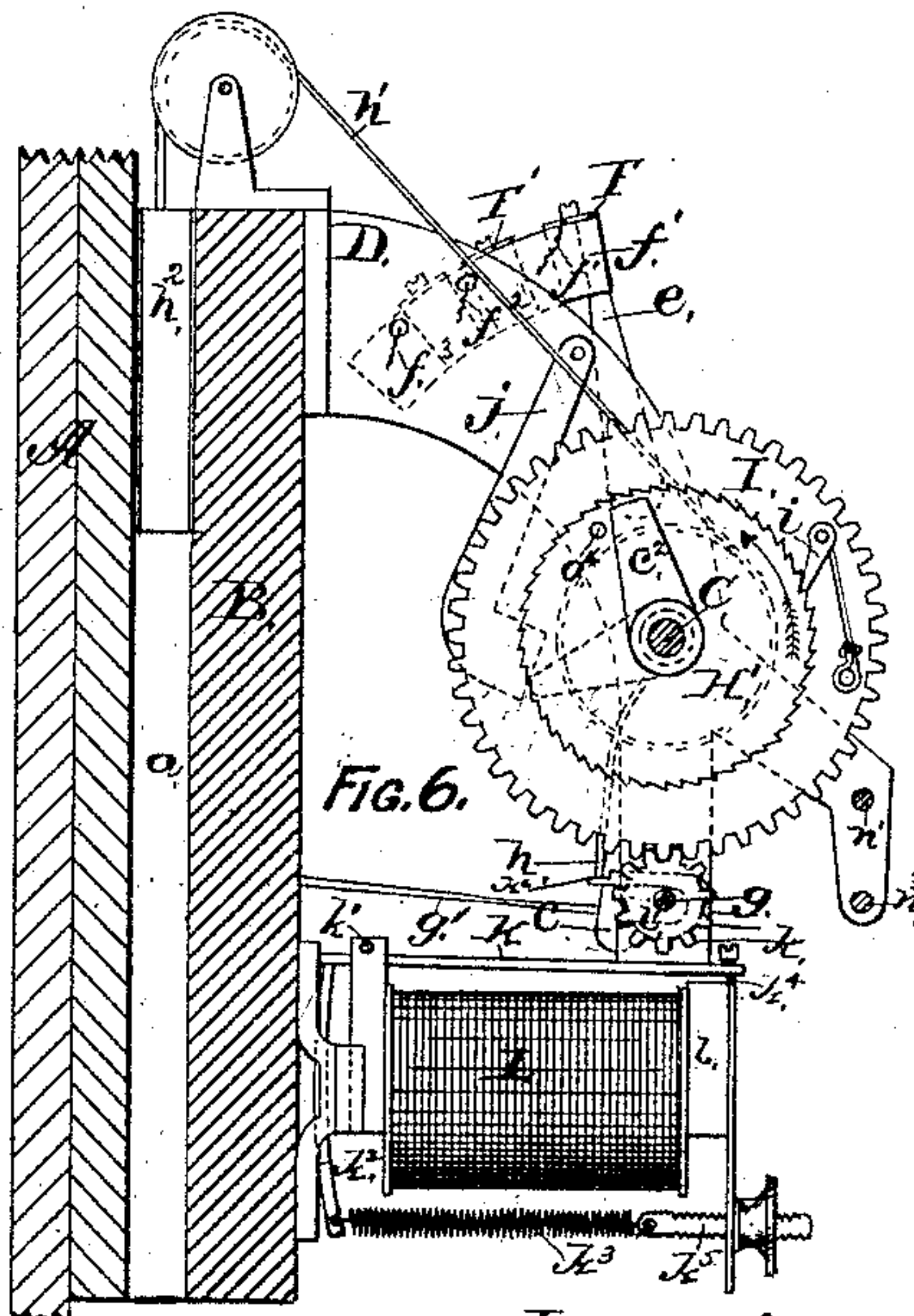


FIG. 6.

Witnesses:

S. B. Brewster,
W. M. Brown

Inventors:

WILLIAM J. CULL,
and
CHARLES F. SCATTERGOOD

William H. Low,
attorney

3 Sheets—Sheet 3.

ELECTRICAL NUMBER INDICATOR.

Patented Dec. 14, 1886.



W. M. Brown

by

William H. Low,
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM J. CULL AND CHARLES F. SCATTERGOOD, OF ALBANY, NEW YORK;
SAID SCATTERGOOD ASSIGNOR TO SAID CULL.

ELECTRICAL NUMBER-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 354,505, dated December 14, 1886.

Application filed May 25, 1886. Serial No. 203,184. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. CULL and CHARLES F. SCATTERGOOD, both of the city and county of Albany, in the State of New York, have invented a new and useful Electrical Number-Indicator, of which the following is a specification.

