

(No Model.)

3 Sheets—Sheet 1.

G. N. REIFF.

RAILROAD SIGNAL APPARATUS.

No. 352,779.

Patented Nov. 16, 1886.

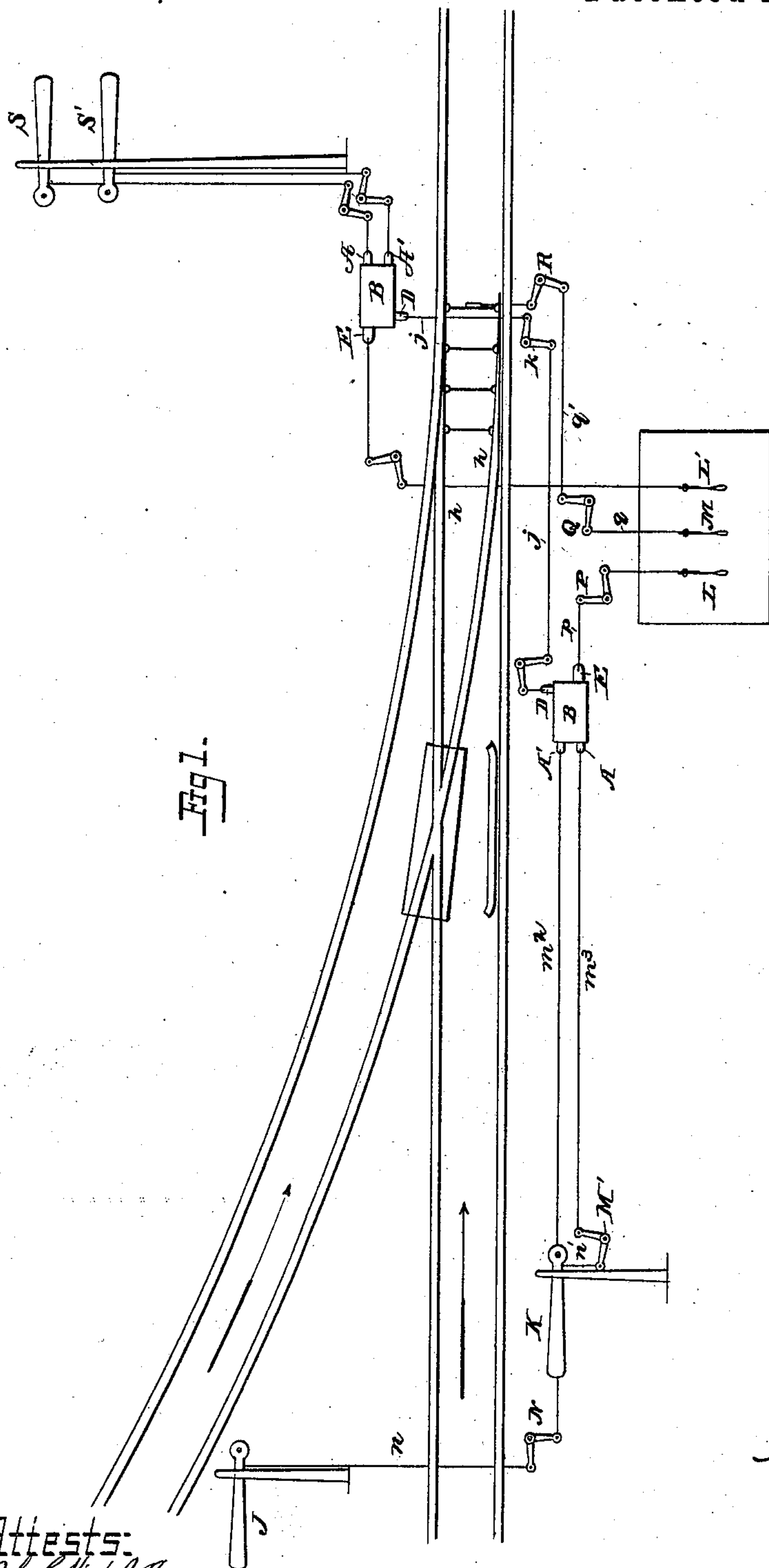


Fig. 1.

