

(No Model.)

2 Sheets—Sheet 1.

H. C. THOMSON & G. J. GALBRAITH.

AUTOMATIC SET BACK ANNUNCIATOR.

No. 529,144.

Patented Nov. 13, 1894.

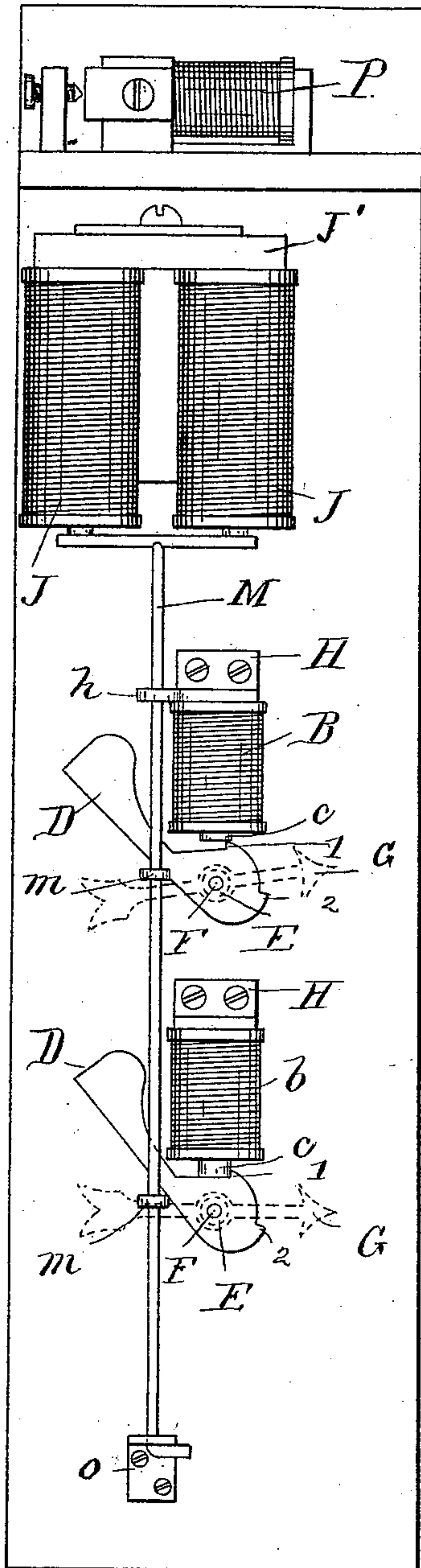


Fig. 1.

