No. 827,154. PATENTED JULY 31, 1906.

P. KENNEDY.

ELECTRIC SIGNALING DEVICE.

APPLICATION FILED APR. 26, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

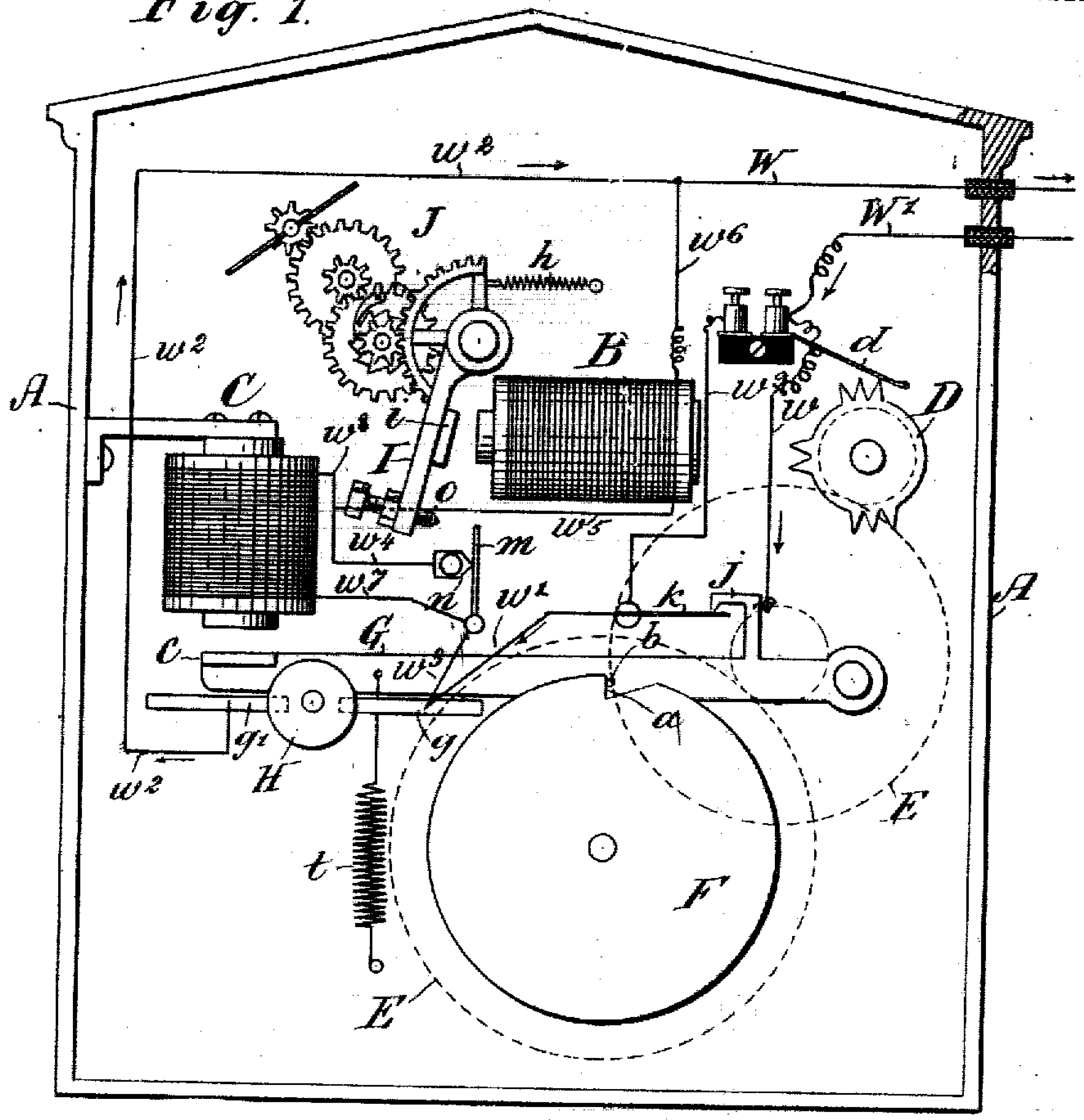
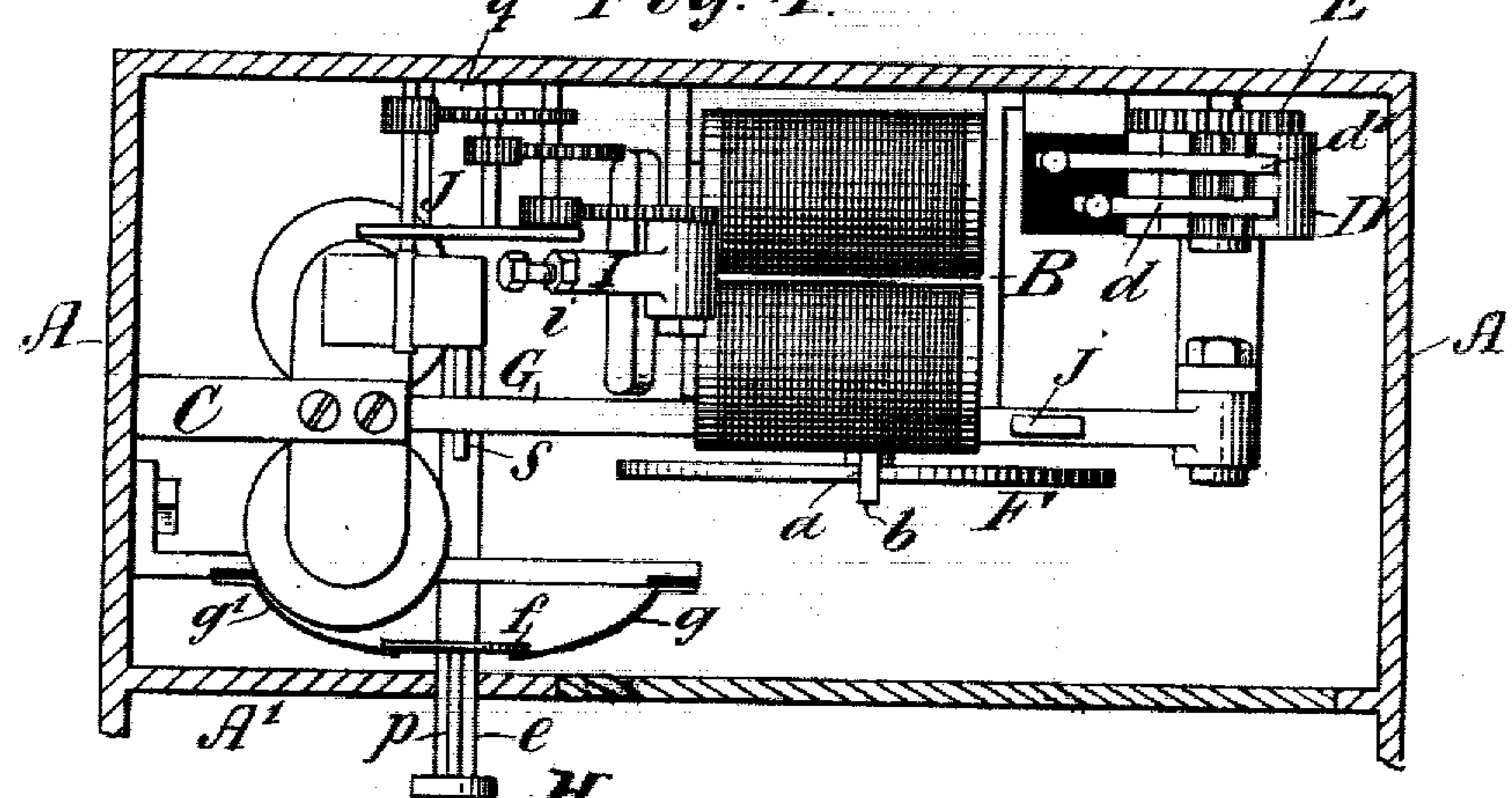


