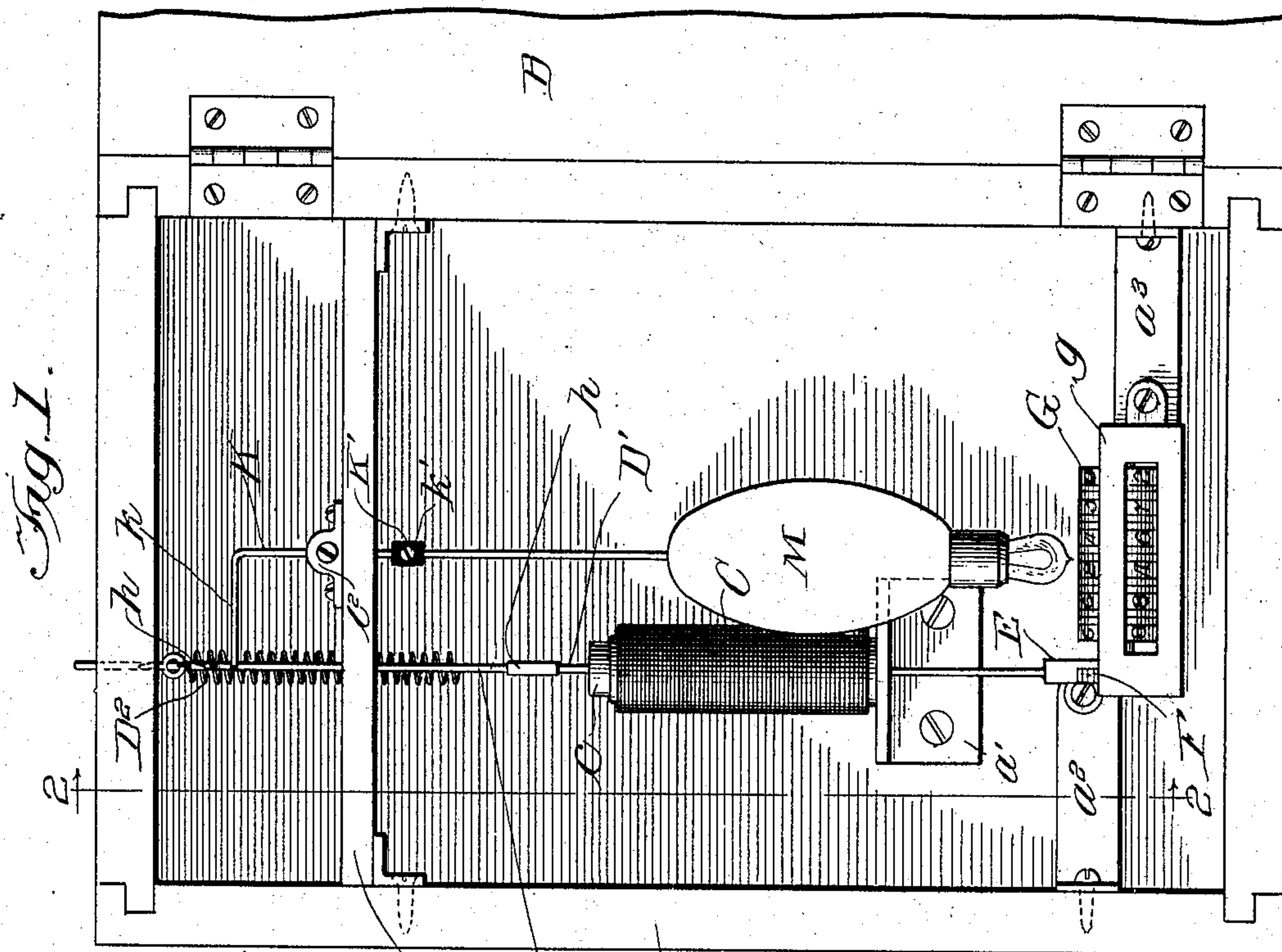
