

(No Model.)

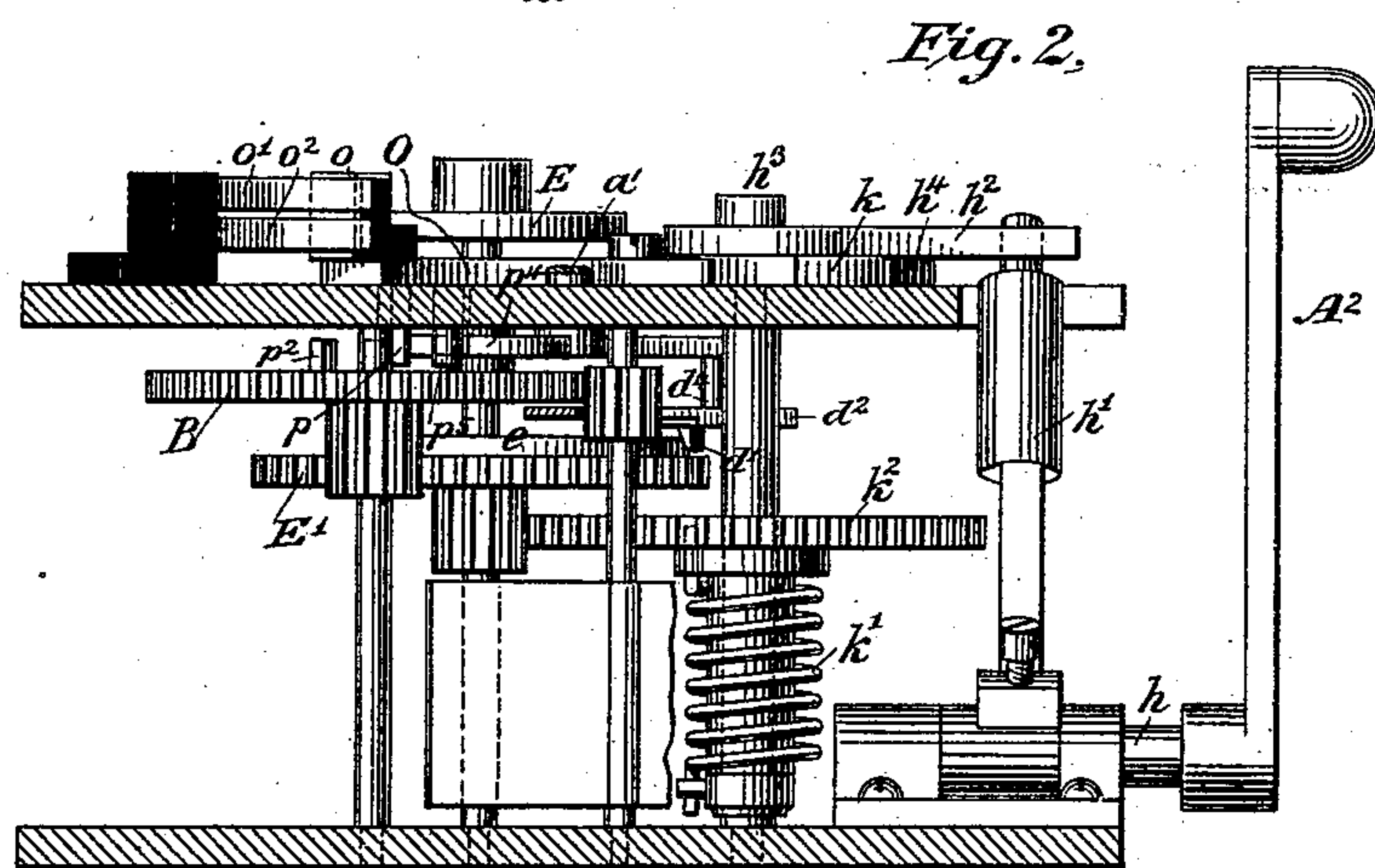