Fig. 4.



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3 SHEETS—SHEET 2

Fig. 2.

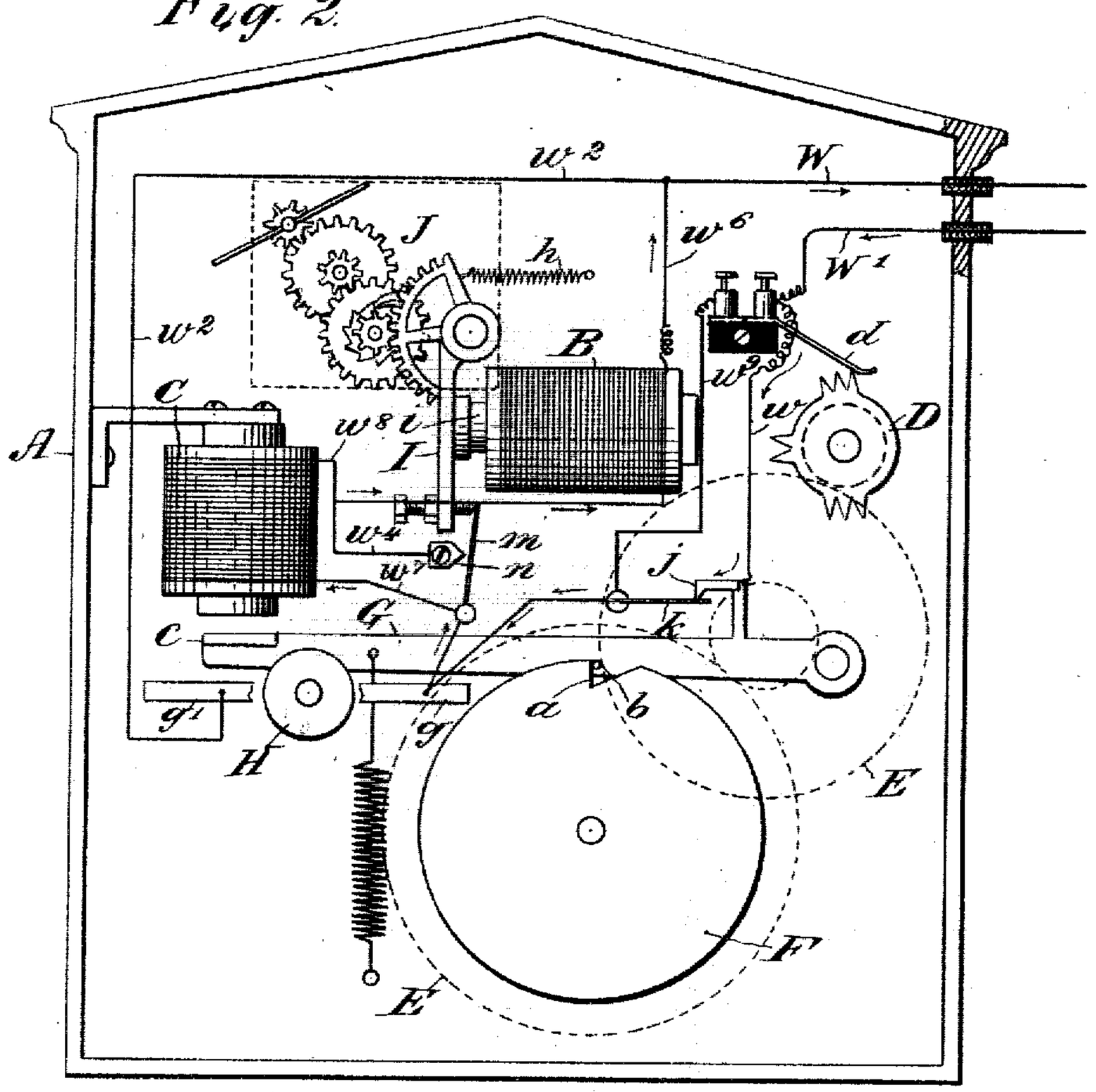
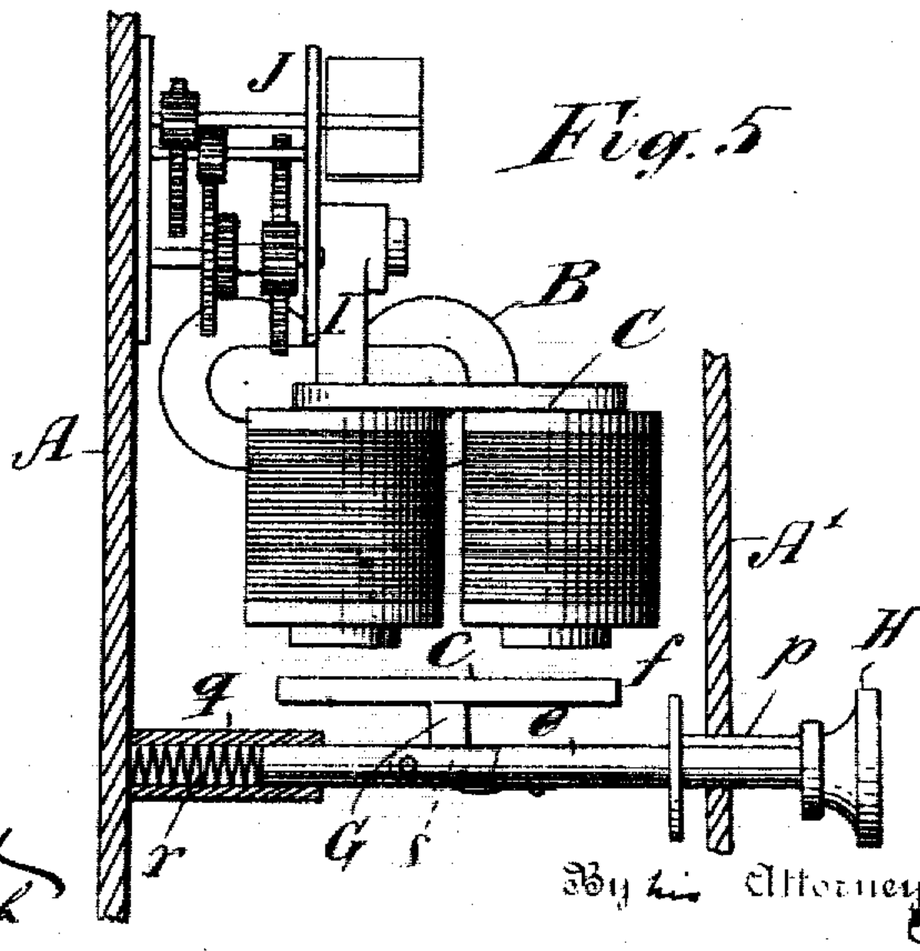