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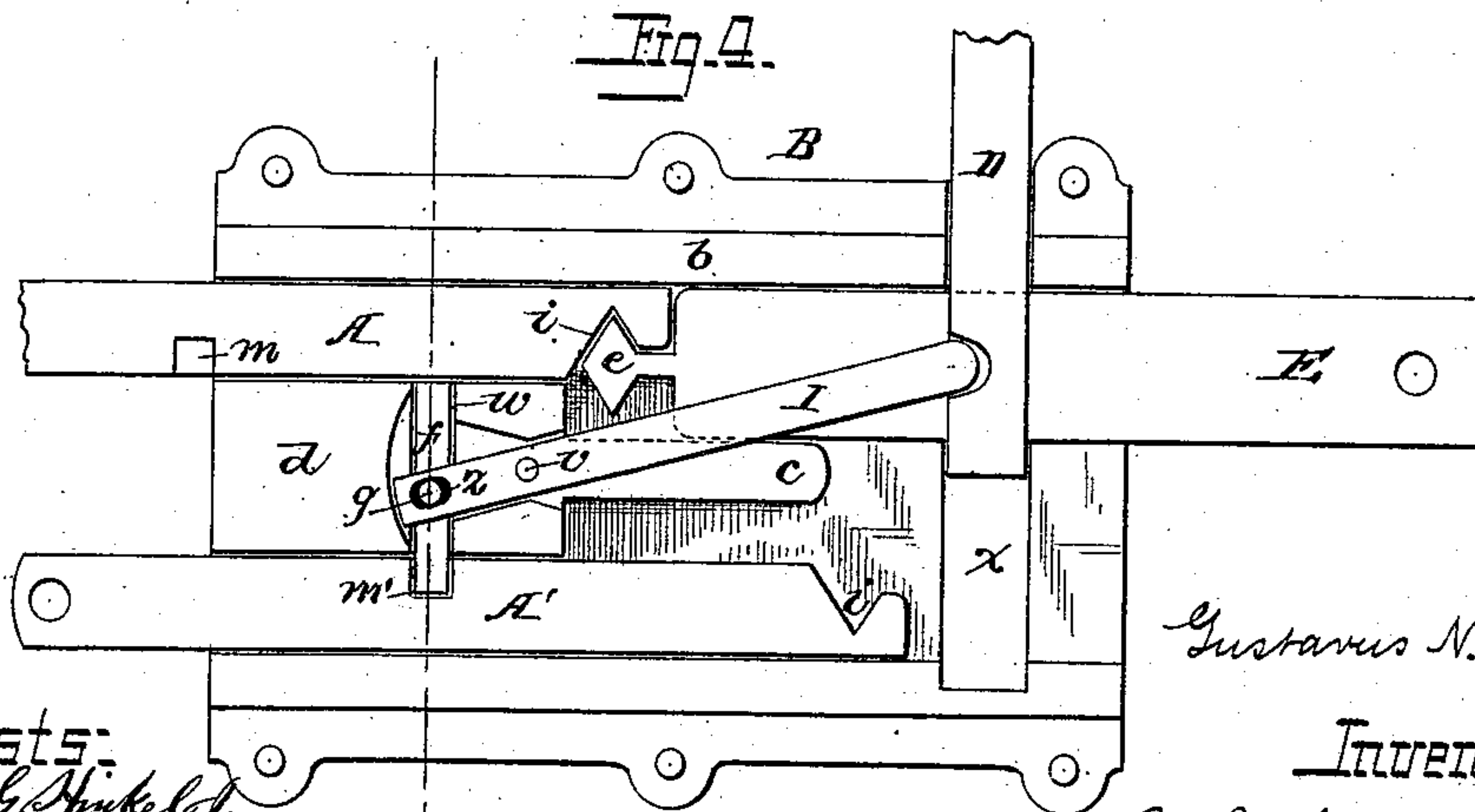
