

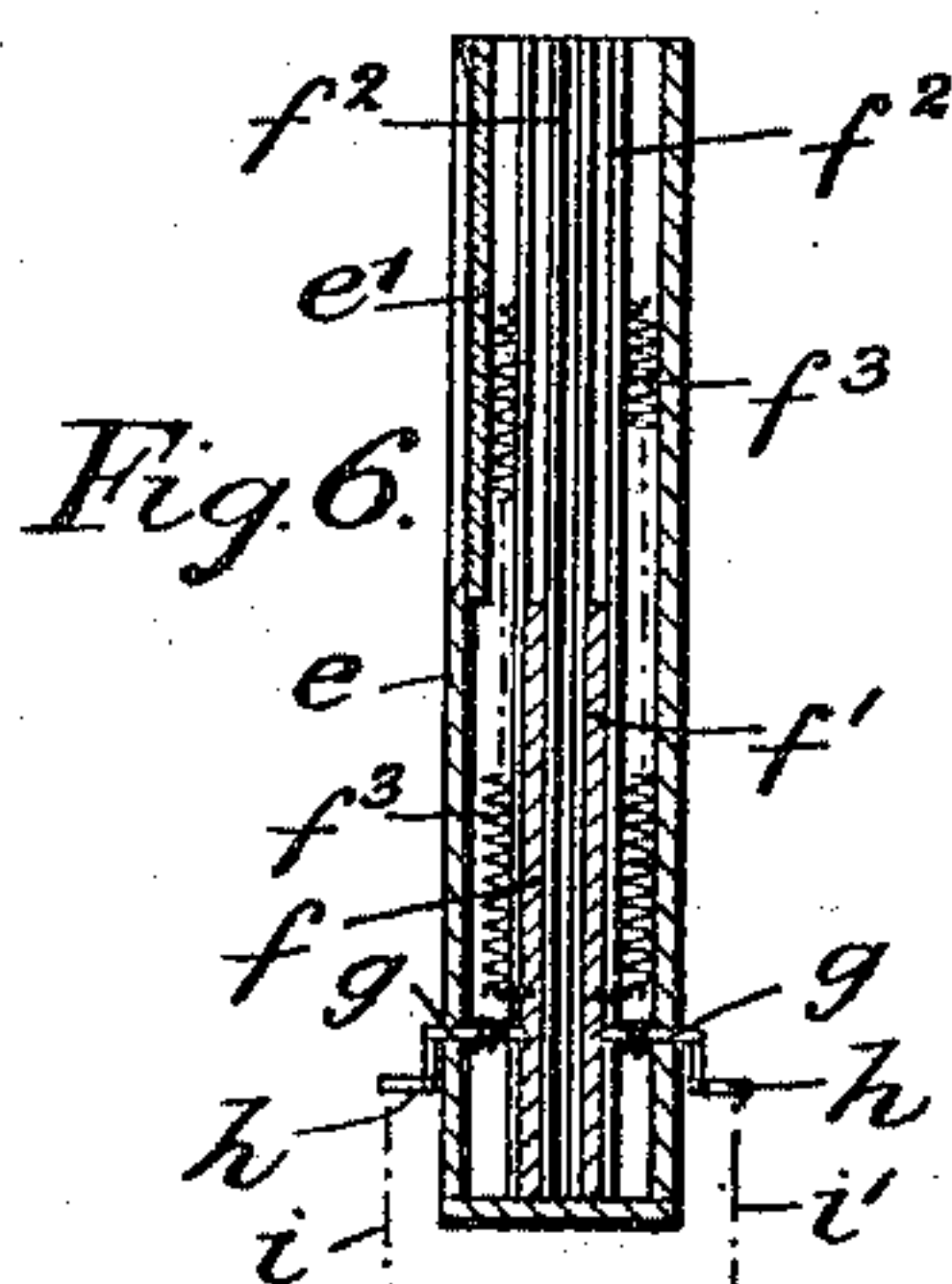
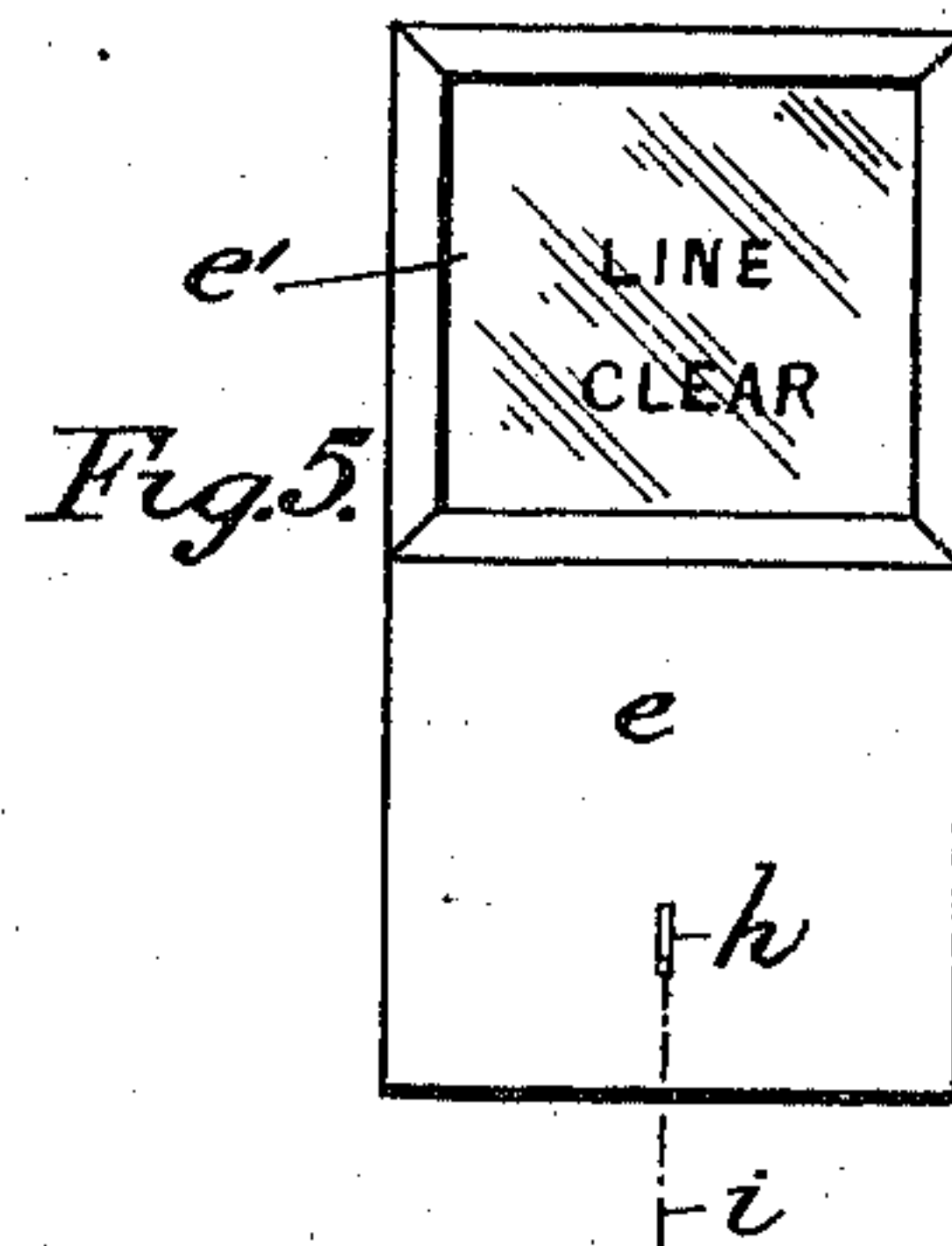