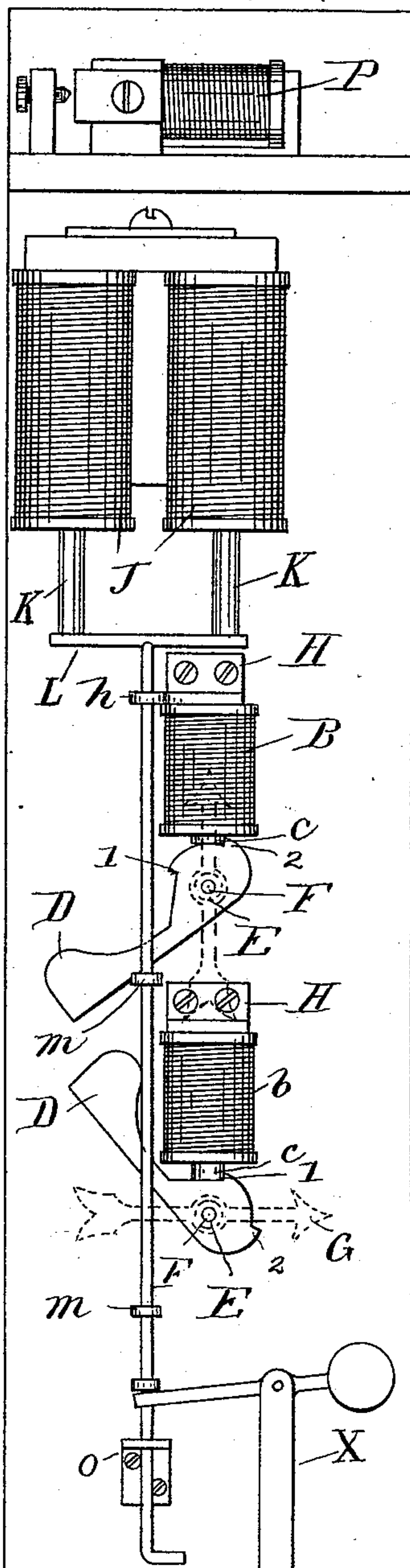


Fig. 2.

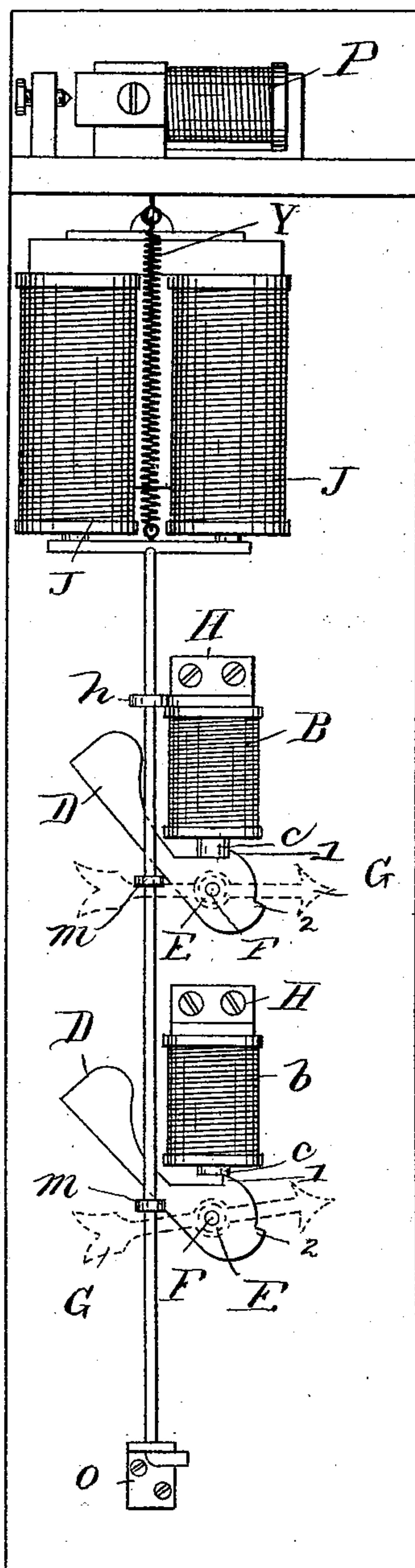


Fig. 3.

WITNESSES.

Stephen A. Foster.
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INVENTORS.

Henry C. Thomson
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(No Model.)

