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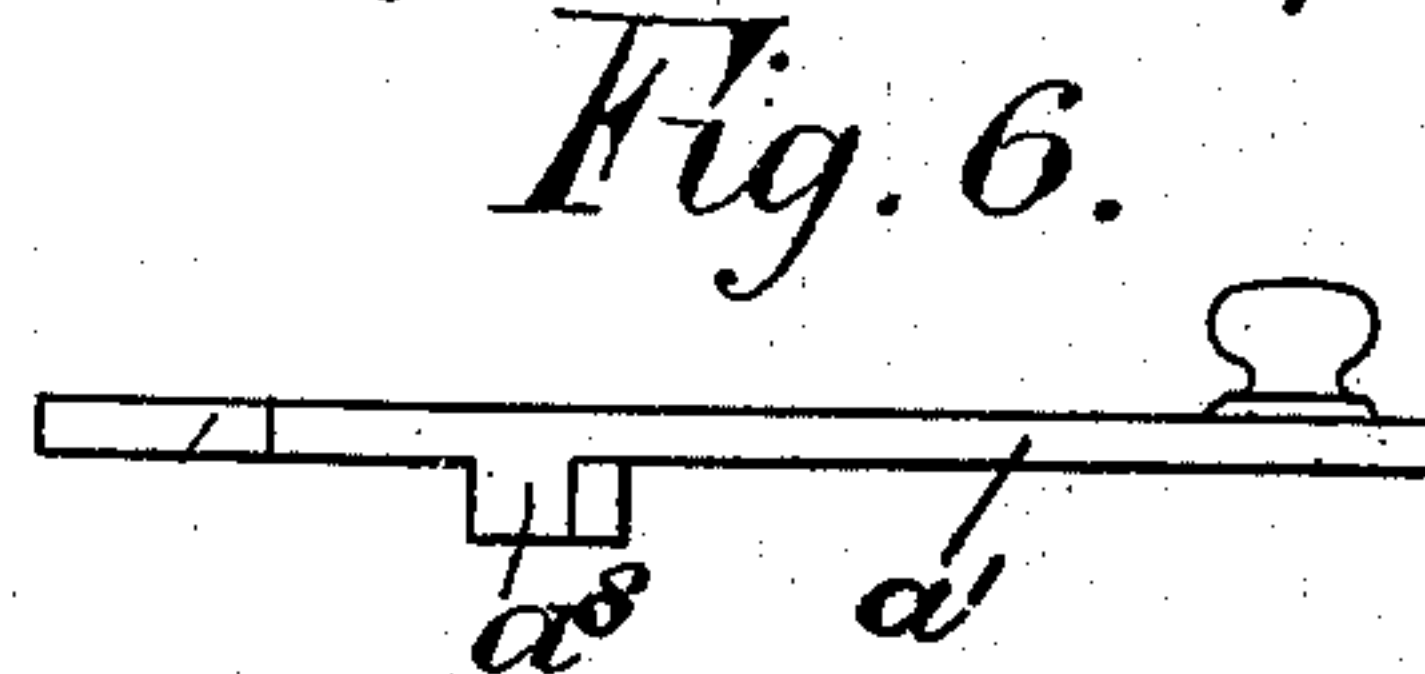