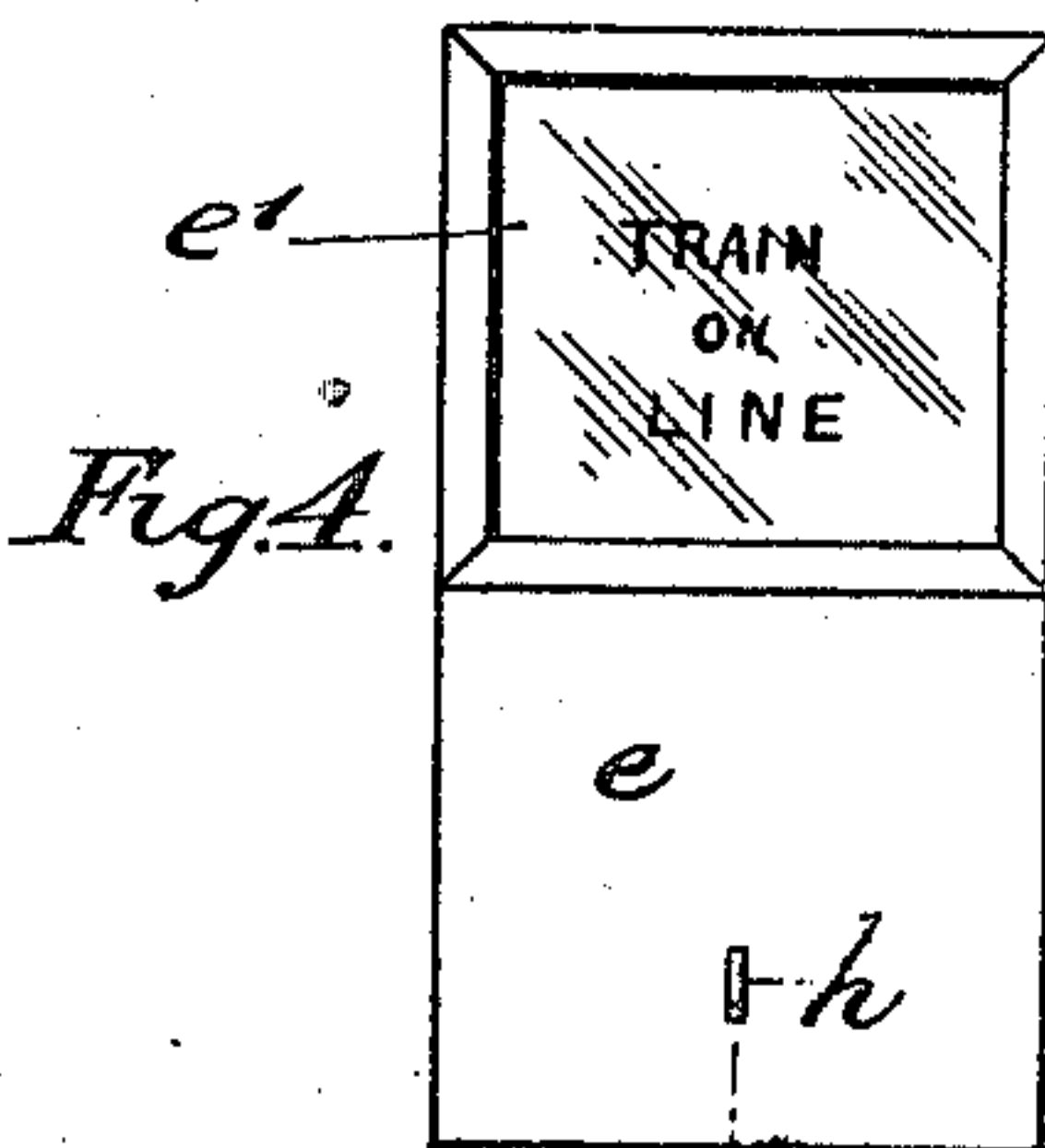