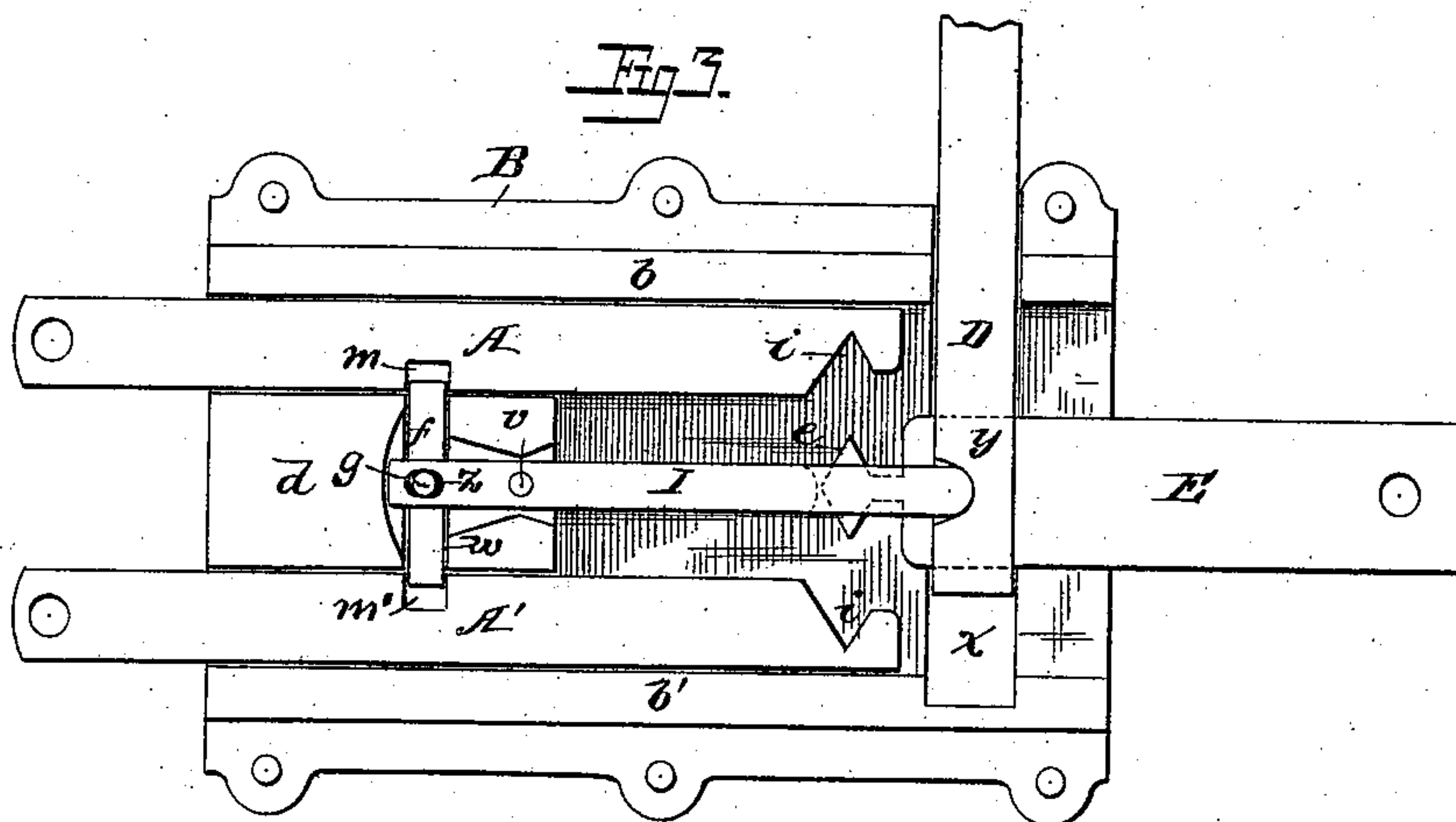
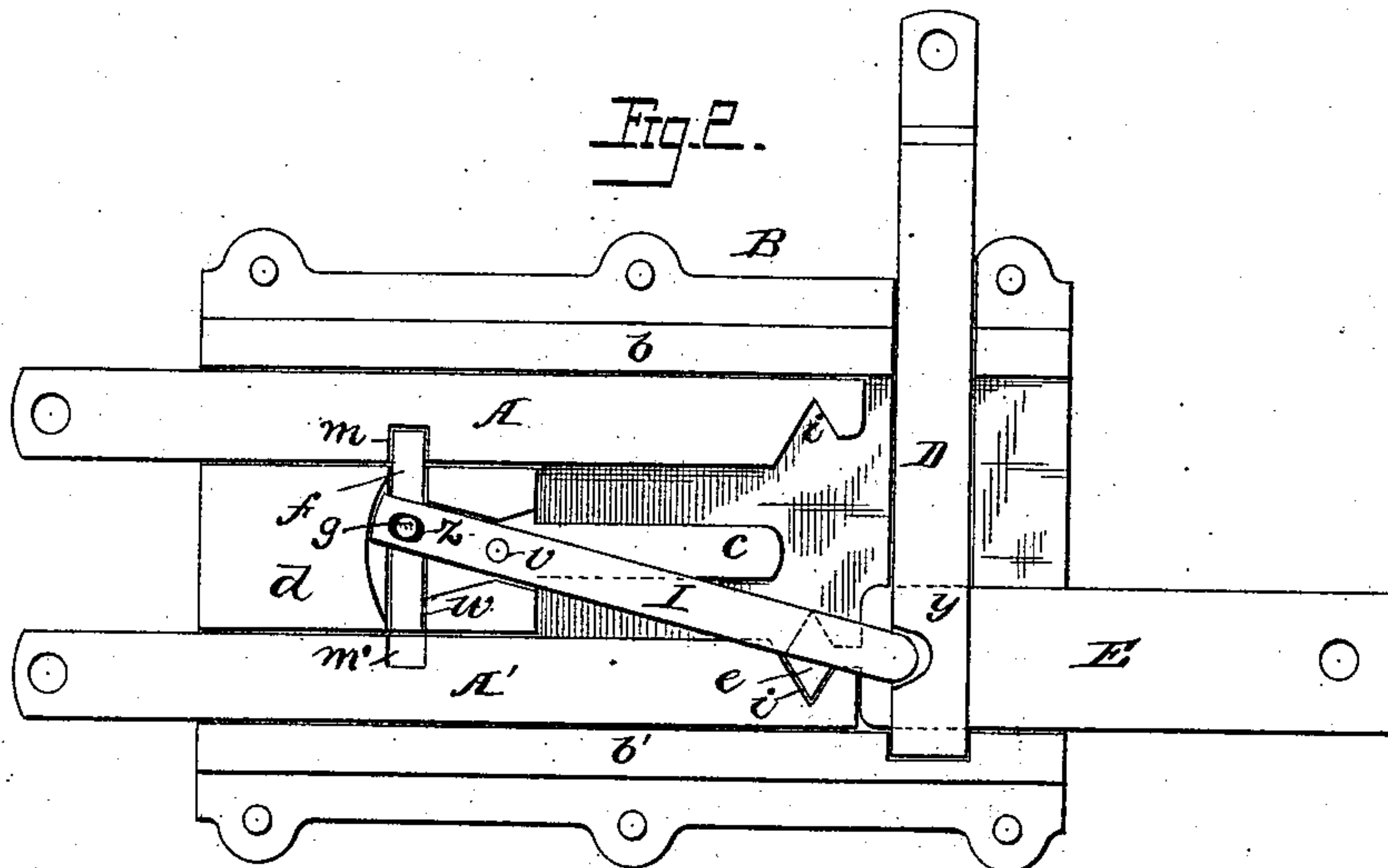