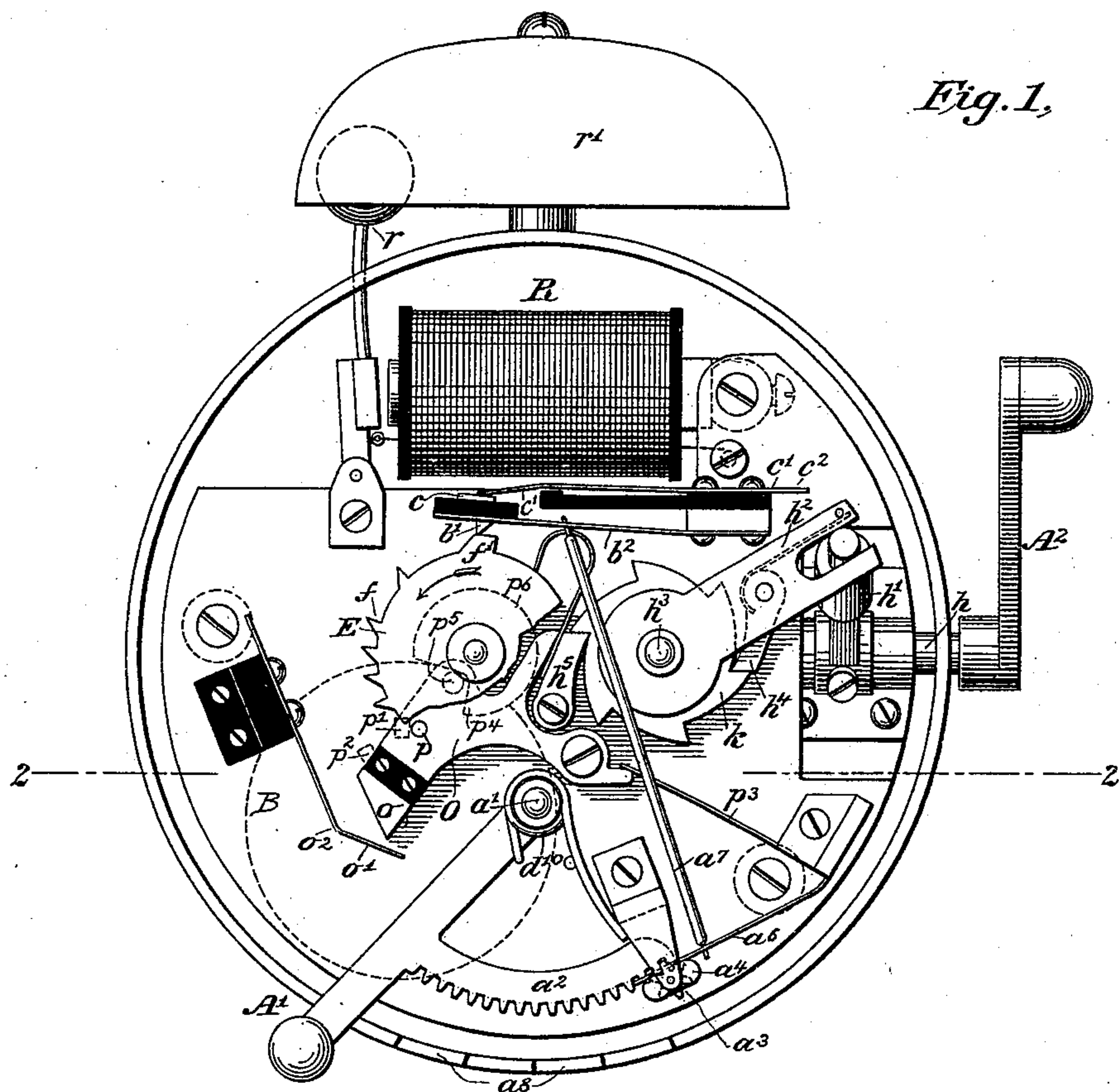
2 Sheets—Sheet 1.