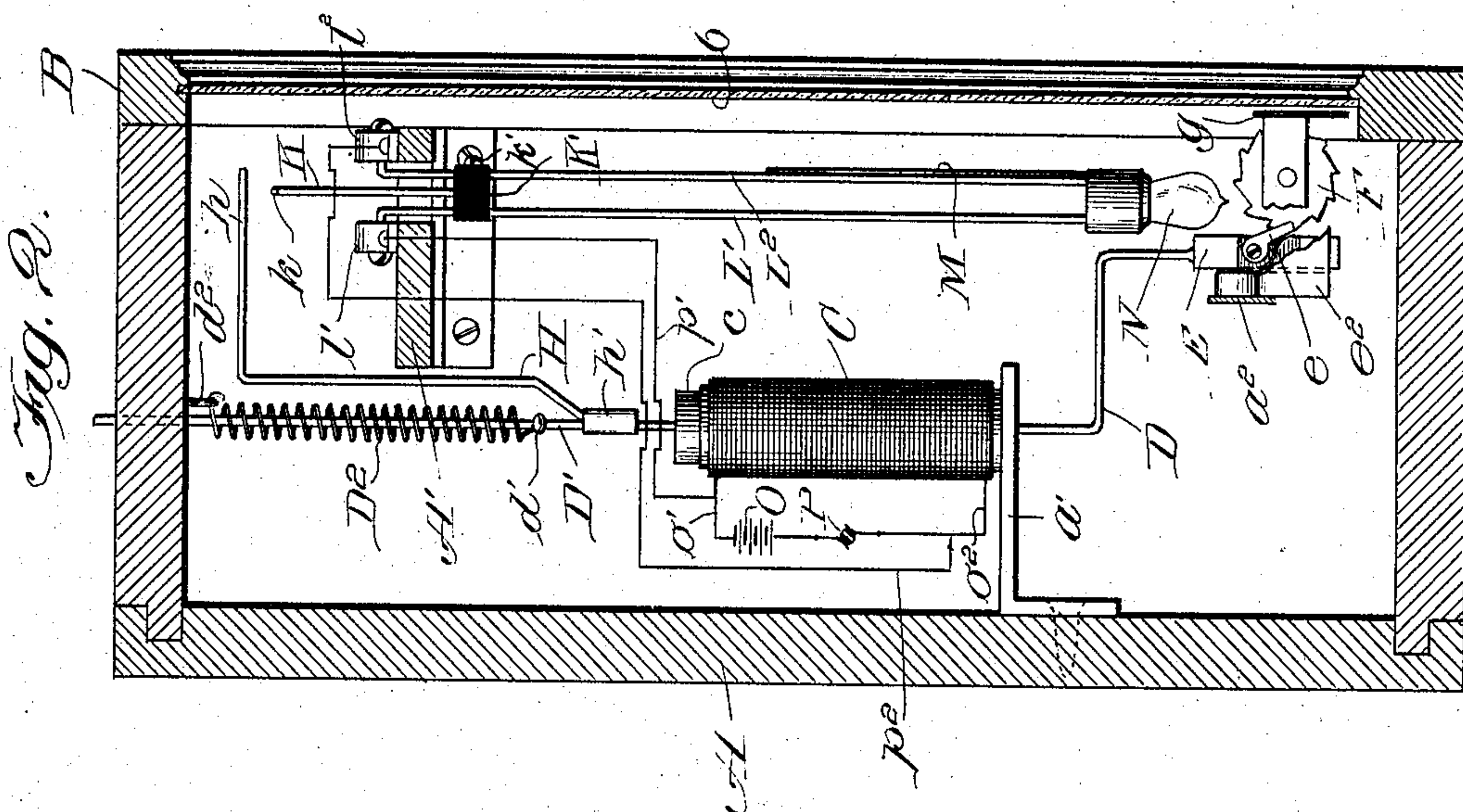