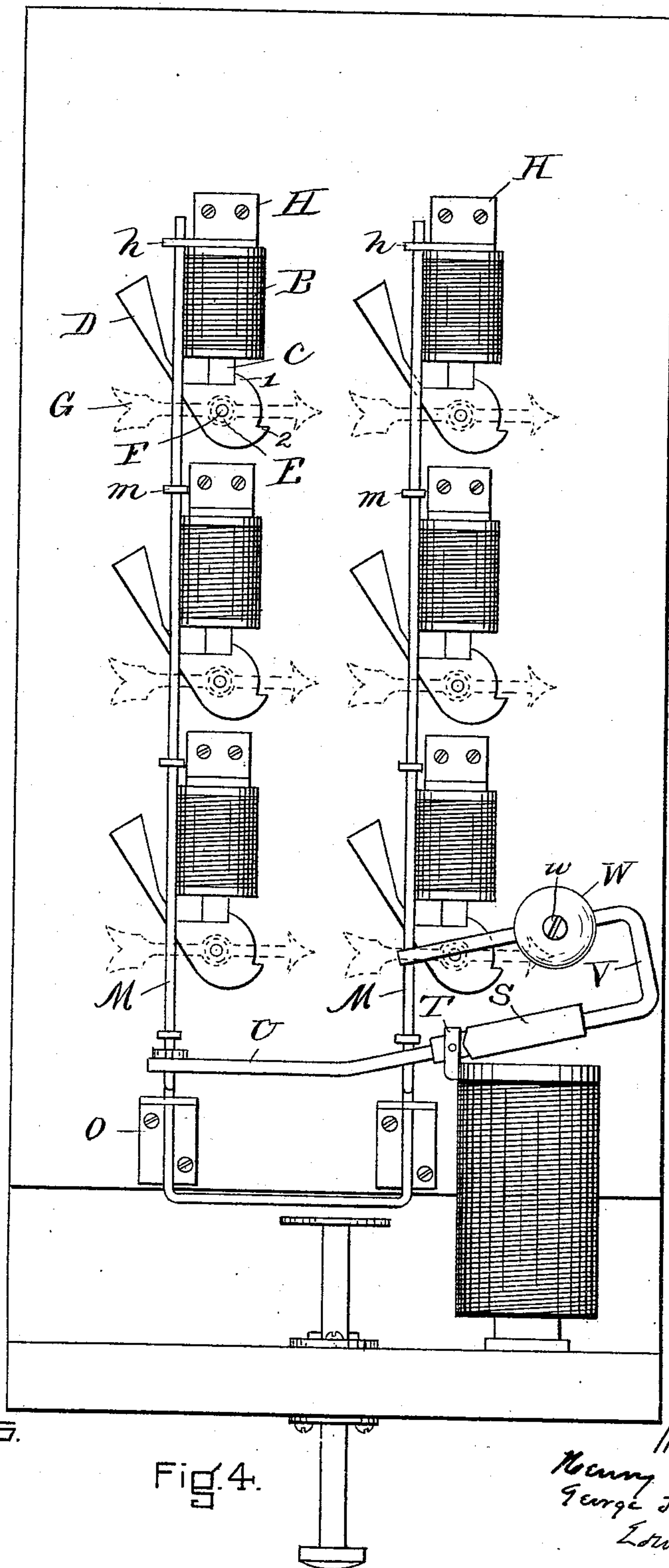
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Fig.4.

INVENTORS

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UNITED STATES PATENT OFFICE.

HENRY C. THOMSON AND GEORGE J. GALBRAITH, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO THE ELECTRIC GAS LIGHTING COMPANY, OF MAINE.

AUTOMATIC SET-BACK ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 529,144, dated November 13, 1894.

Application filed July 2, 1894. Serial No. 516,272. (No model.)

To all whom it may concern:

Be it known that we, HENRY C. THOMSON and GEORGE J. GALBRAITH, citizens of the United States, residing at Boston, Massachusetts, have invented a new and useful Improvement in Automatic Electric Set-Back Annunciators, of which the following is a specification.

Our invention relates to annunciators in which any index-finger, after indicating any desired point or figure, is automatically returned to position by a lift operated by electricity instead of by hand. Where a lift is not used, triggering devices have been used to control the index-fingers, and operated by a separate magnet whose armature is properly combined with said triggering devices. Our invention has to do with such combination of the mechanism operating the index-fingers with lifting mechanism for returning the index-fingers to position, as avoids manually operating the lifting rod, and also avoids a second push upon an electric button, as is needed with a non-automatic electric set-back.

Our invention consists in effecting a serviceable combination between an electro-magnet, or series of electro-magnets for controlling one, or more index-fingers, and a lifting device operated by an electro-magnet arranged to be energized by means of the same current which operates the index-magnets.

In order to make clear our invention, we will call attention to United States Letters Patent No. 486,820, of November 22, 1892, to F. S. Carter, as illustrating an automatic annunciator in which a series of magnets are used to operate a series of index-fingers, while a second magnet operates an armature controlling trigs which hold said index-fingers. Whenever a succeeding index-finger is moved, this armature releases the trig and the index-finger falls back to normal position by gravity. Our improvement differs in construction, and in returning the index-fingers, not by gravity but by an electrically operated lifting device.