Our invention relates to an apparatus that is adapted for use in an electrical system of fire-alarms, and which is designed to automatically indicate in a visible manner at a central office, fire-apparatus houses, and other required points or stations the number of a station-box from which a fire-alarm has been sounded.

The object of our invention is to provide means for visibly and unmistakably presenting the number of the station-box from which the alarm of fire emanates. This object we attain by means of the mechanism illustrated in the accompanying drawings, which, being herein referred to, form part of this specification, and in which—

Figure 1 is a front elevation of our indicator with the outer case removed; Fig. 2, a plan view of same; Figs. 3 and 4, end elevations of same from opposite directions; Figs. 5 and 6, vertical sections of Fig. 1, taken through the lines xx and yy , respectively; Figs. 7 and 8, enlarged vertical sections through the line zz on Fig. 1, and Fig. 9 a front elevation of our indicator inclosed in its outer case.

As represented in the drawings, A is the back piece, of wood or other non-conductor of electricity, to which the apparatus is attached.

B is a metallic sole-plate, attached to the back piece, A, in such manner that pockets a will be formed between said sole-plate and back piece for the purpose of containing the actuating-weights.

C is a shaft carried in the brackets D, which are fixed to the sole-plate B. Said shaft is held normally in a stationary position, but is capable of being rotated about one revolution by means of the crank c in the direction indicated by the arrow marked thereon in Fig. 3, and for a purpose hereinafter explained. A spring, c' , fixed to one end of the shaft C carries said shaft back to its normal position, where, as shown in Figs. 7 and 8, one

of the arms c^2 , secured to said shaft, will strike a stop, d , (fixed in one of the brackets D,) to prevent said shaft from being rotated too far by the action of the spring c' .

E is a wheel loosely fitted to the shaft C, so as to have a partial rotative movement independently of said shaft. Said wheel has a radial contact-spring, e , secured thereto, and which extends to contact-points F, F', and F'', secured to an insulating-block, f , which is fixed to the bracket D nearest said wheel. A coil-spring, e' , is attached to the wheel E, and is connected to the nearest bracket D in such manner that when the wheel E is uncontrolled by other parts of the mechanism said wheel will be turned to move the contact-spring e upon or toward the outer contact-point, F. The wheel E is provided with a stop-pin, e^2 , which strikes against the edge of the bracket, and prevents the contact-spring e from being moved beyond the outer contact-point, F, by the action of the spring e' .

G is a friction-pinion, which is arranged to bear intermittently against the periphery of the wheel E, and which, when the apparatus is not in use, but is in condition for use, is held out of contact with said wheel by means of an arm, h , (hereinafter described,) which depresses the outer end of the shaft g , to which the friction-pinion G is fixed. The outer end of the shaft g rests upon a spring, g' , which, when the arm h releases the shaft g by means of a controlling-magnet, as hereinafter explained, forces the friction-pinion G into contact with the wheel E.

H is a sheave which is fitted loosely on the shaft C, and is secured to the hub of a ratchet-wheel, H'. A gear-wheel, I, is loosely fitted on the hub of the sheave H, between said sheave and ratchet-wheel H', so that the sheave and ratchet-wheel may have a rotative movement without affecting the wheel I. A spring-pawl, i , on said wheel engages in the teeth of the ratchet-wheel H', to connect the latter to the wheel I, so that when the ratchet-wheel is moved in one direction (indicated by the arrow marked thereon in Fig. 6) the sheave H, ratchet-wheel H', and gear-wheel I will move as one piece. The sheave H is connected by the cord h' to a weight, h^2 , by which the wheel I is set in motion as soon as the arm h is re-

leased from its engagement with a catch-piece, k , which passes over the shaft g and holds the latter down against the pressure of the spring g' .

The wheel E has in its periphery three notches, e^2 , which are correspondingly arranged to the location of the contact-points, so as to bring the contact-spring e in contact with the contact-point to which any one of said notches is appropriated. A detent, J, is pivoted to the outer bracket, D, and is arranged to be engaged in the notches e^2 , so as to check the motion of the wheel at any point where said notches are located and prevent the contact-spring e from returning to any contact-point it has just passed off of.

The detent J is connected to an arm, j , at the opposite side of the bracket in such manner that said detent and arm will always move as one piece. Said detent is raised from the last notch e^2 in which it has engaged by means of a cam, h^3 , which is attached to the hub of the sheave H, and which, when said sheave has nearly completed its movement in raising the weight h^2 , strikes the lower end of the arm j and swings it backward, thereby swinging the detents J to clear the notch in which it may then be engaged. The gear-wheel I meshes into a pinion, i' , on the shaft g , which carries the friction-pinion G, so that when the arm h is released from the catch-piece k the weight h^2 , acting through the sheave H, wheel I, and pinion i' , will cause the friction-pinion G to rotate the wheel E so long as the pinion G is kept in frictional contact with said wheel. The catch-piece k is attached to an armature, K, which is pivoted at k' , and is provided with a pendent arm, k^2 , to which a spring, k^3 , is connected, to normally keep the outer end of said armature in its elevated position, where a check-screw, k^4 , engages it and prevents it from rising too far. The spring k^3 is also connected to a tension-screw, k^5 , by which the tension of said spring can be regulated. The catch-piece k is provided with a shoulder, k^6 , which forms a stop for the arm h and prevents the latter from being prematurely moved from the catch-piece k .