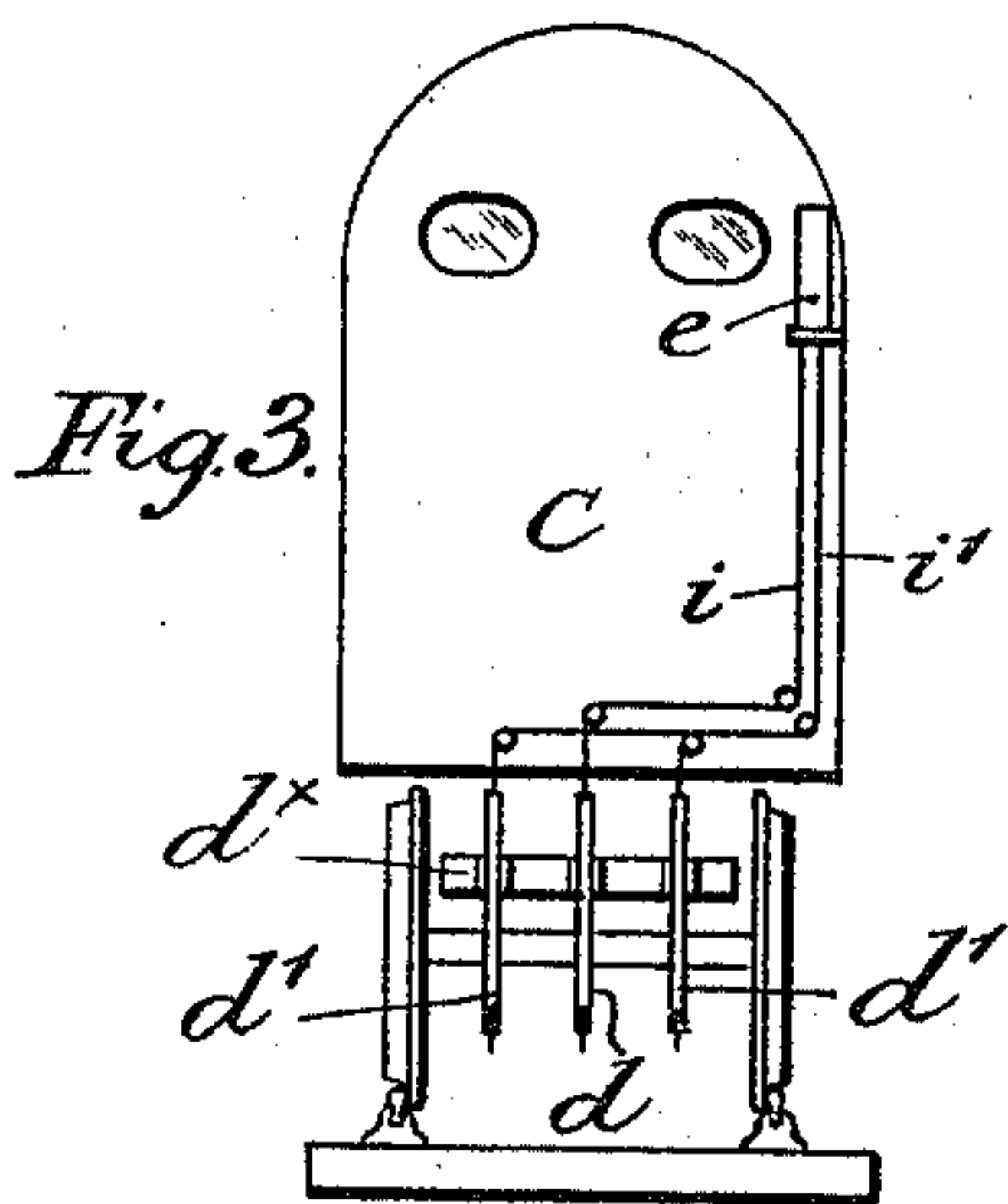
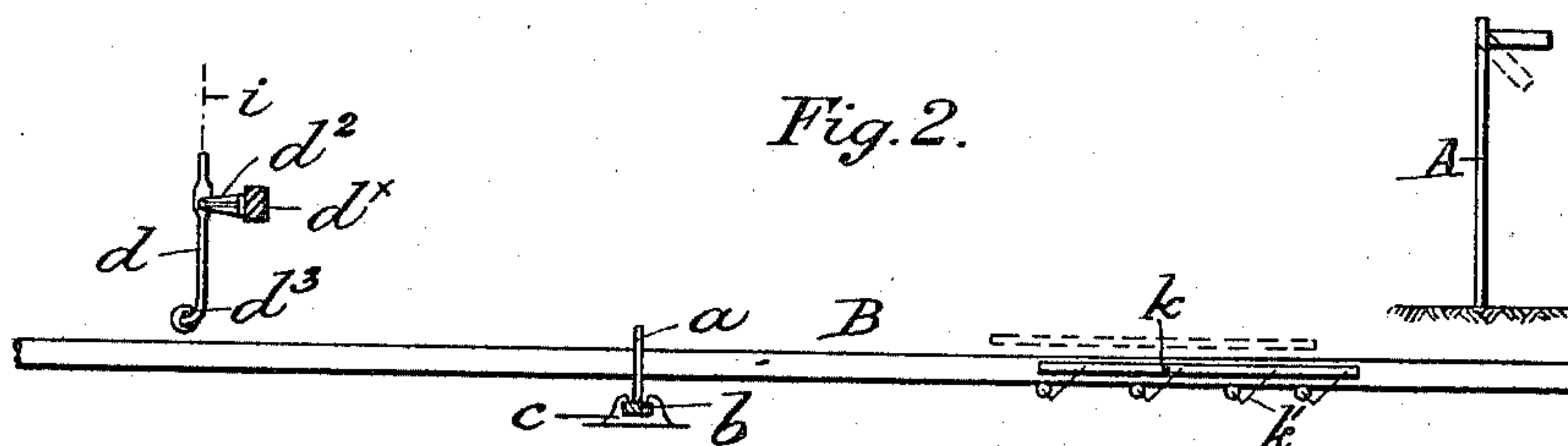