In Letters Patent to Axthelm and Pease, No. 177,918, is shown an electric lifting device; but widely differing from our invention.

Although no particular form of the annunciator-part is essential, yet in the drawings we

have shown a form like that shown in Letters Patent to Ross, No. 513,956, January 30, 1894, and No. 521,046, of June 5, 1894, which in general may be described as composed of several single helices whose sliding armature-cores serve as detents to normally retain weighted levers, swinging upon the ends of spindles whose other ends carry the index-fingers, until any one of said helices is energized, when its armature is drawn up into the coil, releasing its weighted lever which falls and rotates the index-finger. In this Ross apparatus the index-fingers are manually restored by a lift.

The idea of our invention consists in combining with these, or similar electric annunciators, a lifting electro-magnet, in circuit with each of the index-magnets; and in so combining the several parts as that the lift shall not itself carry any weighted lever high enough to be caught by the falling armature-core of the index-magnets; but so that the momentum imparted by said lift to any released index-lever will throw it so high that its ratchet will be caught by said armature-core of the index-magnet. The current from the battery always passes through this second lifting magnet.

In the accompanying drawings, which do not show the front of the plate upon which the index-fingers appear, Figure 1. is a plan view when the magnet is energized. Fig. 2. is a plan view after the lifting magnet, as well as one of the index-finger magnets, have been energized and then de-energized. Fig. 3. is like Fig. 1. showing also a spring J to balance the weight of the lifting-rod. Fig. 4. is a front view in which, instead of the solenoid lifting magnet, an ordinary electromagnet with a different lever arrangement for gearing with the lifting rod is used as a lifting magnet.

Our invention will be clearly understood from the accompanying drawings, in which—

A is the rear of the annunciator face-plate.

B, b and b' are the coils or index-magnets, each having the falling or sliding core C, and each having also the weighted lever D with ratchets 1, 2, supported in the sleeve E upon the spindle F, upon whose other end is fixed the index-finger G. These index-magnets may be fastened to the face-plate by the standard

H, and the most elevated of the lot may have an ear *h* in which may run the lifting-rod.

J J are the helices of a double electro-magnet or coil fastened upon the support J', and having the sliding armatures K K. These are, by the cross-piece L, connected at about the center with the lifting rod M, which at its lower extremity slides in the standard O, being bent into proper form for that purpose.

Upon the lifting-rod M are the spurs or catches *m m*, properly spaced with reference to each other and to the magnets.

P is the ordinary bell mechanism, through the magnet of which the current may pass in order to operate a gong. In case many drops are to be used, a difficulty may be found in the comparative strength of the solenoid (owing to the small battery power usual in these devices) with the weight of the lifting device, and we have shown at X and Y a spring and a weight either of which may be used in such cases to counterbalance the weight of the lifting device as will be plain from the drawings.

The operation of this apparatus is as follows:—Upon the current being admitted to Fig. 1 by means of the ordinary press-button connecting the circuit with an electric battery, the magnet P will be energized, causing the bell to ring, and the current will also energize the double helix J, J, which will thereupon attract its armature-cores, elevating the lift. Simultaneously the current will pass, for instance, through the index-magnet B, causing it to attract its armature-core C out of the ratchet *l*, upon the weighted lever D. Upon the interruption of the current and the de-energizing of these magnets, the lift will fall abruptly as will also the weighted lever D, causing its corresponding index-finger to turn and point at the place desired, as in Fig. 2. The catch *m* upon the lifting rod does not by itself carry the lever D high enough to gear with the core, but only by the momentum which it imparts to the lever D. Hence if the core be elevated, the lever D will be disengaged from the core. It will always be disengaged whenever the core is drawn within the magnet. Upon this same operation being repeated with another button, admitting the current to another index-magnet *b*, and to the helices J, J, the spur *m*, on the lift being suddenly raised, will throw the weighted lever D of the index-magnet B, so high that the armature-core of said magnet will catch in its ratchet and retain the weighted lever; whereby said armature and the lever and index-arm of B are automatically restored to a position for use, while the lever and index-finger of magnet *b* will fall when the lift falls; as will be plain from Fig. 3.