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 3.

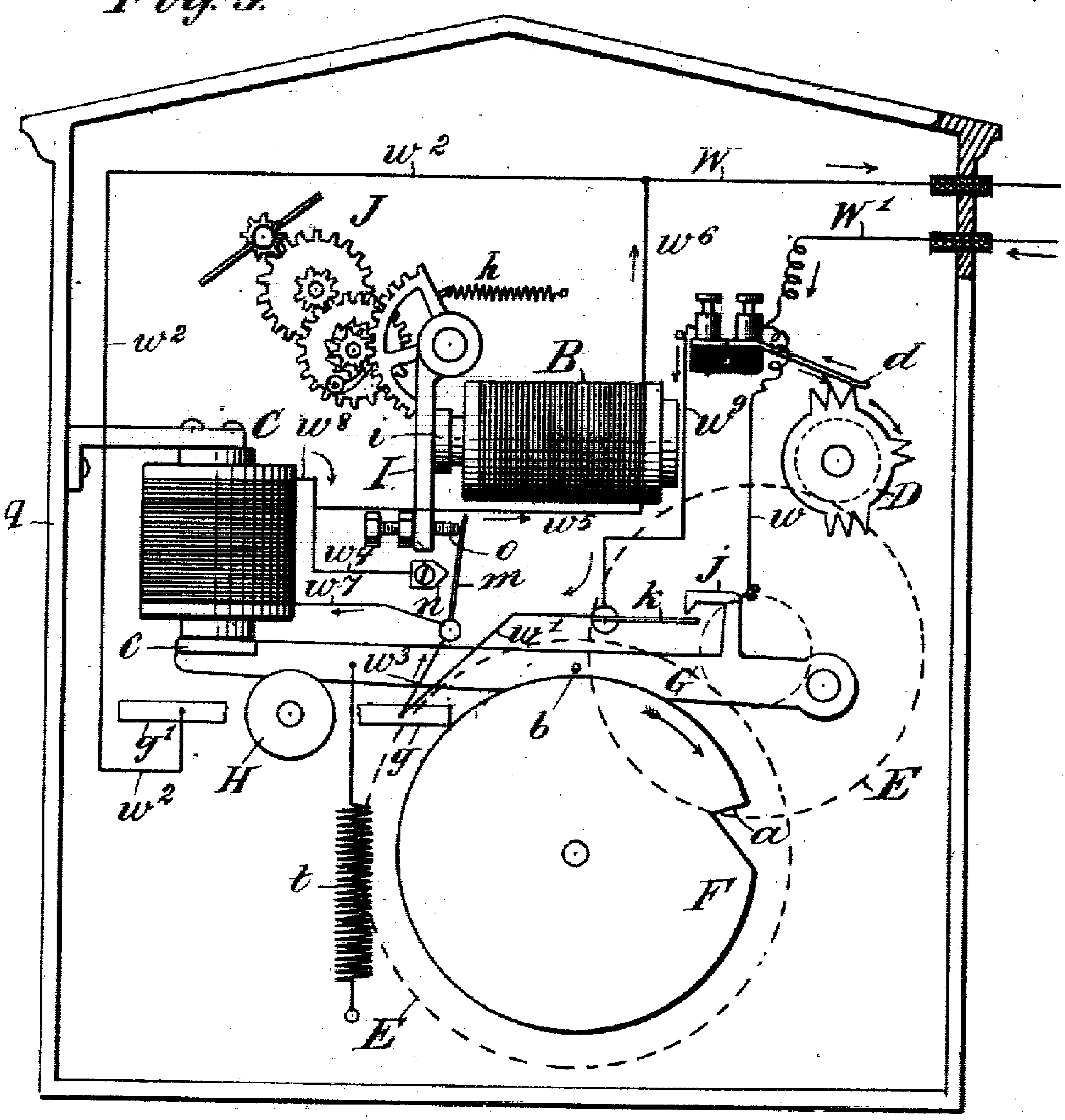
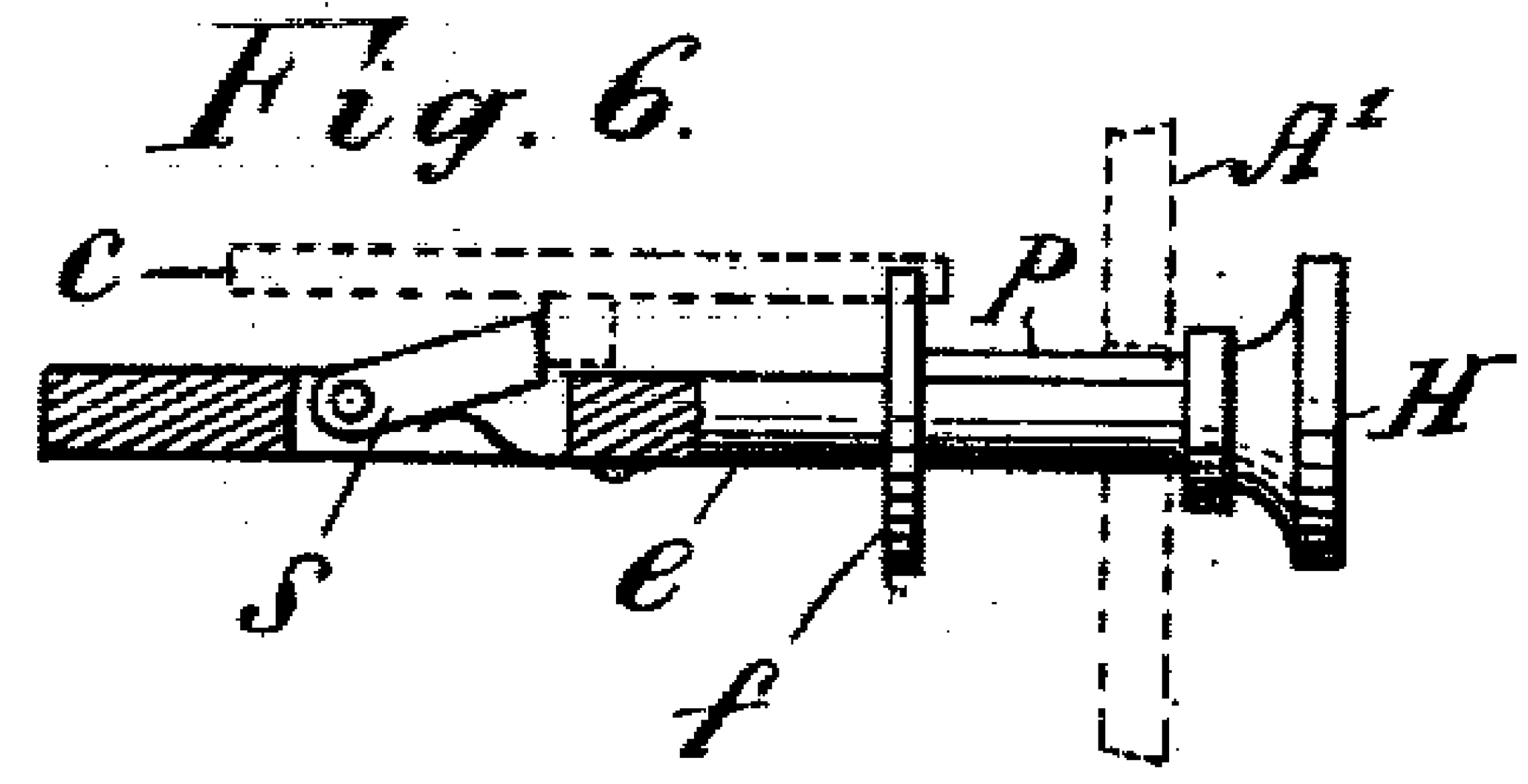