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W. STARKEY.
ELECTRIC SIGNALING INDICATOR.

APPLICATION FILED FEB. 6, 1905.



Witnesses:
H. S. Gaither
C. A. Mullen

Inventor:
William Starkey
by Chamberlain Wilkinson
Attys

UNITED STATES PATENT OFFICE.

WILLIAM STARKEY, OF CHICAGO, ILLINOIS.

ELECTRIC SIGNALING INDICATOR.

SPECIFICATION forming part of Letters Patent No. 791,114, dated May 30, 1905.

Application filed February 6, 1905. Serial No. 244,320.

To all whom it may concern:

Be it known that I, WILLIAM STARKEY, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Electric Signaling Indicators; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to electric signaling indicators, and more particularly to a device for registering and simultaneously indicating both by movable target and by a flash of light the operation of any desired machinery or the movement of a given apparatus.

It is frequently desirable that the revolutions, reciprocations, or other movements of a distant or inaccessible apparatus—such as mining-pumps, water-meters, mining-cars, &c.—should be indicated at some predetermined place and the number of the reciprocations, revolutions, or movements of the apparatus recorded.

The primary object of my invention is to provide a combined electric indicator and registering device which may be located at any convenient point where it may be readily inspected and which will both indicate that a given apparatus is in operation and also record the extent of such operation.

A further object of my invention is to provide an electric signaling indicator which will be simple in construction, inexpensive in manufacture, and efficient in operation.

The embodiment of my invention herein disclosed may be generally described as consisting in an electromagnet, a registering device operatively connected to said magnet, a movable target supported by two rods, a lamp carried by said target, the filament of which is in series with said supporting-rods, means interposed between said magnet and said target for moving the latter, and means actuated by the operation of any given apparatus for making and breaking the circuits through said magnet and simultaneously through said lamp, whereby the operation of said appa-

ratus is registered and simultaneously indicated both by the movement of the target and flash of the lamp.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical form, and in which—

Figure 1 is a front elevational view, and Fig. 2 a sectional view on line 2 2, Fig. 1.

The same reference characters are used to indicate the same parts in the two figures of the drawings.

Reference-letter A indicates any suitable support for the apparatus in which my invention is embodied and in the present instance is shown as a box.

B indicates a door hinged to the box and provided with a glass front *b*, through which the mechanism within the box is visible.

C indicates an electromagnet of any desired form and of suitable size. In the present instance it is shown as a solenoid within which a plunger or core *c* reciprocates. The solenoid C may be conveniently supported upon a bracket *a'*, secured to the back of the box A. Secured to the core *c* and extending below the same is a rod D, preferably offset, as shown in Fig. 2. The lower end of the rod D is provided with a block E, upon which is mounted a spring-actuated pawl *e*. The block E is adapted to reciprocate in a guide *e'*, supported by a bracket *a''*, projecting from one of the side walls of the box A.

G represents a series of registering-disks of any ordinary construction.

F indicates a ratchet-wheel by means of which the indicating-disks are actuated and which in turn is actuated by the pawl *e*.

g indicates a plate having a slot therethrough into registry with which the numerals on the indicating-disks are brought. The slotted plate *g* may be conveniently supported upon a bracket *a'''*, projecting inwardly from one of the side walls of the box A.

Projecting from and rigidly secured to the end of the plunger *c* opposite to the end from which the rod D projects is a rod D', which may be guided in any suitable manner—as, for instance, by extending the same at its up-

per end through a passage in the top wall of the box A. A coiled spring D^2 surrounds the rod D' and is secured thereto at one end, as shown at d' . The opposite end of the spring
 5 D^2 is connected to a fixed support—such, for instance, as the eye d'' —supported by the top of the box A. A rod H is rigidly secured to the rod D' by any suitable means—such, for instance, as a collar h' . The rod H is pro-
 10 vided with a bent portion h , which projects below the bent portion k of a rod K. The lower end of the rod K is rigidly secured to a block K' , formed of insulating material and supported on two rods L' and L^2 , the latter
 15 being journaled at their upper ends in brackets l' and l^2 . The brackets l' and l^2 may be conveniently supported upon a shelf A' within the box A. An opening is formed through the shelf A to permit the free movement
 20 therethrough of the rod K and the upper ends of the rods L' and L^2 . The block K' is secured in the desired position upon the rods L' and L^2 by means of a clamp-screw k' .

Carried by the rods L' and L^2 is a target or
 25 semaphore M. A lamp—such, for instance, as an incandescent electric lamp N—is carried by the rods L' and L^2 and is preferably located below the target M. The filament of the lamp N is connected in series with the rods
 30 L' and L^2 , the latter serving as electric conductors.

A circuit extends from any desired point to the solenoid C and continues through the coils thereof. The circuit through which the so-
 35 lenoid is energized is controlled by a make-and-break device actuated by the machine or apparatus the operation of which is to be registered and indicated.