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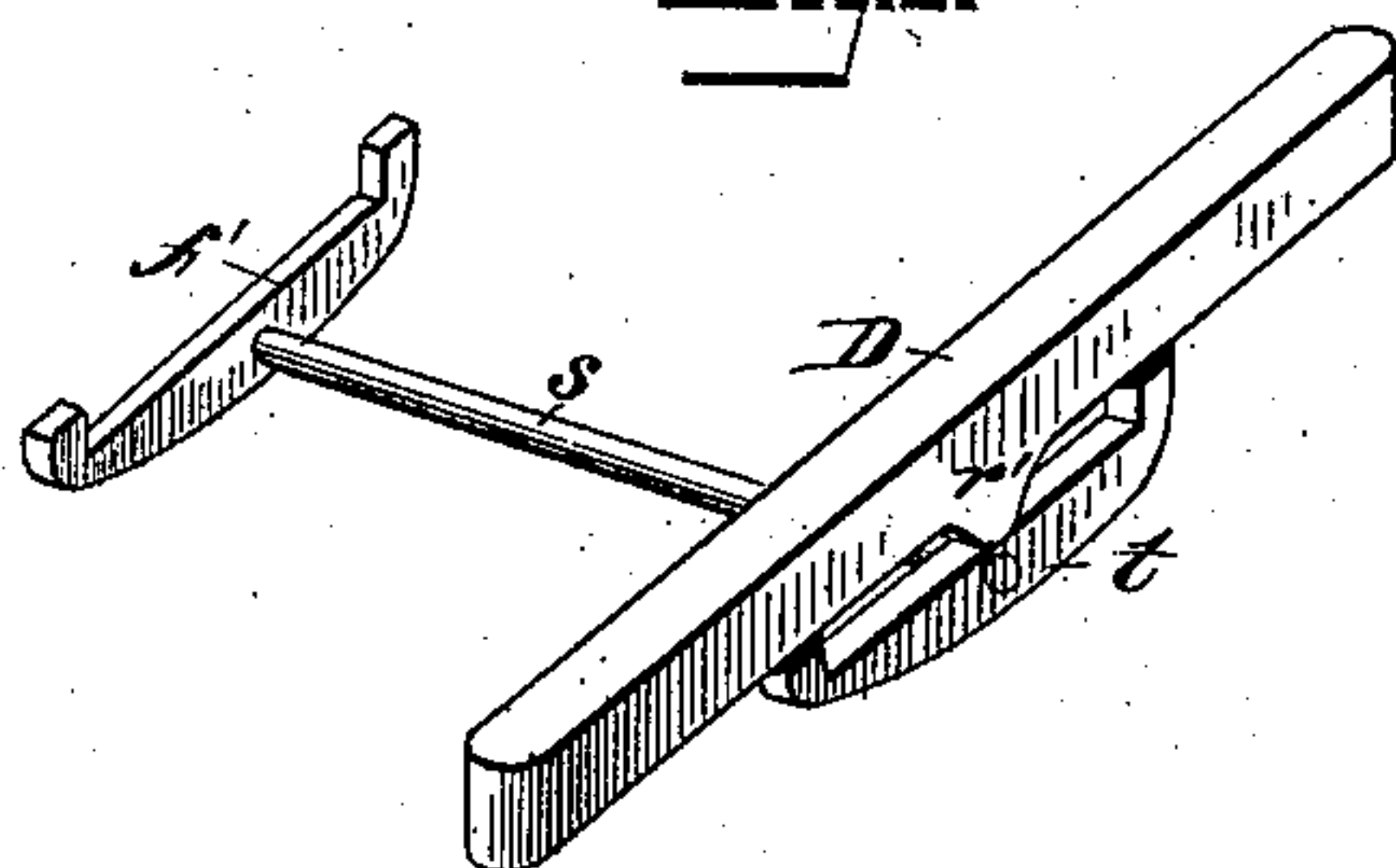