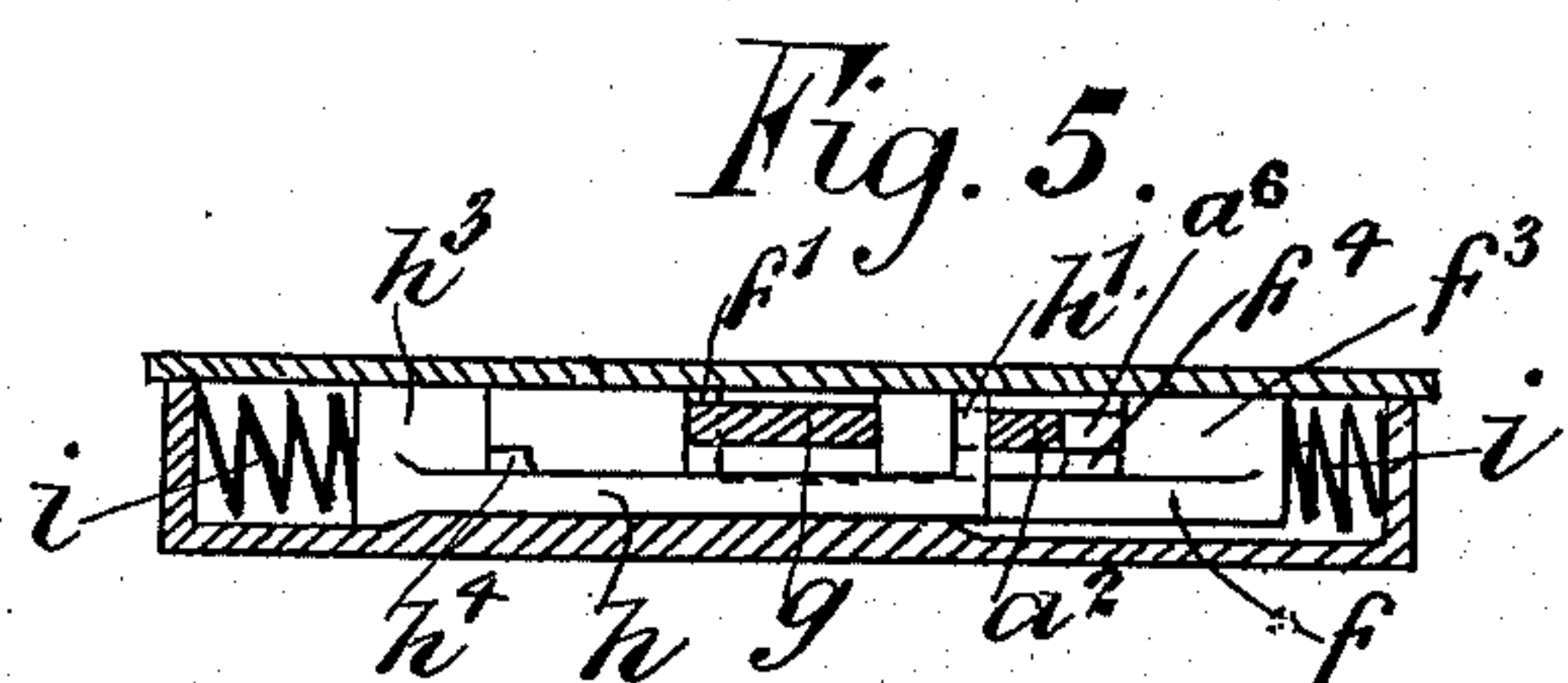
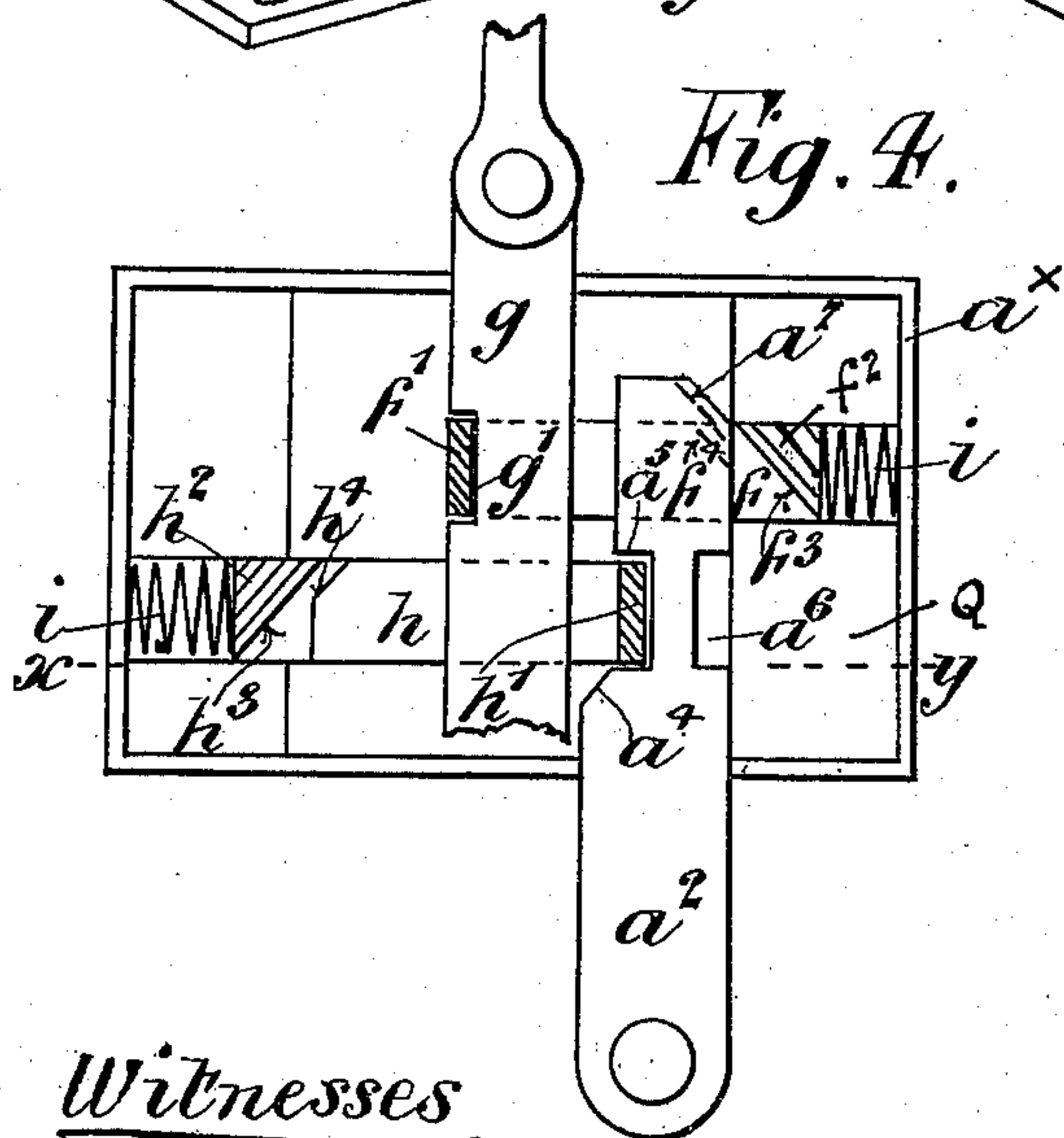
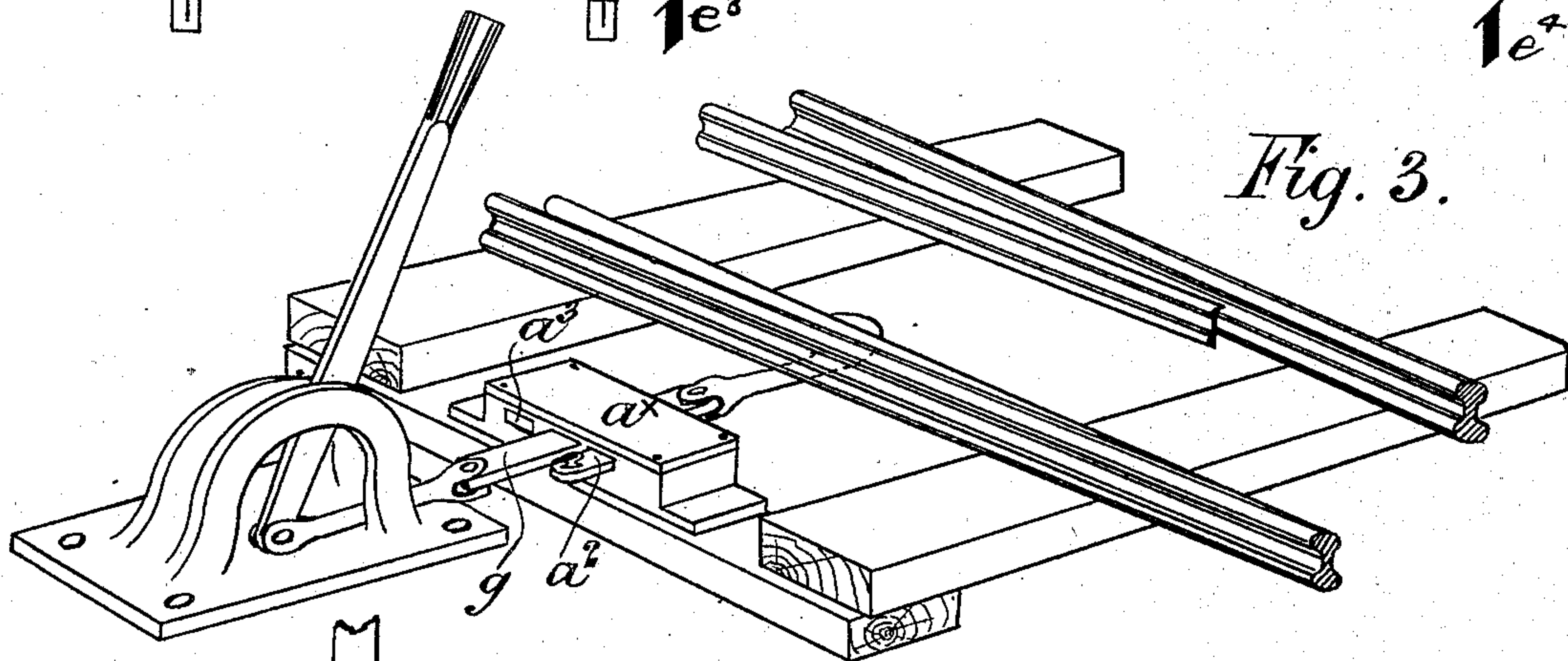