I have indicated diagrammatically in Fig.
 40 2 the circuits for energizing the solenoid and for lighting the lamp N.

o and o^2 indicate leads extending from the windings of the solenoid to the point where the apparatus or machinery is located.

45 P indicates a circuit making and breaking device which is operated by the pump, water-meter, or other apparatus.

O indicates a battery within the circuit of the solenoid and which may be located at any
 50 desired point.

The circuit through the lamp N may be traced as follows: battery O, lead o' , lead p' , bracket l' , rod L' to the filament of the lamp, thence to rod L^2 , bracket l^2 , lead p^2 , lead o^2 ,
 55 controller P to the battery O.

The operation of my invention is as follows: The movement of the circuit-controller P intermittently closes the circuit through the magnet, thereby energizing the latter and
 60 causing the plunger to be drawn within the same. The downward movement of the plunger forces downwardly the rod D, through which the engagement of the pawl e with the ratchet F rotates the indicator-disks one unit.
 65 The movement of the plunger also draws

downwardly the rod H and causes the bent portion h thereof to engage the bent end k of the rod K, thereby oscillating the latter. The movement of the rod K swings the target M, thereby indicating that the circuit has been
 70 closed through the solenoid, and consequently disclosing the fact that the apparatus or machinery which actuates the circuit-controller is in operation. The closing of the circuit by the controller P also indicates that the
 75 machinery is in operation by reason of the flash of light produced in the lamp N. Immediately upon the circuit being broken by the controller P the solenoid is no longer energized, and the spring D^2 , which has been
 80 expanded by the movement of the plunger within the solenoid, contracts, thereby elevating the plunger and coincidentally lifting the bent portion h of the rod H out of contact with the bent end of the rod K and also
 85 elevating the carrier E, and with it the pawl e , into engagement with the succeeding tooth on the ratchet F, preparatory to again actuating the register and target upon the solenoid being again energized.

From the foregoing description it will be observed that I have invented an improved combined registering and indicating device by means of which the operation of a distant
 90 or inaccessible apparatus is registered and simultaneously indicated both by a movable target and by a flash of light, thereby not only conveying the information that the machinery or apparatus is in operation, but also
 95 registering the extent of such operation.

It will of course be understood that any form of registering device, such as indicated at G, may be employed and also that other forms of movable targets than the one illustrated may be employed. It is also evident
 100 that numerous forms of electromagnets may be employed to actuate my improvement and that the solenoid is merely shown as a convenient form of such magnet. The lamp may be stationary, if desired, and the target alone
 105 movable.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form,
 110 the proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit of my invention.

Having now fully described my invention, 120 what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described, the combination with an electromagnet, of a movable target, operative connections interposed between said magnet and target, an incandescent lamp carried by said target, circuits for said magnet and lamp, and means for intermittently closing said circuits.

2. In an apparatus of the character de- 130

scribed, the combination with an electromagnet, of a movable target, operative connections interposed between said magnet and target, an electric lamp carried by said target, a circuit for said magnet, two hanger-rods for supporting said target, a circuit for said lamp a part of which consists in said rods, and means for intermittently closing said circuits.

3. In an apparatus of the character described, the combination with an electromagnet, of a movable target, two hanger-rods for supporting said target, operative connections interposed between said magnet and target, an electric lamp carried by said target the filament of which is in series with said rods, a circuit for said magnet, leads extending from said circuit to the hanger-rods thereby connecting said lamp in multiple with said magnet, and means for intermittently closing said circuit.

4. In an apparatus of the character described, the combination with a solenoid, of a

reciprocating plunger within said solenoid, a swinging target, two hanger-rods supporting said target, an incandescent lamp carried by said target, the filament of which is in series with said rods, a bent rod carried by one end of said plunger, a projection on said target extending into the path of movement of said bent rod, a second rod connected to said plunger, a registering device operated by said second rod, a circuit for said solenoid, leads extending from said circuit to said hanger-rods thereby connecting said lamp in multiple with said solenoid, and means for intermittently closing the circuit through said solenoid and lamp.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIAM STARKEY.

Witnesses:

GEO. L. WILKINSON,
C. A. MULLEN.