A. MEYER.

SIGNAL BOX.

No. 355,548.

Patented Jan. 4, 1887.



Witnesses

Geo. W. Breck
Caroline C. Davidson

By his Attorneys

Inventor

August Meyer
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

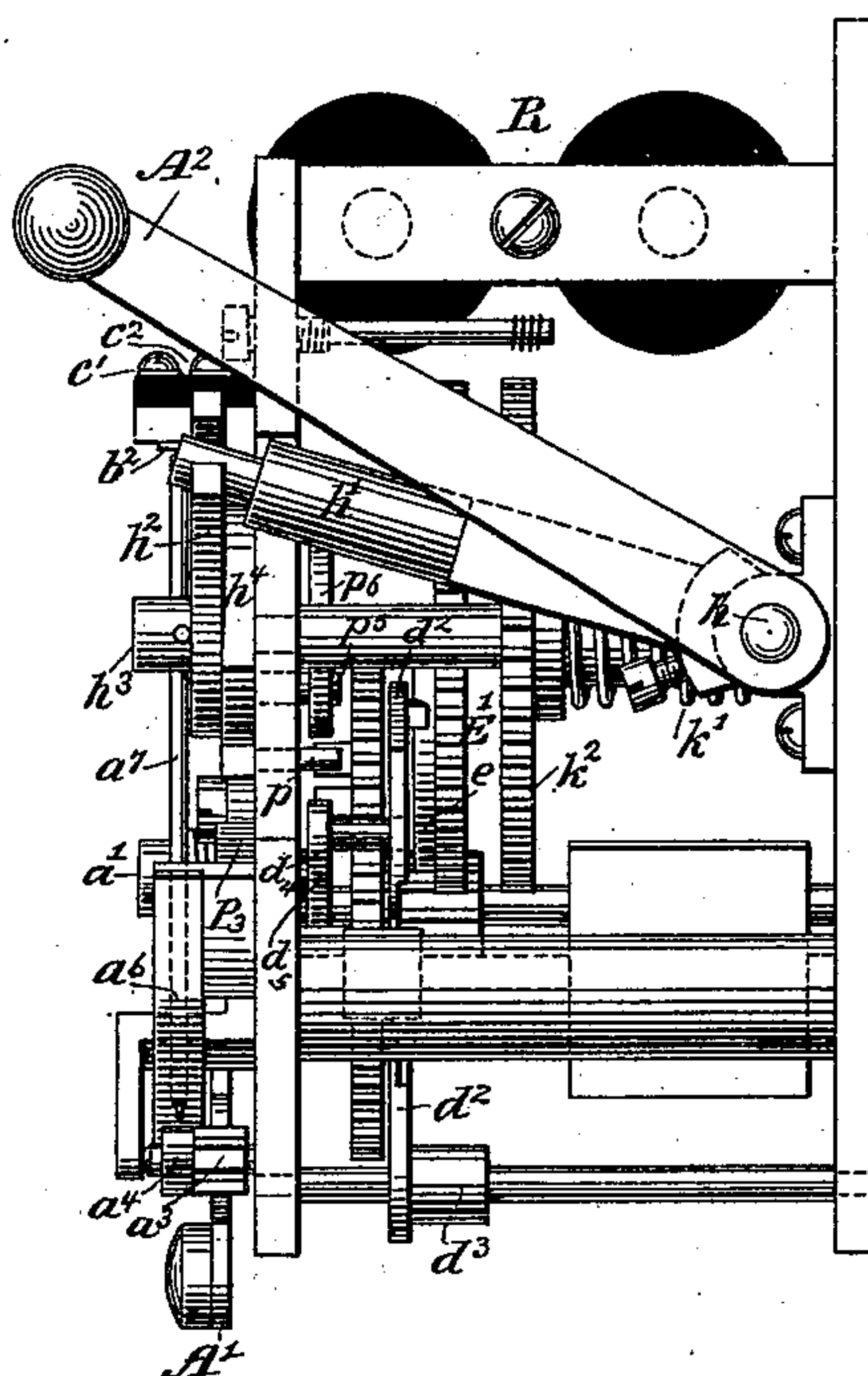


Fig. 3.