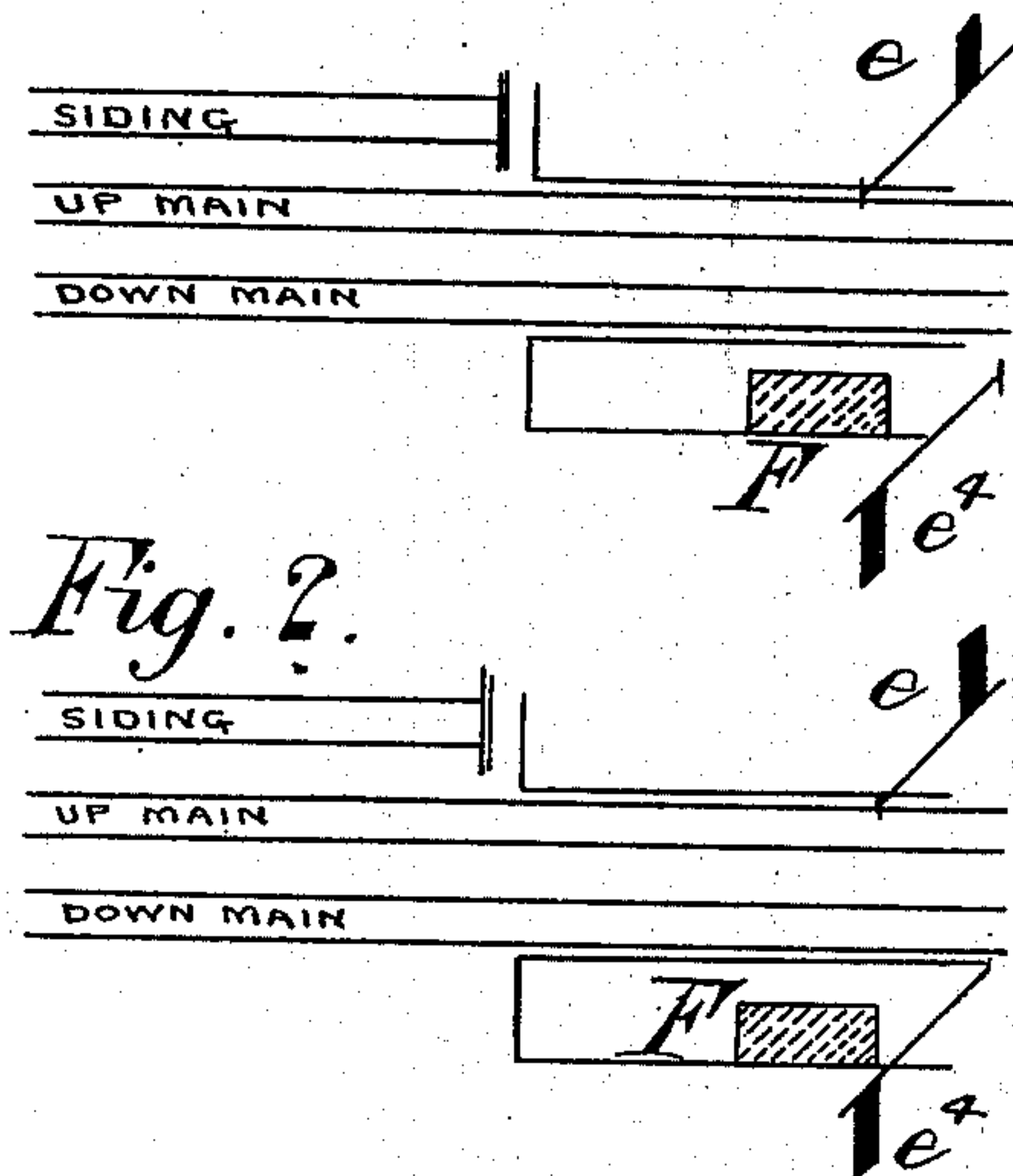
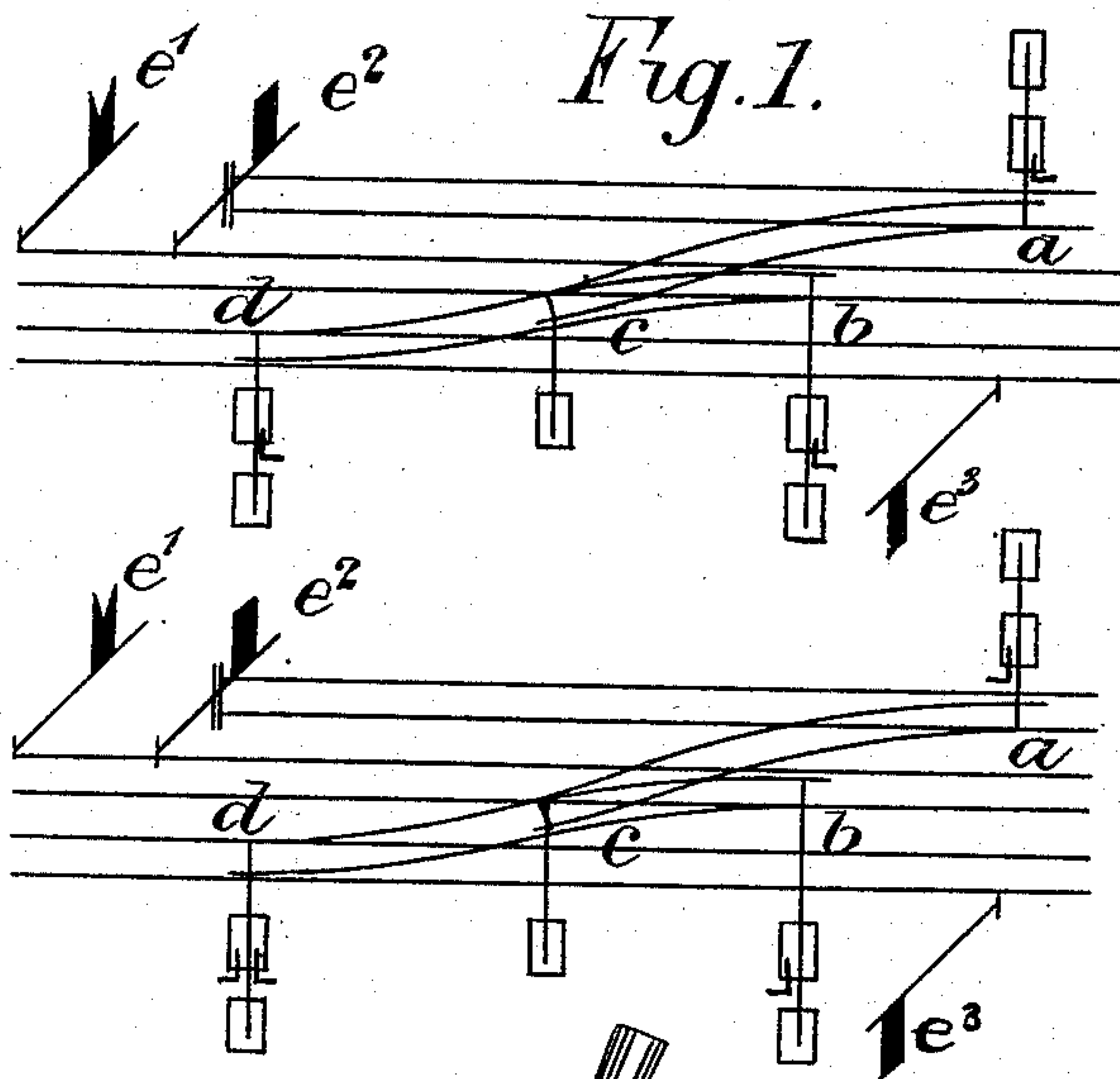
2 Sheets—Sheet 1.