Fig. 6.



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UNITED STATES PATENT OFFICE.

PATRICK KENNEDY, OF NEW YORK, N. Y.

ELECTRIC SIGNALING DEVICE.

No. 827,154. Specification of Letters Patent. Patented July 31, 1906.

Application filed April 26, 1906. Serial No. 313,845.

To all whom it may concern:

Be it known that I, PATRICK KENNEDY, a citizen of the United States, residing in the borough of Brooklyn, in the county of Kings, in the city and State of New York, have invented certain new and useful Improvements in Electric Signaling Devices, of which the following is a specification.

This invention relates to the general class of automatic electric signaling devices of the non-interfering kind or type, of which fire-alarm signal-transmitters are examples.

The principal object of the present invention is to provide the instrument with an auxiliary electromagnet which controls the starting of the signal-transmitting mechanism, but which is normally shunted out of the line-circuit, and therefore inoperative. The main electromagnet, which is made potentially operative by the pressing in of the signal-transmitting button, serves to break said shunt about the auxiliary magnet and allow the current to flow through its coils only when the line is receptive of the signal to be sent by the instrument. The main electromagnet is also rendered normally inactive by a shunt, which is broken by the pressing in of the signal-transmitting button. The armature of the main electromagnet is provided with retarding means which renders its movements toward the poles of the electromagnet quite slow.

The invention will be hereinafter fully described with reference to the accompanying drawings, and the novel features thereof carefully defined in the claims.

In the said drawings, which illustrate an embodiment of the invention, Figure 1 is a somewhat diagrammatic view of the mechanism of the instrument when at rest. Fig. 2 is a similar view showing the position of the parts at the moment the shunt is broken by the signal-transmitting button, and Fig. 3 is a similar view showing the mechanism in operation transmitting a signal. Fig. 4 is a plan of the mechanism as seen in Fig. 1. Fig. 5 is a view of the mechanism as seen from the left in Fig. 1, some of the parts being in section. Fig. 6 is a detached detail view of the signal-transmitting button.

In the principal views, A designates a box inclosing the mechanism of the signal-transmitting instrument.

B is the main electromagnet.

C is the auxiliary electromagnet.

D is the break-contact wheel, driven by an ordinary clock mechanism or train E. (Only shown herein diagrammatically, as this is a common feature in the present art.) Driven by the train is a disk F, which has in its edge a notch forming a shoulder *a* to be engaged by a stud or pin *b* on a detent-lever G, so as to hold the driving mechanism against movement. The disk E rotates when free in the direction indicated by the arrow thereon. On the detent-lever G is the armature *c* of the auxiliary magnet C, and when this magnet is excited it lifts said lever until the pin *b* is free from the shoulder *a*, and thus permits the train to drive the break-contact wheel D. The brushes *d d'* of the break-contact wheel rest normally on a tooth of said wheel, thus establishing electric connection between them.