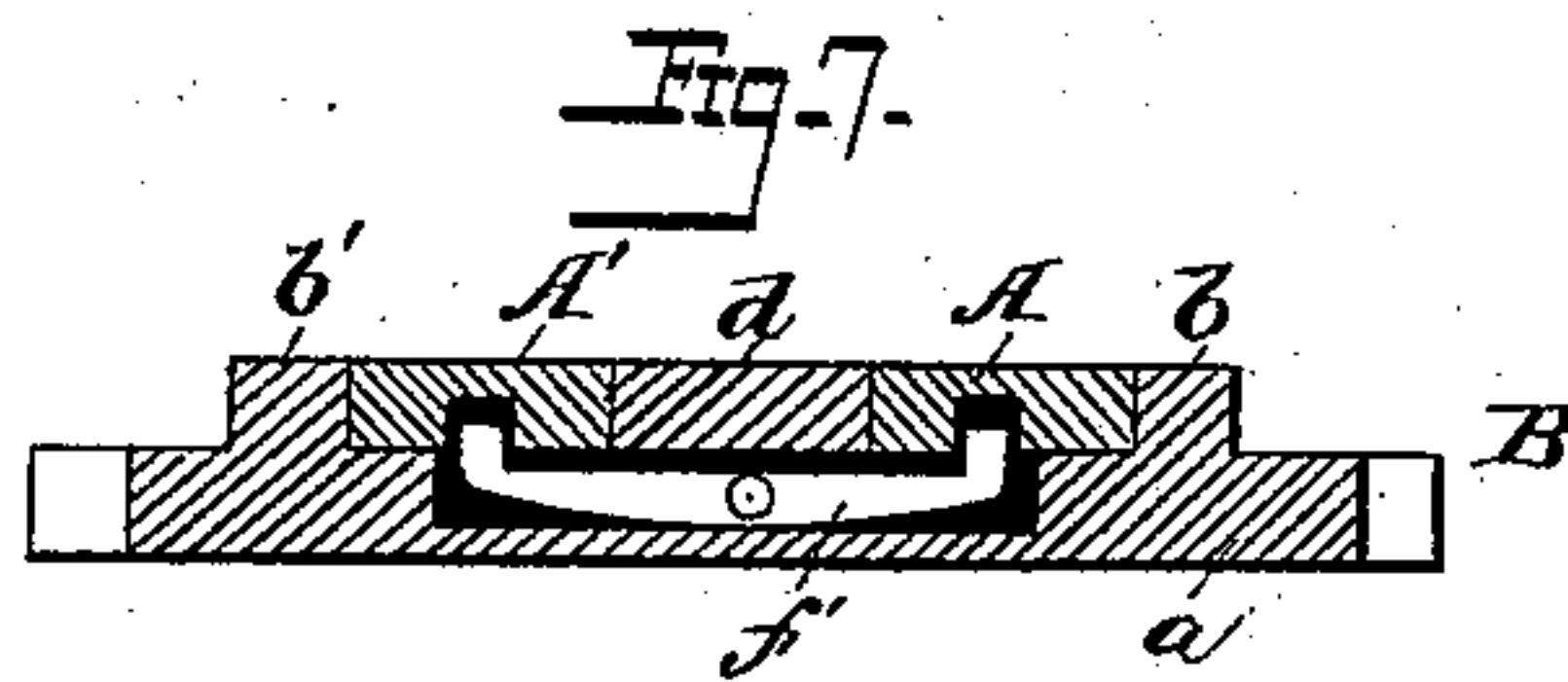
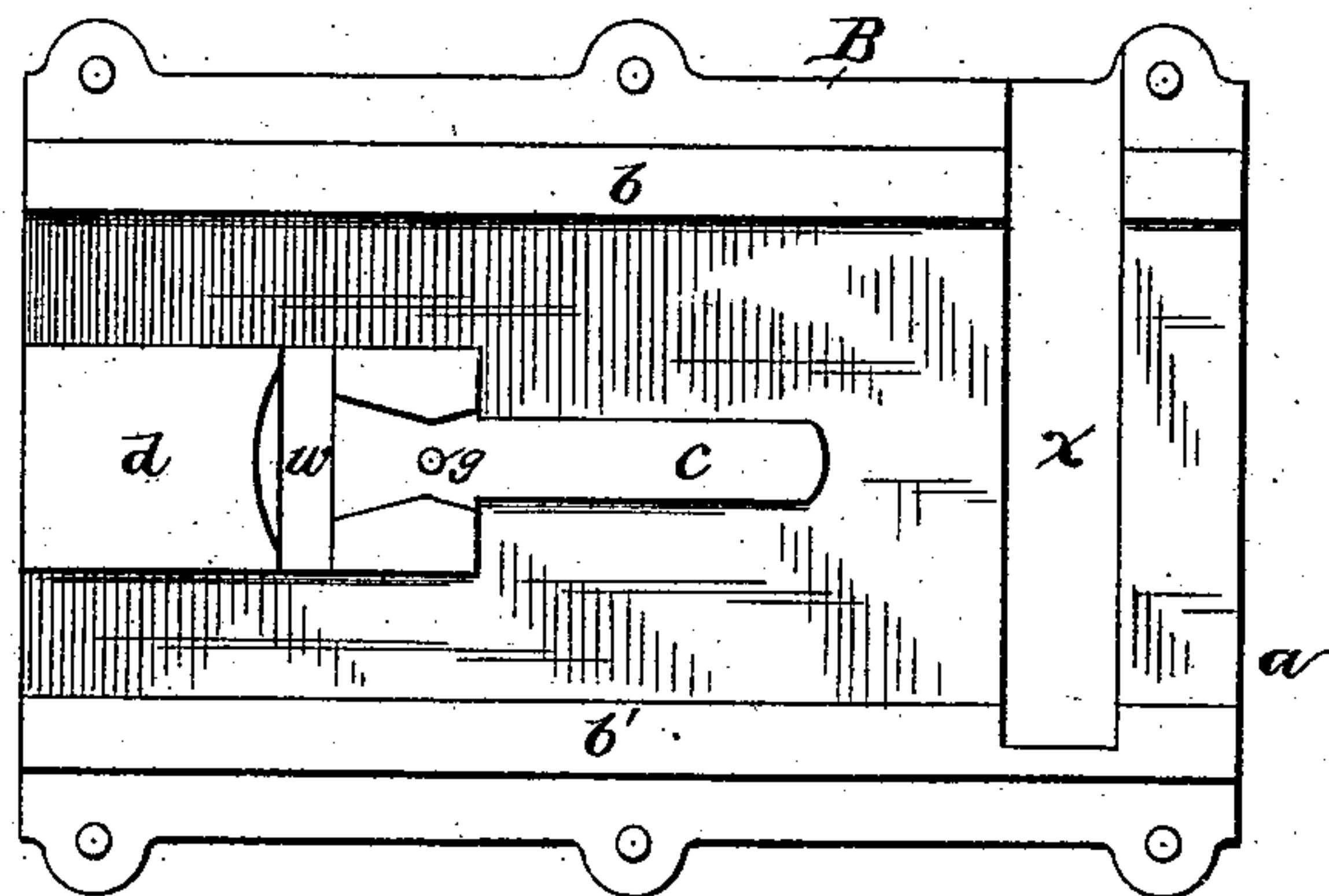
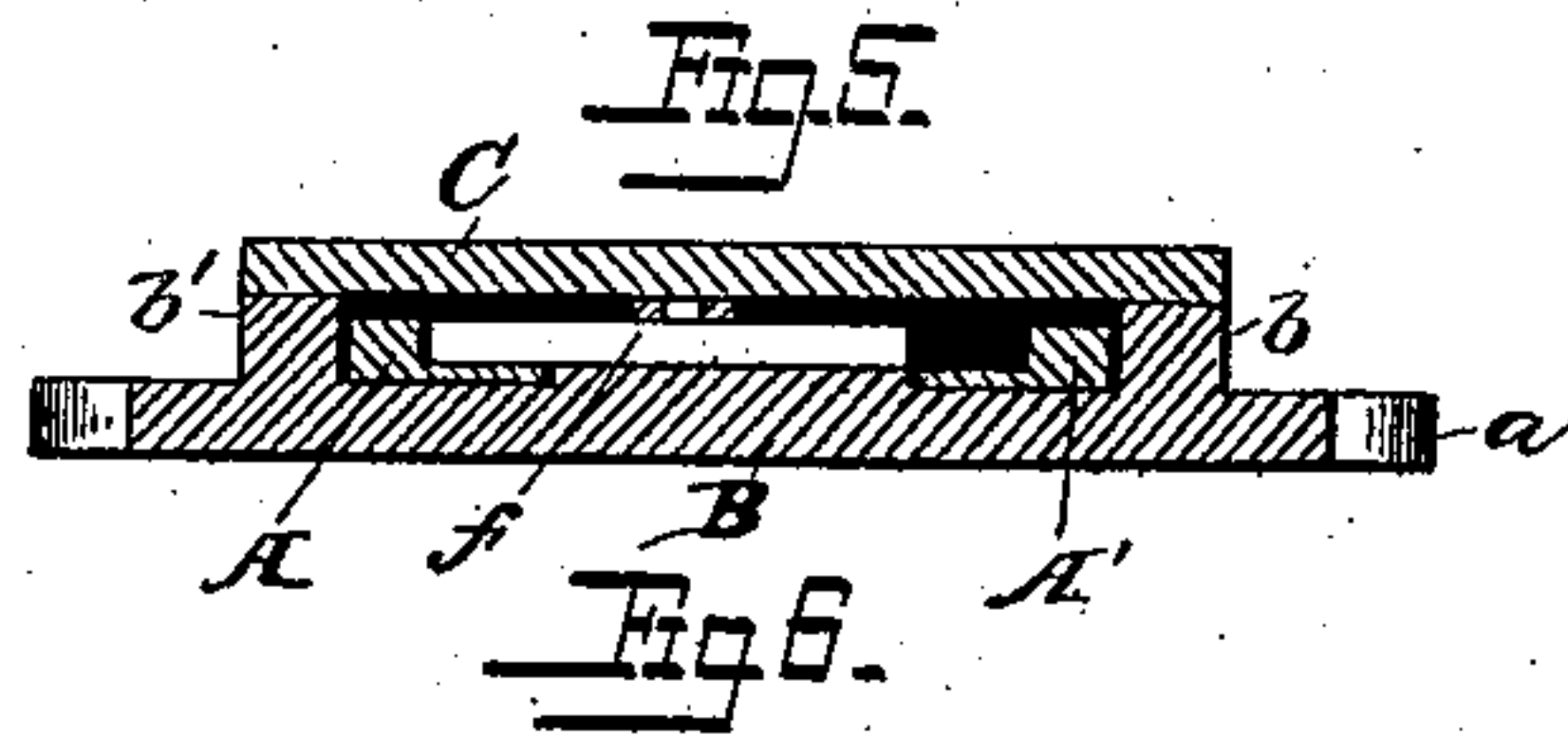
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UNITED STATES PATENT OFFICE.