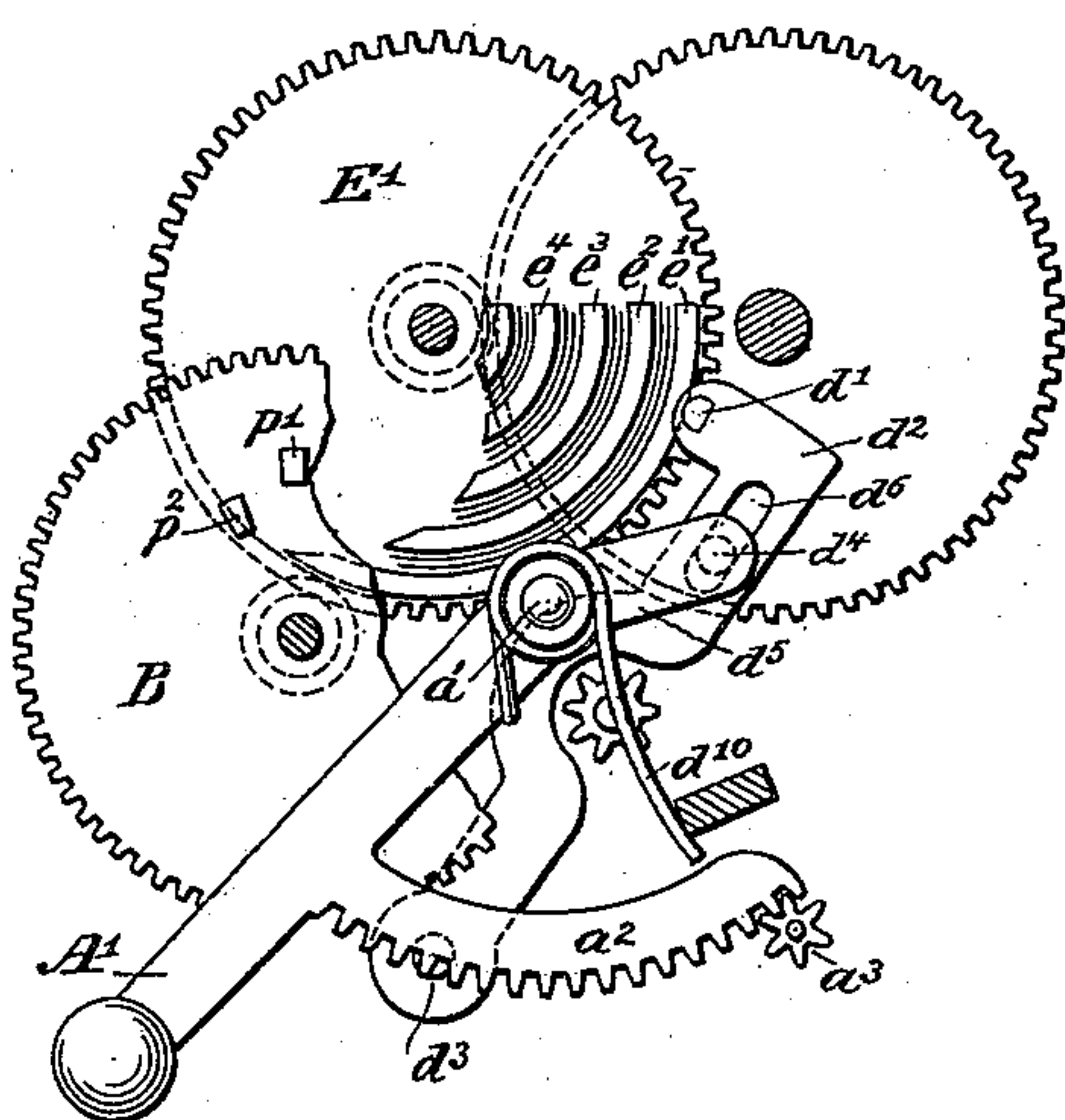