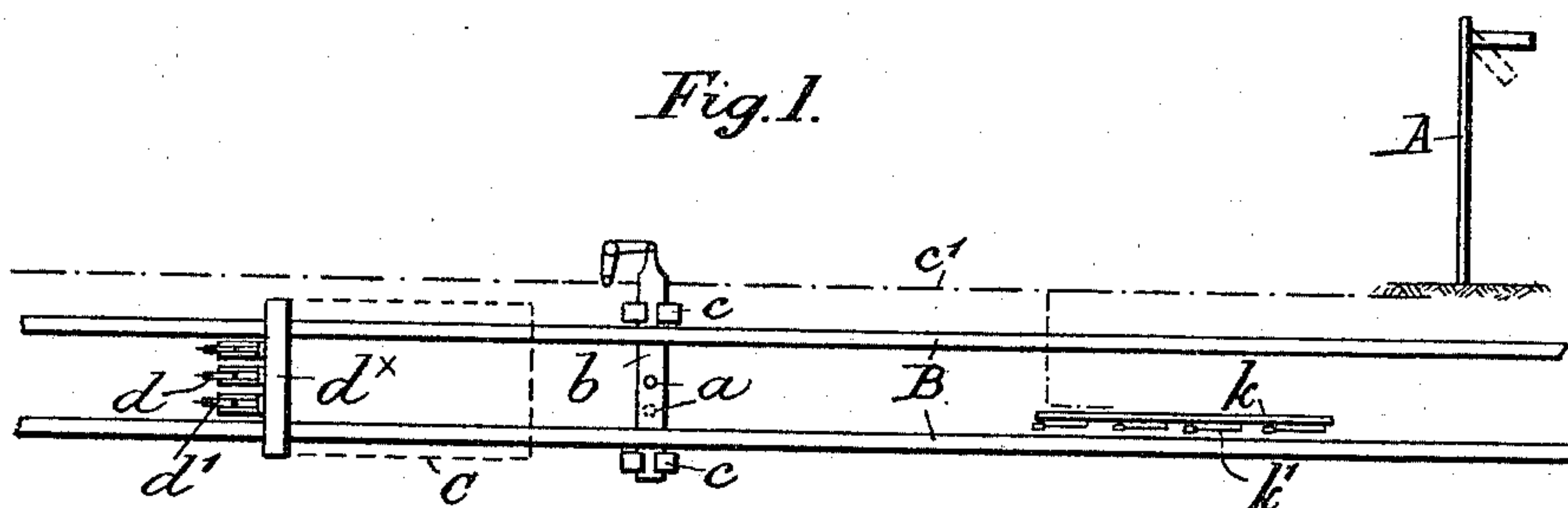
(No Model.)