L is an electro-magnet attached to the sole-plate B, and having an arm, l , of its core projecting upward toward the armature K.

M is a gear-wheel secured to the shaft g , and meshing into a pinion, h , that is secured to the shaft n' , and to which the escapement-wheel N is also secured. The escapement-anchor n^2 is secured to the rock-shaft n^3 , and to the latter a small pendulum, n^4 , is attached, for the purpose of retarding the rate of speed of the train of gearing hereinbefore described.

O represents number-wheels, of which there may be two or more, as occasion requires. The periphery of each wheel is divided into ten spaces, and in each one of nine of said spaces a different number is placed, the numbers being arranged in their regular succession, and the tenth space may either be left blank, as shown in the drawings, or be occupied by a cipher, as may be preferred. Said wheels are

loosely fitted on the shaft C, and each is provided with a sheave, o , to which a cord, o' , is attached, for the purpose of connecting each wheel with its actuating-weight o^2 , by which the wheel is rotated in a direction that will successively bring each number in its order at the front of the apparatus. At one edge of each of said wheels ten spurs, o^3 , are formed to project laterally therefrom, one of said spurs being appropriated to each one of the peripheral divisions of the wheel on which it is made.

P, P', and P² are electro-magnets for effecting the releasement of the number-wheels O, one of said electro-magnets being appropriated to and located adjacent to each of said number-wheels. Each of the last-named electro-magnets has an armature, Q, pivoted as at q^2 , and provided with a pendent arm, q^3 , to which a spring, q^4 , is attached to move the outer end of said armature upward. The outer end of each armature has a stop, q , that is beveled downwardly on its upper face, and against which some one of the spurs o^3 will always be engaged whenever the armature is raised to its highest position by its spring q^4 . Just inside of the stop q a hook-formed check, q' , is made on said armature, but is elevated at such a distance above the upper face thereof that said check will, when the armature is depressed, as shown in Fig. 7, lie directly in the path of the spurs o^3 and momentarily stop the movement of the number-wheel. Sufficient space is left between the lower edge of the check q' and the upper face of the armature Q to permit the spurs o^3 to pass through when said armature is raised to its elevated position, and as the armature rises the check q' slips off from the spur with which it is engaged, and the spur, passing underneath the hook-formed check q' , then engages with the stop q , as shown in Fig. 8, by which catch the number-wheel is stopped until the armature Q is depressed to permit the engaged spur to escape from the stop q and allow the next spur to come in contact with the check q' , to produce a repetition of the operation above described.

The number-wheels O are each provided with a stud, o^4 , against which the arms e^2 (that are secured to the shaft C) engage when said shaft is turned by the crank c in the direction hereinbefore described, for the purpose of setting the number-wheels back to a position where all the blank spaces will be brought to the front. To effect this purpose the shaft C must be provided with a number of arms, e^2 , that will equal the number of number-wheels O on said shaft, and in turning back the shaft C the arm e^2 appropriated to any one of the wheels, as soon as said arm reaches the point where the stud o^4 of its appropriate wheel may be at the time, will engage with said stud and cause said wheel to turn backward until the movement of the shaft is arrested by the stud d , at which time all of the number-wheels O will have been turned backward to bring their blank spaces in front, as shown in Fig. 1.

It should be understood that, in whatever

order the number-wheels may be left to indicate any particular station, each of the arms e^2 will engage its proper stud, o^4 , at the proper moment to bring the same ordinals on each wheel to range in the same lines at the termination of the backward movement of the shaft C.

The apparatus is connected to the line-wires of an electrical circuit, of which the positive wire R is connected to the binding-post S, which connects, by means of the insulated wires r and r' , with one side of all the electro-magnets L and P. The other or negative line-wire, R' , is connected to the binding-post S' , which connects, by means of the insulated wire r^2 , to the metallic sole-plate B, to which the electro-magnet L is electrically connected by the wire r^3 , so that the electrical connection through said magnet will always be in condition for the flow of the current. The electro-magnets P, P' , and P^2 are respectively connected to the contact-points F, F' , and F^2 by the insulated wires f' , f^2 , and f^3 . In the line-wire R the electrical circuit is closed and opened, in the usual manner, by a station-box or call-box so constructed that it will automatically transmit the required number of electrical impulses to designate each digit of the number to be shown by the several number-wheels of the indicator, with a break in the circuit between the impulses required for each digit.