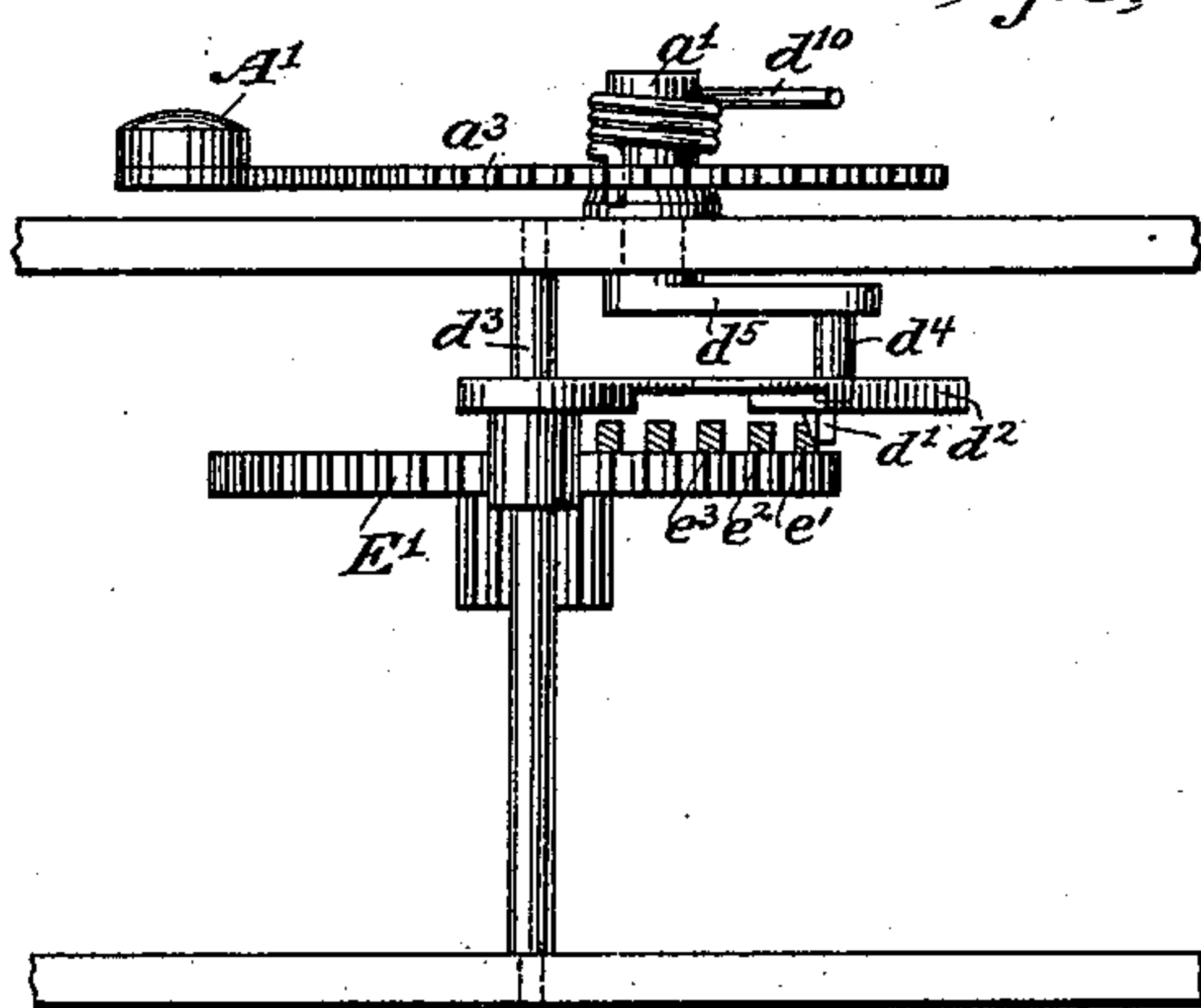