2 Sheets—Sheet 1.

G. V. ALLEN.
APPARATUS FOR SIGNALING ON RAILROADS.

No. 585,999.

Patented July 6, 1897.



Witnesses;

J. B. Keefe
Geo. H. Rea

Inventor;
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Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2^a

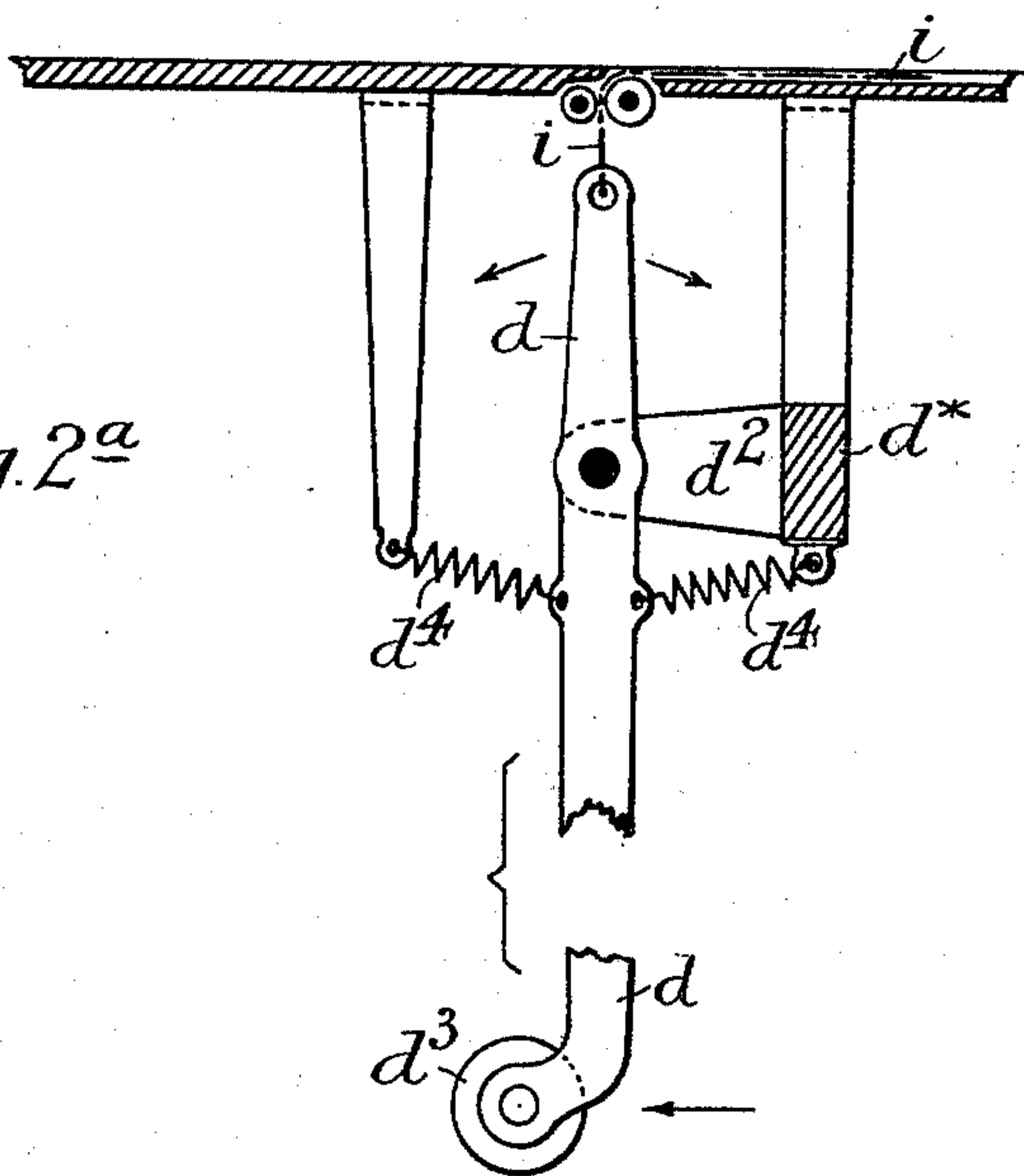
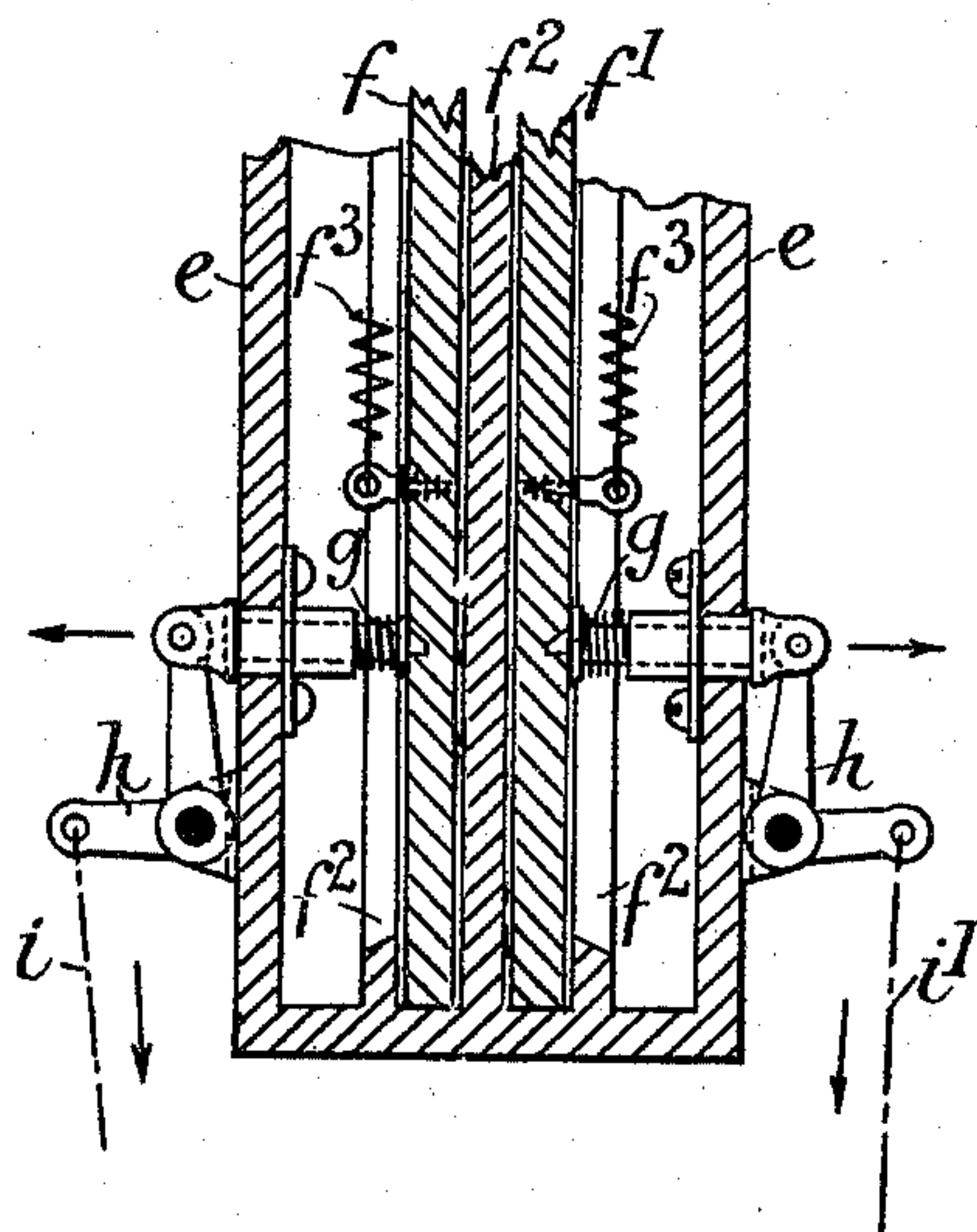