H is the signal-transmitting button. This button does not act directly to transmit a signal, but is in the nature of a circuit-breaker, which when pressed in breaks a shunt about the main magnet, and thus puts the instrument in potential condition to transmit the signal when the line becomes receptive. It will be sufficient at this point to state that the stem *e* of the button H carries a contact-piece *f*, Fig. 4, which under normal conditions connects electrically two terminal contacts *g* and *g'* at a break in the shunt-circuit.

I is the armature-lever of the main magnet B. *h* is its spring.

i is the armature, and J is an ordinary retarding device for the armature.

The line-wires entering the box A are designated by W and W'. The current entering by the wire W' under normal conditions when no signal is being sent goes to the binding-post of the brush *d* of the wheel D, thence by wire *w* to a contact *j* on the detent-lever G, thence to a spring-contact *k*, thence by wire *w'* to the terminal *g* at the button, thence to the terminal *g'* thereat, and thence by wire w^3 to the line-wire W. This forms a shunt about the main magnet B. If this shunt be broken by the pushing in of the button H the current may flow from wire W' by wire *w*, contacts *j* and *k*, and wire *w'* to contact *g*, thence by wire w^3 to a spring-contact *m*, thence to a contact *n*, thence by wires w^4 and w^5 to the coils of magnet B, thence through said coils, and thence by wire w^6 to the line-wire W. If the current be flowing, this will excite the magnet B and it will attract its armature *i*, and if the line is recep-

tive the armature will continue to move up to the poles of the magnet. In the meantime the auxiliary magnet C is shunted out of the line-circuit; but means are provided whereby the armature-lever I in its movement toward the poles of the magnet B will at some predetermined point in its travel break the shunt about the magnet C and allow the current to flow through its coils and excite it. This feature will now be described. At its free end the armature-lever I carries a screw or adjustable pin *o*, which will in the movement of said lever toward the poles of the magnet B impinge upon the spring contact-terminal *m* and move it out of contact with the fixed contact-terminal *n*, thus breaking the shunt about the magnet C. This is the momentary position of the parts seen in Fig. 2. The current now flows from the terminal *g* to the contact-terminal *m*, thence by a wire w^7 to the coils of the magnet C, through said coils, thence by a wire w^8 to wire w^5, and thence through the coils of magnet B and wire w^6 to the line-wire W. The auxiliary magnet C will now be excited and will attract its armature *c*, thus lifting the detent-lever G and moving the stud or pin *b* out of engagement with the shoulder *a* on the disk F and setting the train in motion. This is the position of the parts seen in Fig. 3; but the instant the detent-lever C is lifted ever so little the circuit will be broken between the contact-terminals *j* and *k* and the current must flow through brush *d* to the tooth of wheel D, thence through brush *d'* to its binding-post, and thence by a wire w^9 to the wire *w'*. The wheel D now becomes a circuit-breaker, and the current through magnet B will be momentarily broken whenever the brushes pass off from a tooth of said wheel.

The general features being now understood, the means for breaking the shunt-circuit at the button H and maintaining said break until the signal shall have been transmitted may now be explained, premising, however, that other equivalent devices may as well be employed. The stem *e* of the button H has a spline *p*, engaging a suitable groove in the plate or partition A' in the box A, through which it plays, said spline preventing axial rotation of the stem. At its inner end the stem plays in a spring-case and guide *q*, Fig. 5, against a spring *r*, which tends to press the button outward. In the stem is mounted a spring latch-detent *s*, Figs. 5 and 6, which is kept pressed into its slot normally by the detent-lever G. When the button is pressed in, this latch passes the lever G and files out or up and by taking behind the lever G prevents the spring *r* from pressing the button outward until the lever G is lifted far enough to set the signal-transmitting mechanism in motion. This detent serves to maintain the break in the shunt about the magnet B until the mechanism is set in motion. When the button is freed and moves outward, it closes the shunt about the magnet B, and the latter is shunted out from the line-circuit. Its armature and lever move back and the contact-terminals *m* and *n* come together and shunt out the auxiliary magnet C. The detent-lever G is now free to be drawn down by its spring *t* or gravity, as preferred, and the pin or stud *b* falls on the rim or periphery of the disk F, on which it rides until the latter shall have made a complete revolution, when the said pin will drop down in front of the shoulder *a* on the disk and arrest the movement of the driving mechanism. When the pin *b* drops low enough to engage the shoulder *a*, the contacts *j* and *k* will be brought together and the brushes *d* and *d'* thus shunted out from the line-circuit.