Fig. 5.



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UNITED STATES PATENT OFFICE.

AUGUST MEYER, OF BALTIMORE, MARYLAND, ASSIGNOR TO J. FRANK MORRISON, OF SAME PLACE.

SIGNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 355,548, dated January 4, 1887.

Application filed October 20, 1886. Serial No. 216,709. (No model.)

To all whom it may concern:

Be it known that I, AUGUST MEYER, a citizen of the United States, residing in Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Signal-Boxes, of which the following is a specification.

The invention relates to the class of apparatus employed for transmitting arbitrary signals from sub-stations to a central station or office.

The object of the invention is to provide convenient and efficient apparatus for transmitting any one of several different signals at will for indicating the character of service required and also the number of the district or sub-station where the signal box or transmitter is located, and, further, to provide for signaling back from the central station to the sub-stations.

The invention consists, in general terms, in providing a circuit-closing device with two operating mechanisms, one of which may be set in any one of several positions, and when released serves to send a corresponding number of impulses, while the other is constructed to transmit an arbitrary group or combination of impulses by actuating the circuit-closing device each time the instrument is operated. The two devices are actuated by independent springs and are dependent upon each other to the extent that the variable signaling device is prevented from acting until the group or station signaling device commences to operate, and the movement of the former is to a certain extent controlled by that of the latter.

In the accompanying drawings, Figure 1 is a plan view of the operating mechanism, partly in section, and Fig. 2 is an elevation of the same. Figs. 3 and 5 are details of the want-signaling device, and Fig. 4 is a side view of the apparatus.

Referring to the figures, A' and A^2 represent two handles or arms, designed, respectively, to set the variable or want signaling device and the arbitrary station-signaling device in condition to operate. The handle A' is pivoted upon an arbor, a' , extending through the frame of the instrument. It carries a toothed rack or segment, a^2 , which engages the teeth of a pinion, a^3 . The arbor of this pinion carries a cam, a^4 , shown in this instance with two

widened surfaces. This cam serves, when the pinion is revolved, to drive an arm or spring, a^6 , to and fro. An arm, a^7 , rests at one end in the arm a^6 and extends to a flexible arm, b^2 , which carries an insulated circuit-closing plate, c . The movement of the arm a^6 , occasioned by the revolution of the arbor a^3 , will thus cause the plate c to be thrown into and out of contact with two circuit-closing springs, c' and c^2 , bridging across the same. It will be seen thus that the number of times a circuit is thus completed between the two insulated arms c' and c^2 will be dependent upon the arc through which the arm A' is moved. A scale, a^8 , is provided for determining in which one of several positions the arm A' shall be set for giving the desired signal. As the arm A' is set in position the pinion a^3 will be revolved, and the cam a^4 would actuate the spring b^2 were it not that this spring is during such time pressed toward the contact-springs c' and c^2 , as will hereinafter appear. The turning of the cam against the spring a^6 will, however, give a series of mechanical impulses to the handle, and by means of these it may readily be determined by the person using the box when he has set the handle in the desired position.

When the arm A' is set in position a spring, d^0 , surrounding the arbor a' , tends to return the arm to its normal position; but this movement is prevented by reason of a detent, d' , carried upon an arm, d^2 , which arm is pivoted upon an arbor, d^3 . A pin, d^4 , carried upon an arm, d^5 , extending from the arbor a' , enters a slot, d^6 , formed in the arm d^2 . When the arm A' is moved toward the right hand the pin d^4 moves the arm d^2 toward the axis of the circuit-controlling wheel E , which will be hereinafter described. A wheel, E' , upon the same shaft has a series of curved lugs, $e' e^2 e^3 e^4$, upon its face, and the arm d^2 is made sufficiently resilient to allow the detent d' to ride over these lugs, which it will do by reason of the beveled face of the detent. This detent, however, will serve to prevent a return movement of the arm d^2 and of the handle A' until the wheel E is revolved.