Fig. 6^a



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE V. ALLEN, OF LONDON, ENGLAND.

APPARATUS FOR SIGNALING ON RAILROADS.

SPECIFICATION forming part of Letters Patent No. 585,999, dated July 6, 1897.

Application filed December 7, 1896. Serial No. 614,857. (No model.)

To all whom it may concern:

Be it known that I, GEORGE VERNON ALLEN, a subject of the Queen of Great Britain and Ireland, residing at London, England, have invented certain new and useful Improvements in Apparatus for Signaling on Railways, of which the following is a specification.

This invention relates to improvements in apparatus for signaling on railways, and is designed to provide means whereby the driver of an engine may be directly notified by signal apparatus upon the engine itself as to what is the state of the main signal controlling the section of line he is approaching, even although such signal be hidden from sight from any cause, such as foggy weather.

According to my said invention I provide in advance of the main-signal post a movable stop adapted to engage and operate one or other of a set of depending arms on the engine, so arranged that when either of them is operated it causes a plate corresponding to the position of the signal to be displayed in view of the driver. This plate remains in view until it is put back into its normal position by the driver, ready to receive another signal. The said arms may also be caused to operate a bell, whistle, or other audible signal to call the driver's attention to the fact that one of the signal-plates has been actuated.

The invention will be readily understood by reference to the accompanying drawings, in which—

Figures 1 and 2 are respectively a plan and side view of a portion of a railway-line, illustrating diagrammatically the working of my improvements. Fig. 3 is also a diagrammatic view of the arrangement of the depending arms and signal apparatus on the engine. Figs. 4 and 5 are front views of the said signal apparatus, showing the manner in which the signals are displayed; and Fig. 6 is a vertical transverse central section of Fig. 4, showing the internal construction. Figs. 2^a and 6^a are partial detail views of Figs. 2 and 6, respectively, drawn on an enlarged scale.

A represents the main signal, B the rails, and C the engine approaching the signal.

a is the movable stop, which consists of a vertical rod secured upon a sliding bar or

plate *b*, working transversely of the rails B in suitable guides *c*, and connected with and actuated by the wires *c'* for working the main signal. The arrangement is such, for example, that when the latter is at "danger" the movable stop will be brought into the center of the track, while when it is at "line clear" the said stop will be moved to one side.

d d' are the downwardly-depending arms upon the engine, of which there are advantageously three working in both directions, the center one *d* giving the "danger" signal, while each of the outer pair *d'* is arranged to actuate the "line-clear" signal, thus providing for the engine traveling either in the ordinary manner or tender first. The arms are each pivoted in brackets *d*², carried by a cross-bar *d*^x on the engine, and at their lower ends they are provided with rollers *d*³, which may be rubber-tired to prevent friction and to avoid undue shock or jar against the stop *a*.

*d*⁴ are springs connected to any convenient part of the engine-framing, by which the arms are kept normally in a practically vertical position. The arms *d d'* may be turned or bent at their lower ends, as shown in Figs. 2 and 2^a.

The signal apparatus *e* on the engine consists of an outer casing having in its front a glazed opening *e'* and in which are arranged a pair of plates *f f'*, having the necessary signals marked thereon and working in guides *f*². Each of them is connected to springs *f*³, adapted to raise it up in front of the glazed opening on the releasing of a spring bolt or catch *g*. This bolt or catch is connected to a bell-crank lever *h*. The lever of the front plate *f* is connected by a wire *i*, passing over suitable guide-pulleys, with the center arm *d*, as seen in Fig. 3. The lever of the rear plate *f'* is connected in a similar manner by a wire *i'* with each of the outer levers *d'*.