The practical operation of the instrument when the line is clear and receptive of the signal has been sufficiently described above; but if the conditions are different and a signal is being sent from some other transmitting instrument in the same closed circuit the operation will be as follows: The person wishing to send the signal opens the door of the box and presses in the button H, which will be retained by the means already described. The shunt about the magnet B will thus be broken; but as a signal is being sent by another instrument in the circuit the armature of the magnet B will only be moved to a slight extent by the momentary excitation of said magnet and not to an extent sufficient to permit the screw *o* to impinge upon the contact-terminal *m* and break the shunt about the auxiliary magnet C. The retardation of the armature *i* will suffice to allow any signal to be sent from another transmitting instrument in the circuit before the armature can reach the position seen in Fig. 2, and thus cause the break in the shunt about the auxiliary magnet C. Nevertheless the mechanism will remain in position, whereby when the signal at the other instrument shall have been sent and the circuit closed the signal will be automatically sent without the necessity of any further manipulation. The transmitting instruments may operate in succession in case several signals are to be sent at the same time—that is to say, if, for example, the buttons of several instruments shall be pressed substantially simultaneously they will send their signals automatically in a prearranged succession, and this succession may be effected by adjustment of the screws *o* of the several instruments, so that the said screws will break the shunts about the respective auxiliary magnets at different points in the movement of the armature *i* toward the poles of the magnet.

It will be noted that, as herein shown, the instruments operate on a closed circuit and that there are three shunts—namely, one

about the break-contact device, one about the main magnet B, and one about the auxiliary magnet C; also, that the button H breaks the shunt about the magnet B, that the magnet B breaks the shunt about the magnet C, and that the magnet C breaks the shunt about the break-contact device. Obviously any equivalent circuit-breaking means may be employed in lieu of the button shown. It will also be noted that the magnet C when excited acts to reëstablish the shunts about itself and the magnet B, not the shunt about the break-contact device.

In Figs. 2 and 3 the terminals g and g' are shown as partly broken away. This is done merely to illustrate the condition, the shunt about the magnet B being broken in both of these views by the pushing in of the button H.

Having thus described my invention, I claim—

1. An electric signaling instrument, having mechanism for transmitting a signal, an auxiliary electromagnet which sets said mechanism in operation, a shunt about said auxiliary magnet which shunts it normally out of the line-circuit, a main electromagnet, circuit-breaking means operated by said magnet for breaking the shunt about the auxiliary magnet, a shunt about said main magnet which shunts it normally out of the line-circuit, manually-operatable means for breaking the shunt about the main magnet when a signal is to be sent, and means for holding the last-named shunt open until the transmitting mechanism is set in operation.

2. An electric signaling instrument, having mechanism for transmitting a signal, which mechanism includes a break-contact device normally in shunt, an auxiliary electromagnet which sets said mechanism in operation and simultaneously breaks the shunt about the break-contact device, a shunt about said auxiliary magnet which shunts it normally out of the line-circuit, a main electromagnet, circuit-breaking means operated by said main magnet for breaking the shunt about the auxiliary magnet, a shunt about said main magnet which shunts it normally out of the line-circuit, manually-operatable means for breaking the shunt about the main magnet when a signal is to be sent, and means for holding the last-named shunt open until the transmitting mechanism is set in operation.

3. An electric signaling instrument, having mechanism for transmitting a signal, said mechanism including a break-contact device normally in shunt in the line-circuit, a detent-lever which arrests the operation of said mechanism, an auxiliary electromagnet in shunt in the line-circuit, the armature of said magnet, carried by the detent-lever, means carried by the detent-lever for breaking the shunt about the break-contact device when the mechanism is set in motion, a main magnet in shunt in the line-circuit, means actuated by the main magnet for breaking the shunt about the auxiliary magnet when the armature of the main magnet reaches a predetermined point in its travel, manually-operatable means for breaking the shunt about the main magnet when a signal is to be sent, means for holding said shunt open until the transmitting mechanism is set in motion, and means for automatically closing the magnet-shunts when said mechanism is set in operation.

In witness whereof I have hereunto signed my name this 25th day of April, 1906, in the presence of two subscribing witnesses.

PATRICK KENNEDY.

Witnesses:
H. G. Hose,
William J. Firth.