GUSTAVUS N. REIFF, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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RAILROAD-SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 352,779, dated November 16, 1886.

Application filed December 8, 1885. Serial No. 185,203. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVUS N. REIFF, a citizen of the United States, and a resident of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Railroad Signaling Apparatus, of which the following is a specification.

My invention relates to that class of switch and signaling devices in which two signal-bars connected to different signals are operated from a single signal-lever or other operating device through the medium of connections which are shifted as the switch-rails are set to different positions; and my invention consists in the combination, with the signal-bars, of a slide connected with the signal-lever and shifting-connections between the slide and the switching devices or switch-rails, and in the use, in connection therewith, of a locking device, whereby both signal-bars are locked until one or the other of them is in connection with the bar-operating appliances, and in the construction and arrangement of parts, all as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic plan view showing my improved device in connection with the signals, switch, signal and switch levers, and main and branch rails of a junction of a single-track railway. Fig. 2 is a plan of the improved device, the cap of the box being removed. Figs. 3 and 4 are plan views of the parts shown in Fig. 2, illustrating the said parts in different position. Fig. 5 is a transverse section on the line 1 2, Fig. 4. Fig. 6 is a plan view of the box supporting the signal and shifting bars, the cap removed. Fig. 7 is a transverse section. Fig. 8 is a perspective view illustrating a modified form of signal-bar-locking device.