The operation of the apparatus will be understood by the following: The wheel E being set with its contact-spring e to bear on the contact-point F, so that the electrical circuit can be closed through the electro-magnet P and the number-wheels O with their blank spaces at the front, in which condition the weights h^2 and o^2 will be raised to their highest point and the detent J raised out of the notches in the wheel E, let it be supposed that a call issounded from station-box 234. The armature K will be drawn down by the first impulse to release the arm h from the catch-piece k , so as to bring the friction-pinion G into contact with the wheel E and start the latter in motion to carry the contact-spring e rearwardly, and at the same instant the armature of the electro-magnet P is depressed to release the first number-wheel and bring the figure 1 on said wheel to the front. Before the contact-spring e has reached the contact-point F' a second impulse again releases the friction-pinion G from the wheel E, thereby permitting the spring e^2 to turn the wheel E and restore the contact-spring e to the point from which it started. The second impulse also again releases the first number-wheel, to permit the figure 2 on said wheel to come to the front. During the longer interval which always occurs after the completion of the number of impulses required to express each digit of the number to be shown on the indicator, the contact-spring e is carried backward onto the contact-point F' , (the detent J, by entering the

first notch e^2 , preventing the spring e' from returning the contact-spring e to the contact-point F,) and at each impulse, while said contact-spring is bearing against the contact-point F' , the electric current will pass through the electro-magnet P' to release the second number-wheel, in the manner above described, until the required digit on that wheel is brought to the front, and, after the second prolonged interval has passed, the contact-spring e will finally pass onto the contact-point F^2 , to pass the current through the electro-magnet P^2 and effect the setting of the third number-wheel in the manner previously described in regard to the first number-wheel. When the last required digit on the third number-wheel is brought forward, the contact-spring e passes backward off from the contact-point F^2 and rests against the stop-pin f^4 until the crank c is turned to reset the several parts in position as first described.

When occasion requires, the first one or the first two number-wheels may be used to express a number of less than three digits, and in such cases, as soon as the number is completed, the contact-spring will pass backward to rest against the stop-pin f^4 , it being understood that as the number-wheels can only be moved by each impulse created by the closing of the circuit by means of the station-box, it follows that in the absence of such impulses the contact-spring can be passed over the contact-points without producing any effect on the number-wheels.

We claim as our invention—

1. The combination, with a normally stationary shaft having a spring fixed thereto to restore it to its normal or stationary position, and having a series of arms rigidly fixed thereon, of a series of number-wheels loosely fitted on said shaft and adapted to be freely rotated thereon by means of weights or other equivalent devices, each of said number-wheels being provided with a stud which will engage with its appropriate arm on said shaft when the latter is turned to restore said number-wheels to their zero positions, as herein set forth.

2. The combination, with an automatic electrical cut-out consisting of an oscillating wheel provided with a contact-spring, a series of contact-points, each of which is electrically connected to its appropriate electro-magnet for controlling the number-wheels, a clock mechanism for producing the movements of said oscillating wheel in one direction, and an electro-magnet and armature, by which said clock mechanism is automatically connected and disconnected with said oscillating wheel, of a series of number-wheels connected to weights or other equivalent operating devices, and provided with spurs which correspond to the number-spaces of said wheels, and a series of electro-magnets equal to the number-wheels, each of which is electrically connected to its appropriate contact-point of the auto-

matic cut-out and provided with an armature, by which said number-wheel is released and stopped, as herein specified.

3. The herein-described automatic electrical cut out, consisting of an oscillating wheel provided with a contact-spring that is adapted to successively form electrical contact with each of a series of contact-points that are insulated from each other, the said oscillating wheel being actuated in one direction by means of a pinion that is intermittently connected therewith, and in the other direction by means of a spring, as and for the purpose herein specified.

4. The combination, with a number-wheel, O, having projecting spurs o^3 , of an electro-magnet having an armature, Q, provided with a stop, q , and check q' , and arranged in relation to said number-wheel, to operate as herein specified.

5. The combination, with the electro-magnet L and the armature K, provided with the catch-piece k , of the arm h , operated by means of the shaft C, and adapted to engage with the catch-piece k to depress the armature K, as and for the purpose specified.

6. The combination, with an oscillating wheel, E, provided with peripheral notches e^2 , and a detent, J, adapted to engage in the notches e^2 , and connected to an arm, j , of the cam h^3 , adapted to release the detent J from the wheel E, as and for the purpose specified.

WILLIAM J. CULL.
CHARLES F. SCATTERGOOD.

Witnesses:

WM. H. LOW,
S. B. BREWER.