In Fig. 4 we have shown an alternative arrangement of a double magnet lettered R, having its armature S, pivoted upon the ears T, and having the projecting lifting lever U, arranged to gear with the double lifting rod M. In the front of the armature is inserted

a wire V, bent back over the armature and carrying a sliding ball weight W, with an adjusting screw *w*. The rest of the apparatus is the same. By means of the adjustably weighted armature, the weight of the lifting rod can be nearly, but not quite, counterbalanced; and in an annunciator in which there are many drops, it may be preferred to use this magnet rather than the solenoid; although, as already pointed out, the action of the solenoid may be reinforced by a spring or a weight to counterbalance the weight of the lift.

We have successfully used both electric set-back devices, viz: either the double solenoid, or the double magnet, and we express no preference as between the two to operate a few pointers; but for operating many pointers the last form may be preferable.

It will be seen that by means of this invention, we avoid the necessity of restoring by manual means the index-finger and its weighted lever after every operation of the same; this being accomplished automatically at the subsequent energizing of some one of the other index-magnets. Thus, the apparatus may be spoken of as automatic or self-restoring, containing an "automatic set-back;" because it accomplishes not only the work of an annunciator as such, but also the work of the attendant whose offices are usually necessary to keep the apparatus in working condition, either by manually moving the lift or by pressing an electric button to admit a current to a magnet to operate the lift.

Having described our invention, what we claim is—

1. An electric set-back annunciator composed of one or more magnets having each a sliding armature-core normally retained beyond said helix, an unequally balanced tripping lever, one of its ends having a ratchet, an index-spindle properly supported upon the faceplate one end carrying said lever, an index-finger upon the opposite end of said index-spindle, a sleeve or support therefor, a lifting rod provided with catches adapted to gear with said tripping lever, a lifting electromagnet in circuit with the aforesaid magnet or magnets, and an armature therefor having a lever connection with said lifting rod, substantially as described and shown.

2. In combination with an annunciator composed of one or more magnets, each having a sliding armature-core adapted to act as a detent, a weighted lever adapted to gear with said detent, a sleeved spindle carrying said lever, and an index-finger upon the opposite end of said spindle, a lifting-rod having catches adapted to elevate said weighted lever and an electromagnet, in circuit with the aforesaid magnets, an armature therefor, a lever operated by said armature and operating said lifting rod, substantially as described and shown.

3. In an electric annunciator the combination of one or more magnets B, having each

a sliding core *c*, a weighted lever *D* having the ratchets 1, 2, a spindle *F*, a sleeve *E* supporting the spindle, an index-finger *G* upon the opposite end of said spindle, a lifting rod *M* having the catches *m*, a lifting eletromagnet in circuit with the aforesaid magnets and an armature therefor provided with a lever-extension connecting with said lifting rod *M*, all substantially as described.

4. An electric set-back annnnciator, composed of pointer-magnet *B*, standard *H*, sliding core *c*, weighted lever *D*, spindle *F*, sleeve *E*, index-finger *G*, lift *M* having catches *m*, an electromagnet with its armature *S*, pivoted upon the ears *T* and the armature-lever *U*, arranged to operate the lifting rod *M*, all substantially as described.

5. In an electric set-back annunciator, the combination of magnet *B*, standard *H*, sliding core *c*, weighted lever *D*, spindle *F*, sleeve 20 *E*, index-finger *G*, lift *M*, having catches *m*, an electromagnet with its armature *S* pivoted upon the ears *T*, armature-lever *U*, arranged to operate the lifting rod *M*, and the wire *V*, with the sliding weight *W* and adjusting 25 screw *w*, substantially as described.

In witness whereof we hereunto subscribe our names this 13th day of April, 1894.

HENRY C. THOMSON,
GEO. J. GALBRAITH.

In presence of—
STEPHEN A. FOSTER,
EDW. P. PAYSON.