S. T. DUTTON.

APPARATUS FOR LOCKING AND UNLOCKING POINTS, SIGNALS, &c.

No. 416,778.

Patented Dec. 10, 1889.



Witnesses

Arthur Woodman
William Heller

Inventor

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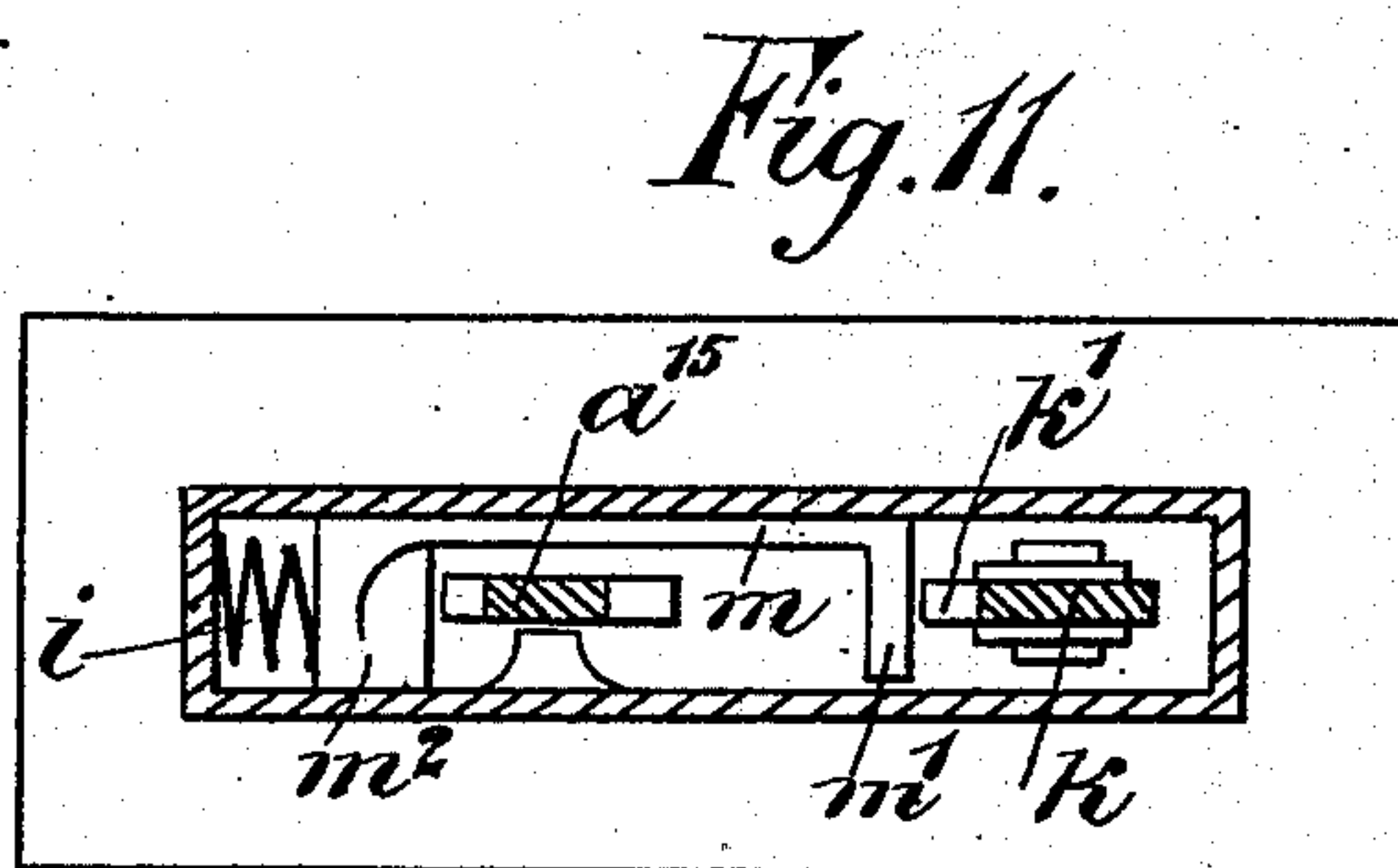
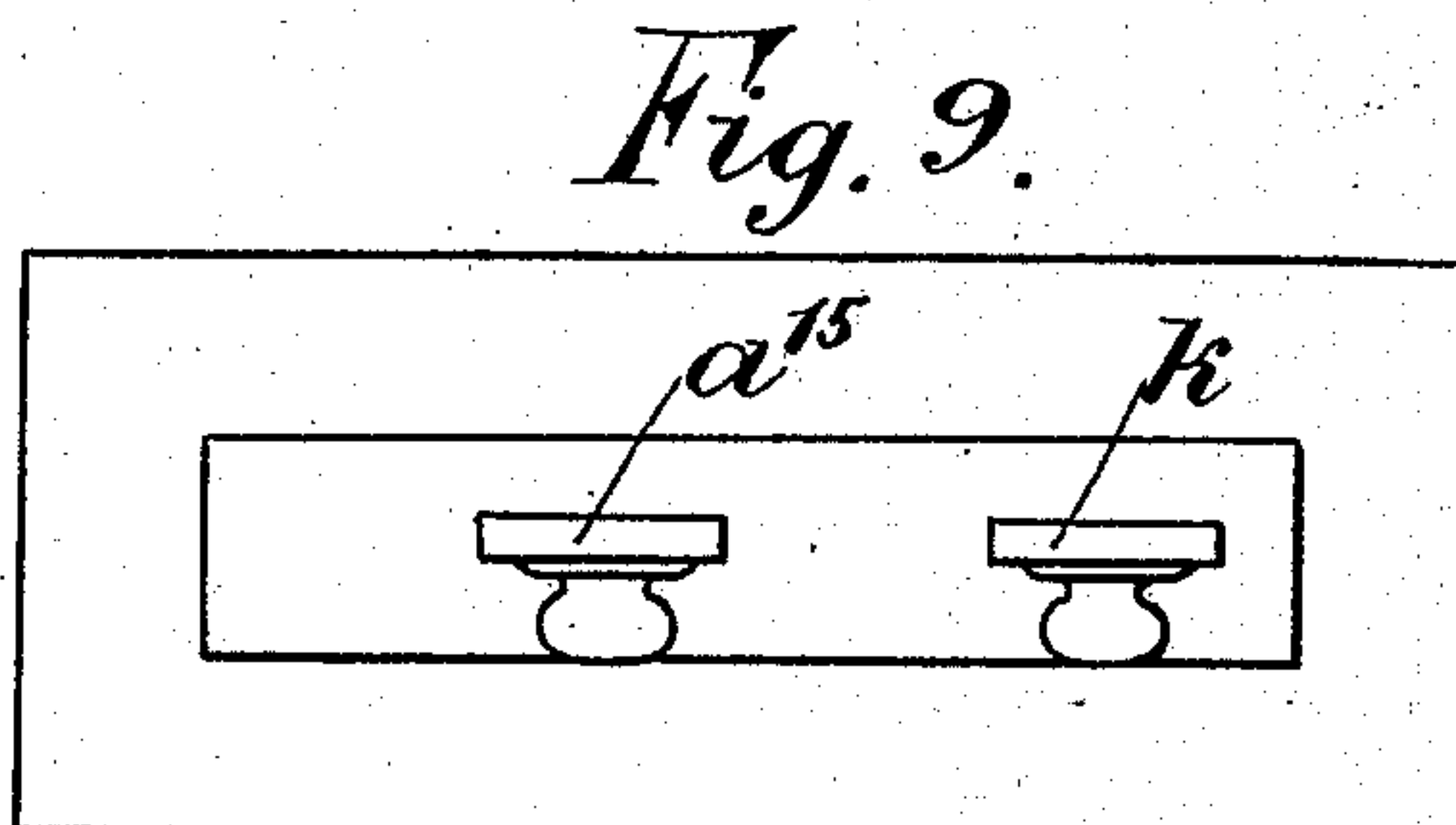
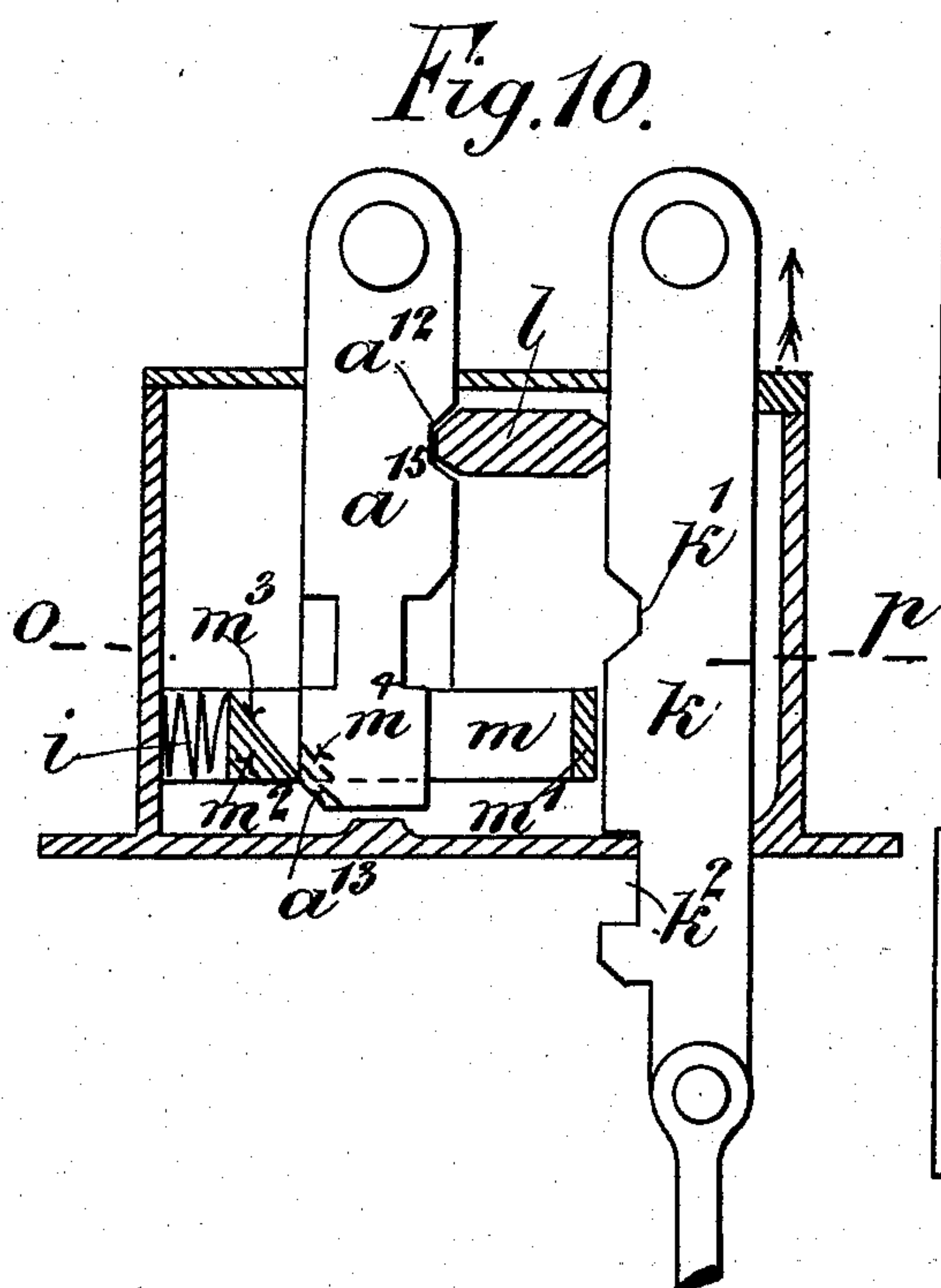