It will be seen that when either of the arms *d d'* is turned on its pivot by coming against the movable stop its upper end will, in moving to one side, exert a tension on the wire connected with it, which tension will be transmitted to the corresponding bell-crank lever *h* and will draw out the bolt *g*, connected with it, thus allowing one or other of the signal-plates to be operated. The plate will remain raised after the arm resumes its normal

position until the driver moves it down, to facilitate which the top of the case is left open.

When the driver receives the danger-signal from the stop *a*, he will bring the train
5 to rest at a point between the said stop and the main signal. It is necessary, therefore, to provide means to notify him in this position when he can proceed. In order to accomplish this, I arrange a series of rising and
10 falling rails or bars *k* (of which only one is shown in the drawings) at or near the place where the train will be brought to rest. These bars *k* are carried by short arms or levers *k'*, connected with the wires *c'* of the main signal
15 in such a manner that they are raised when the signal is at "line clear" and are lowered when it is at "danger." The position of these rails *k* corresponds to or is in alinement with that of the "line-clear" position
20 of the stop *a*, (indicated by the dotted circle, Fig. 1,) so that one or other of the rods *d'* will pass over them. Suppose the train, therefore, has been brought to rest. When the main signal is put to "line clear" the
25 rails *k* are raised and press against the roller of that one of the outer arms *d'* which happens to be above them, which depends on whether the engine or tender is leading. The rails *k* and levers *k'* are so arranged that in
30 rising their motion is in a backward direction to that of the train, and consequently when they meet the roller they cause the lever *d'* to turn on its pivot in the same direction that it does when engaged by the stop *a*, so causing
35 it to release the plate *f'* and give the "line-clear" signal to the driver, even although the main signal might still be invisible from the position at which the train had come to rest.

Obviously the wires *i i'* might be arranged to operate a miniature signal-arm on the engine, if desired, or instead of the plates *f f'* differently-colored disks could be employed. Moreover, instead of three depending arms
45 on the engine only two might be used, but this would necessitate the employment of a pair of stops *a* to allow for the engine traveling tender first.

By the use of my invention the driver is
50 rendered entirely independent of the main signals and can work as well in densely foggy weather as in clear weather. Moreover, the audible alarm provides a very efficient safeguard against inattention on the driver's part
55 to the signal that is being given.

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

1. In apparatus for signaling on railways,
60 the combination of a main signal, a stop movable transversely to the track, a vertically-

movable rail or bar between said main signal and stop, means for operating said stop, rail or bar, and signal in unison, a signal apparatus on the engine for indicating both "dan-
65 ger" and "safety," and means for causing said stop and rail or bar to operate such signal apparatus, substantially as described.

2. In apparatus for signaling on railways, the combination of a main signal, a transversely-movable stop which is brought mid-
70 way between the rails when the signal is at "danger," and to one side when it is at "line clear," a rail or bar which is raised when the signal is at "line clear," means for operating
75 said signal, stop, and rail or bar in unison, a series of depending arms on the engine adapted to be operated by said stop and rail or bar, and a signal apparatus, also upon the engine,
80 operated by said arms and indicating the same signal as that given by the main signal, substantially as described.

3. In apparatus for signaling on railways, the combination of a series of depending arms on the engine, means working in unison with
85 the main signal for operating one or other of said arms, a spring-actuated signal apparatus on the engine, and means for causing the arm which has been operated to release the said signal apparatus, substantially as described.
90

4. In apparatus for signaling on railways, the combination of a series of three depending arms on the engine, a signal apparatus comprising a pair of spring-actuated plates normally kept in their lowered position by spring-
95 catches, means for causing the center arm to release the catch of one of the plates, and either of the outer arms to release the catch of the other plate, a transversely-movable stop and a rising-and-falling rail or bar for
100 operating the arms according to the signal which is being given, substantially as described.

5. In apparatus for signaling on railways, a signal apparatus on the engine, comprising
105 an outer casing *e* having a glazed aperture *e'*, a pair of plates *f, f'*, corresponding to the signals, a pair of springs *f³* for raising said plates, spring bolts or catches *g* for holding them down, bell-crank levers *h* connected with said
110 bolts or catches, and wires *i, i'*, leading to depending arms on the engine, said arms serving, when operated, to release the catches, substantially as described.

In witness whereof I have hereunto signed
115 my name in the presence of two subscribing witnesses.

GEORGE V. ALLEN.

Witnesses:

CHAS. B. BURDON,
FRED C. HANES.