The lugs $e' e^2 e^3 e^4$ are of different lengths, and as the wheels E and E' revolve the detent will escape past the ends of these lugs in suc-

cession, thus gradually nearing the periphery of the wheel and permitting a number of revolutions of the arbor a^3 dependent upon the position in which the handle A' was first set.

5 The circuit-controlling wheel E is provided with teeth ff , arranged in an arbitrary manner to indicate the number of the station at which the box is placed. These teeth, at each revolution of the wheel, pass beneath a lug or
10 tooth, b' , upon the spring b^2 , and thereby actuate the circuit-closing plate c in the same manner as is accomplished by the arm or rod a^1 . The teeth ff are arranged upon the periphery of that portion of the wheel E diametrically opposite the portion of the wheel E'
15 which is occupied by the lugs $e' e^2 e^3 e^4$, so that the signals occasioned by the handle A' and cam a^4 will first be sent, then subsequently the arbitrary station-signal. A wide tooth, f' ,
20 upon the wheel E stands beneath the tooth b' when the instrument is at rest, and holds the plate c against the springs c' and c^2 , thus causing the circuit to be complete.

For the purpose of actuating the wheel E,
25 the lever or handle A^2 is employed. This lever is carried upon an arbor, h , from which an arm, h' , extends at right angles. The arm h' extends between the fingers of a forked arm, h^2 , which turns upon an arbor, h^3 . When the
30 crank is drawn downward, Fig. 1, the arm h^2 is moved forward and the pawl h^4 engages a tooth of the ratchet-wheel k , which is fixed upon an arbor, h^3 . The movement of the arbor h^3 thus occasioned winds the spring k' , one
35 end of which is fast to the arbor, while the other end is fastened to a gear-wheel, k^2 , sleeved upon an arbor. The spring tends to drive the wheel k^2 , and, through a suitable train, to turn the circuit-controlling wheel E in the direction
40 indicated by the arrow.

For the purpose of preventing the device from operating until a full movement of the arm A^2 has been accomplished, the retaining-pawl h^5 of the wheel k acts to move the circuit-closing point o , the office of which will be
45 presently described, against two contact arms or springs o' and o^2 , and at the same time to hold the plate O, which carries the point o , in such position that a pin, p , projecting therefrom shall engage a block, p^2 , upon one of the
50 wheels B of the train. When the apparatus is at rest the pin p engages a lug, p' , upon this wheel, this latter lug being located nearer the periphery of the wheel than the lug p^2 . Upon
55 the first movement of the plate O, occasioned by the pressure of the pawl h^5 , the pin p releases the lug p' , but again arrests the wheel B by standing in the path of the lug p^2 before the tooth f' of the wheel E has passed from
60 beneath the tooth b' , and thus the wheel B is held until the pawl h^5 has fallen behind a tooth of the wheel k . A spring, p^3 , thereupon tends to return the plate O to its former position. This action is prevented by reason of a cam or
65 plate, p^4 , carried upon the arbor of the wheel E, a section of which is cut away for allowing a pin, p^5 , on the plate O to approach the ar-

bor when the apparatus is at rest. When, however, the plate O has been thrown back and the wheel B has completed its first move-
70 ment, the edge p^6 of the cam will have passed beneath the pin p^5 , and it will hold the plate O in its backward position until the wheel E has nearly completed its subsequent revolution. In this manner the connection between
75 the points o' and o^2 will remain complete until after the signal has been transmitted.