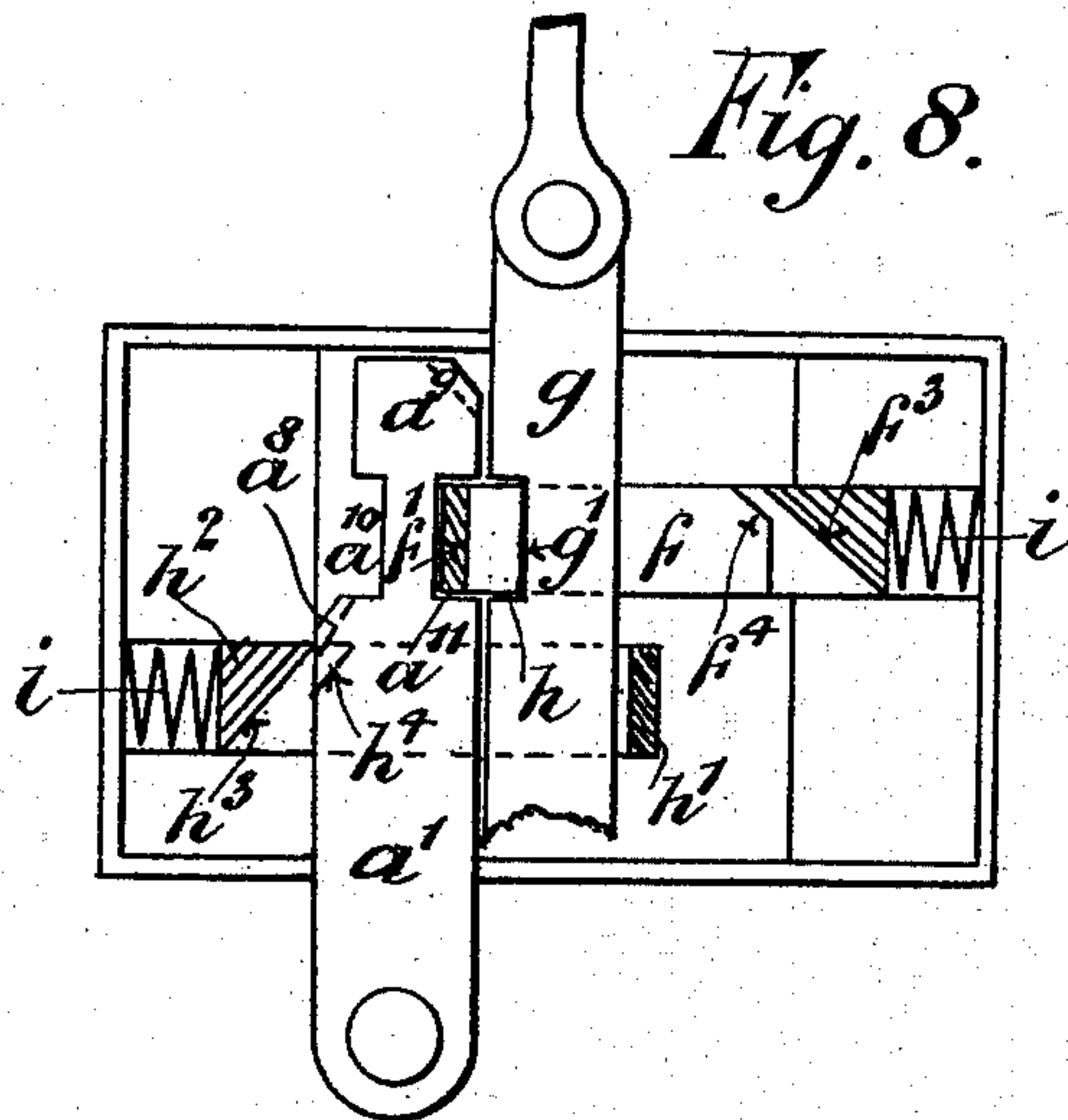
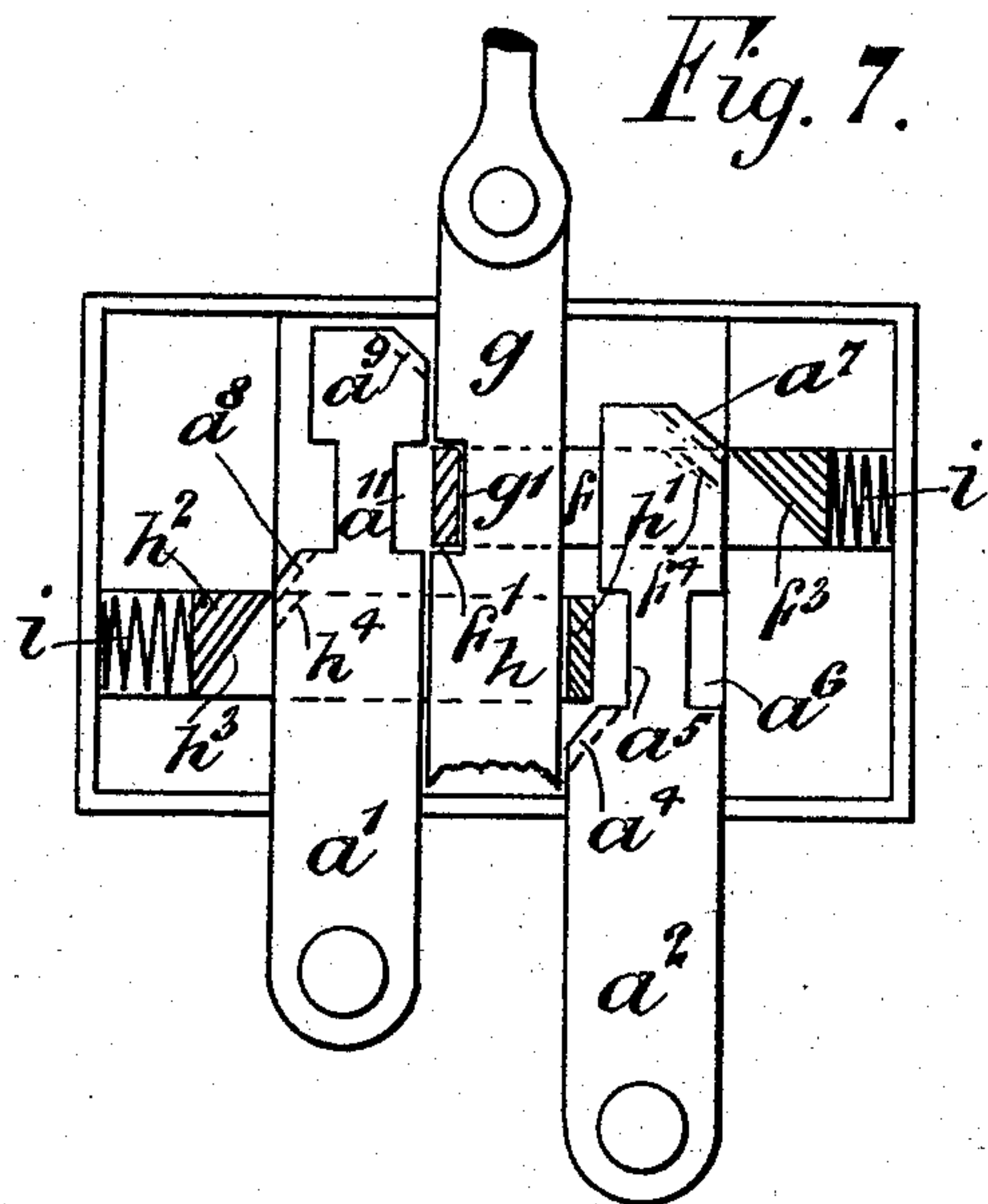
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UNITED STATES PATENT OFFICE.

SAMUEL TELFORD DUTTON, OF WORCESTER, COUNTY OF WORCESTER,
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APPARATUS FOR LOCKING AND UNLOCKING POINTS, SIGNALS, &c.

SPECIFICATION forming part of Letters Patent No. 416,778, dated December 10, 1889.

Application filed July 30, 1889. Serial No. 319,229. (No model.) Patented in England July 20, 1888, No. 10,531.

To all whom it may concern:

Be it known that I, SAMUEL TELFORD DUTTON, civil engineer, a subject of the Queen of Great Britain, residing at Marl Bank, in the city and county of Worcester, in England, have invented certain new and useful Improvements in Locking and Unlocking Points and Signals and Detecting the Position and Movement of Points on Railways, which improvements are also applicable to the locking and unlocking of turn-tables, gates, and other structures and things appertaining to railways, (for which I have received Letters Patent in Great Britain, dated July 20, 1888, No. 10,531;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object the locking and unlocking and detecting the movements of points and signals of railways when such points are distant from a station and are isolated and unconnected with each other and not under the direct manipulation of the signalman.

My invention consists in the construction and arrangement hereinafter described of the parts of mechanism whereby the separated points can only be locked and unlocked by the use of a prime master tappet or key operating on and influencing the action of a series of secondary tappets in such a manner that the several points can only be locked and unlocked in the desired succession. The rod connected with each point is jointed to a flat bar having a sliding motion in a box or case fixed outside the rails and near the points. The said bar has a notch near the middle of one of its sides. Crossing the said bar at right angles are two sliding bolts working side by side and pressed inward by coiled springs. The end of each of these sliding bolts is turned up, the turned-up end of one bolt being situated on the notched side of the flat bar, and having a form and shape suitable for engaging in the notch in the side of the bar. The turned-up end of the other sliding bolt is situated on the plain side of the sliding bar. The rear end of each bolt has

an incline, by pressure on which the bolt is withdrawn and its spring compressed. In the side of the box or case are two openings situated, respectively, one on each side of the flat bar. These openings are of a size and shape suitable for the introduction into the said box of the tappets, hereinafter described. The tappets and openings in the box have such sizes and shapes that the said tappets can only be introduced into the proper openings in the box. The tappets referred to consist of flat bars of suitable shape, having inclined surfaces or projections on the sides or broad faces, besides the inclined surfaces or bevels on their edges to move the cross-bolts and notches for the purpose of being locked in certain positions by the same. The flat bar which is connected with the points may be situated below the level of the tappets, and the inclines and notches on them may be on one side only, and return inclines provided on the tappets and cross-bolts to insure the movement of the latter when the tappets are withdrawn.

I will now describe my invention, reference being made for that purpose to the accompanying drawings.

Figure 1 is a diagram of three lines of railway, say an up and down passenger line and a siding. As the means for the interchange of traffic, and as affording a simple illustration for the application of my invention, I have shown a series of four pairs of points, forming a through-road and a slip-crossing. The points marked *a* in the siding I will take as the first pair in the series. For a movement from the siding to down main line the next pair of points would be *d*. It will be readily understood that the points marked *c* are intermediate points, and are normally right for a traffic movement from the down main to the up main, or vice versa. These points *c* therefore only need to be shifted for a traffic movement from the down main to the siding, and for this purpose should be moved by hand. For a movement in the opposite direction they may or may not be worked, as, if they are weighted points, the train will, as known in the art, make its own direction or force the points open to pass

through them, the points falling back to their normal position as soon as the last vehicle has cleared them. The points c should not be used unless points a or d are worked. It will be sufficient, therefore, if, for the purpose of this description, I do not apply my invention to them. A loose key or master tappet—say a' —is supposed to be at the station, or in the signal-box, or in the care of the person in authority. Wherever it is, so long as it is not in the initial box of the series, it may be taken as a sign that the series of points are locked and secured. Suppose, for example, the levers working the conflicting or block signals are concentrated in a signal-box. Then the master-key or tappet a' is normally attached to these levers in such a manner that it can only be withdrawn for the purpose of unlocking any pair of points in a series after having locked all the conflicting signal-levers in their "danger" position. Should, however, the conflicting signals not be worked by levers concentrated in a suitable spot, then the master key or tappet would be normally on the signal-post of any conflicting signal, and, by suitable mechanism known in the art, it could only be withdrawn after locking that signal in the "danger" position. In this instance it might be necessary to take this master-tappet and go through a similar performance upon another conflicting signal, locking that in the "danger" position before the secondary tappet or key withdrawable from that signal could be inserted in the first locking-box of the series of points that is required to be opened or released. It will be sufficient, however, to suppose that the levers working the conflicting signals e' e^2 e^3 e^4 are concentrated on the platform at F, and that the master tappet or key a' is normally inserted in suitable connection with the said conflicting signal-levers, so that before it can be withdrawn all the said signal-levers must be locked at "danger." When the tappet a' is withdrawn from F and inserted in the box a^x , located at a , it releases another tappet a^2 in the said box, and the withdrawal of the said tappet a^2 from the box releases the blade g , connected to the switch-points. The switch-points at d are normally locked and can only be released by the withdrawal of a releasing-tappet from box a^x located at a or b . I will describe the unlocking for a movement from the siding to the down main. Therefore the releasing-tappet from the box a^x at a is inserted in the similar box at d , thereby unlocking the blade connected to the switch-points and allowing the points to be worked. When the releasing-tappet a^2 from the box a^x was withdrawn, it back-locked the master-tappet a' in the box, so that it could not be withdrawn. The reverse action is that the switch-points at d must be replaced normal, allowing the tappet a^2 to be withdrawn from the box, this action locking the said switch-points in their normal position. The said switch-points at a are now replaced normal, the tappet a^2 re-