The springs $o' o^2$ are respectively connected with opposite terminals of the coils of an electro-magnet, R. This magnet is employed for
80 actuating a hammer, r , of a bell, r' . The object of this bell is to render it possible that signals shall be transmitted from the central station to the sub-station when the apparatus is not in use for transmitting a signal, and for
85 this reason the electro-magnet is normally in the circuit of the main line, but when the plate o is placed against the springs o' and o^2 in the manner described the magnet R is shunted, so that the impulses transmitted to line by the
90 instrument itself do not necessarily operate the bell.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a station-signaling device,
95 a want-signaling device, an independent actuating-spring for the same, and a detent restraining the want-signaling device until the station-signaling device has commenced to operate.
100

2. The combination, substantially as hereinbefore set forth, with a station-signaling device and a want-signaling device, of independent actuating devices, springs for the
105 same, and an escapement device for said want-indicating device, said escapement device being controlled by the station-indicating device.

3. The combination, substantially as hereinbefore set forth, with a circuit-closing arm, of
110 a wheel for actuating the same, means for revolving said wheel, a cam, means for revolving said cam when said wheel is operated, and a mechanical connection between said cam and said circuit-closing point, whereby the latter
115 is operated independently of said circuit-closing wheel.

4. The combination of a circuit-controlling wheel, a spring for actuating the same, an arm
120 for winding said spring, a restraining device for said wheel, a variable signal-transmitting device, a step-by-step escapement for said variable signaling device controlled by said circuit-controlling wheel, and an independent
125 arm for setting said variable signaling device.

5. The combination of a toothed rack, a pinion engaged by the same, a cam moving with
130 said pinion, a lever or arm actuated by said cam, a circuit-closing point, and a mechanical connection between said point and arm, substantially as described.

6. The combination, substantially as hereinbefore set forth, of a toothed rack, a pinion engaged by the same, a cam moving with said

pinion, a lever or flexible arm actuated by said cam, a circuit-closing point, a mechanical connection between said point and arm, a spring, an arm, a toothed wheel engaging said arm, a pawl engaged by said toothed wheel, a plate engaged by said pawl, a train of wheels actuated by said spring, normally prevented from operating by said plate, an escapement device for said rack controlled by one of the wheels of said train, and a second signal-transmitting device controlled by the movement of said train.

7. The combination, with a circuit-controlling wheel, of a spring for actuating the same, a toothed wheel, pawl, and lever for winding said spring, a retaining-pawl for said toothed wheel, and a releasing device for said circuit-controlling wheel controlled by the said retaining-pawl.

8. In a variable signal-transmitter, a revolving wheel, a lever, a pawl moved by said lever, a series of lugs upon said wheel, any one of which may be engaged by said pawl and thereby hold said lever in any of several different positions, and means for releasing said wheel, substantially as described.

9. The combination, with the circuit-controlling wheel of a signal-box, of curved lugs upon said wheel concentric therewith, the

successive lugs increasing in length gradually toward the periphery, a lever, and a pawl actuated thereby, said pawl engaging with said lugs.

10. The combination, substantially as hereinbefore set forth, of the handle A' , the rack a^2 , the yielding arm \bar{a}^2 , actuated by said handle, a pawl, \bar{a}' , the lugs $e' e^2 e^3 e^4$, the wheel E' , upon which said lugs are carried, and a spring, \bar{a}^{10} , for actuating said handle.

11. The combination, with a signal-box, of an electro-magnet normally in circuit, contact-springs connected with the respective terminals of said electro-magnet, a contact-plate applied to said springs, an arm carrying said contact-plate, means for actuating said arm when the signal-box is being set for operation and closing the circuit between said contact-springs, and a cam moving with the signaling apparatus for holding said plate against said springs until the signal has been transmitted.

In testimony whereof I have hereunto subscribed my name this 15th day of October, A. D. 1886.

AUGUST MEYER.

Witnesses:

FELIX R. SULLIVAN,
C. C. POULTNEY.