inserted in the box, this action locking the said switch-points in their normal position and taking the back-lock off the master-tappet a' , thus allowing it to be withdrawn, which act of withdrawal again locks the tappet a^2 in the said box, effectually preventing its withdrawal. The master key or tappet a' is now inserted in its position at F, so that the main sectional signals can be worked, the working of any one of which locks the master key or tappet in position, thereby indirectly locking the whole series of points.

Fig. 2 is simply a repetition of Fig. 1, intended to show the switch-points unlocked, with tappets inserted, allowing the movement from the siding to the down main previously referred to.

Fig. 3 is a perspective sketch showing the method of connecting my apparatus between the switch-points and their actuating ground-lever. In this figure, g is the blade intermediate between the switch-points and their lever, and a^2 is the tappet to be withdrawn before the switch-points are free to be moved. a^x is the box containing the apparatus. a^3 is the space for the insertion of the master key or tappet a' .

Fig. 4 is an enlarged view of my locking apparatus shown in Fig. 3. In this figure, g is the tappet or blade connected to the switch-points. g' is a square notch into which takes, in the normal condition of the apparatus, as shown, a raised projection f' on a cross-bolt f , the said cross-bolt f being held in the position shown for locking the blade g at the notch g' by the tappet or key a^2 offering a straight surface to the raised portion f^2 of the cross-bolt f . It will be observed that the tappet or key a^2 is itself held locked in a somewhat similar manner by the raised piece h' of the cross-bolt h being inserted in the notch a^5 of the tappet a^2 . A coiled spring i is provided to prevent the cross-bolt h from moving out of the notch a^5 through vibration or other cause.

Fig. 5 is the cross-section at xy of Fig. 4, in elevation, with the solid or hollow part in elevation, as the case may be, taken away to allow a better view of the bolt f and spring i .

Fig. 6 is a side view of the master tappet or key a' , showing the projecting bevel a^8 .

Fig. 7 shows the master key or tappet a' inserted and the tappet a^2 free. The action of inserting this master tappet or key a' is as follows: The projecting bevel a^8 , acting against the bevel h^3 of the raised block h^2 on the cross-bolt h , travels through the incline between h^3 and h^4 , thereby compressing the spring i and withdrawing the bolt h' from the notch a^5 of tappet a^2 , causing it to be free.

Fig. 8 is a view showing the secondary tappet a^2 in its turn withdrawn. The result is as follows: In the act of withdrawal the projecting bevel a^7 , in traveling through the inclined recessed passage between f^3 and f^4 , forces the cross-bolt f so that the raised por-

tion leaves the notch g' and enters the square notch a^{11} of master-tappet a' , thereby backlocking that tappet or key and preventing its withdrawal. The spring i maintains the lock f in the notch a^{11} . The blade g is therefore free, and consequently the points also. The tappet or key a^2 is taken to the next lock of the series, and performs there duties analogous to a' in the box described.

Fig. 10 shows one method of applying my invention in the signal-box. In this figure, a^{15} is the tappet, and is shown locked by the bevel-lock l being inserted in the notch a^{12} . The tappet k is connected to the lever in the locking apparatus, working the conflicting signal, which signal is supposed to have been worked to the "safety" attitude, thereby locking the master-tappet, as described. When, however, the signal-lever is replaced normal, the tappet k is moved in the direction of the arrow, so that the notch k' moves in front of the lock l and the square notch k^2 in front of the raised piece m' of the cross-bolt m . Now, when the tappet a^{15} is withdrawn upward, the lock l is forced into the notch k' and the projecting bevel a^{13} , traveling through the recessed incline between m^3 and m^4 , forces the bolt in toward the tappet k , so that the raised piece m' enters the square notch k^2 . The spring i retains the lock m in the notch k^2 .

Fig. 9 is a plan on top of the apparatus in Fig. 10, and Fig. 11 is a sectional plan through O P of Fig. 10. In cases where a series of points are to be locked they may, when desired, be operated upon in groups only, instead of in a series from beginning to end. For example, when there are six in the series it may be desirable to be able to operate on the last four or upon the last two without operating on the first two or the first four. To effect this, the prime or master tappet may have connected to it, by joints or otherwise, two supplementary tappets, one of which is of a shape suitable for unlocking the third point of the series, and consequently permitting of the unlocking of the succeeding ones. The other supplementary tappet may be of a shape suitable for unlocking the fifth point, and

consequently permitting the unlocking of the last. This modification is applicable to any number of points.

My said invention may be applied to the locking and unlocking of stop-blocks, gates, turn-tables, and other moving parts of railways and things appertaining to railways.

What I claim is—

1. The combination, with a blade for operating the points of a spring-pressed cross-bolt normally locking said blade, a tappet adapted to operate the cross-bolt, a second cross-bolt normally locking said tappet, and a master-tappet adapted to operate the second cross-bolt, thereby unlocking said tappet and permitting it to be moved to unlock the said blade and lock the said master-tappet, substantially as set forth.

2. The combination, with a series of similar point-locking devices, each consisting of a blade for operating the points, a spring-pressed cross-bolt normally locking said blade, a tappet adapted to operate the cross-bolt, and a second cross-bolt normally locking said tappet, of a master-tappet adapted to operate the second cross-bolt of one of the said locking devices, thereby unlocking its said tappet and permitting it to be moved to unlock the said blade and lock the master-tappet of that said locking device, the said tappet unlocked from the said first locking device so operated being further adapted to form the master-tappet for operating the second cross-bolt of a second locking device in the said series to release its tappet and in turn to become locked, substantially as set forth.

3. The combination, with a blade, such as k , for operating the points of a signal, of a spring-pressed cross-bolt normally locking said blade, a tappet adapted to operate the cross-bolt and release said blade, and a second cross-bolt or lock, such as l , adapted to be moved to lock and release said tappet.

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Witnesses:

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