In my improved device there are two signal-bars, A A', which slide in a box, B, provided with a base-plate, a, a cap-plate, C, and with ribs b b' c, and central block, d, the latter and the ribs b b' constituting guides for the signal-bars, which slide parallel to each other in the box between the ribs and the central guide-block as bearings. A transverse groove, x, in the base of the box, extending through the

rib b and into the rib b', constitutes a guide for and receives a shifting-bar, D, in which is a slot, y, for the passage of a slide, E, the end of the latter being formed into a head, e, adapted to recesses or bearings i of the signal-bars, so as to engage and connect with the latter when the slide is carried to one side or the other, as hereinafter set forth.

With the parts above described I employ a locking device of any suitable character, so arranged and constructed as to lock both the bars in the position shown in Figs. 1, 2, and 3, whenever the slide is in a mid-position, or out of contact with either bar, and so that when the slide is in contact with either bar, or in a mid-position, the other bar only will be locked.

One locking device which has proved effective is illustrated in Figs. 2 to 5, and consists of a bolt, f, sliding transversely in a groove, w, in the face of the block d, and a lever, I, vibrating upon a pin, v, projecting from the block d, and having in the opposite end a slot, z, receiving a central pin, g, projecting upward from the bolt f. The bolt f is adapted to notches m m' in the inner edges of the signal-bars A A', and is of such length that when moved laterally to its full extent into the notch of one bar its opposite end will be flush with the side of the block d and wholly out of the notch of the opposite bar, whereby a very slight movement of the bolt toward its central position will cause it to occupy a place in the notches of both bars, and thereby prevent both of them from moving longitudinally.

The longitudinal movement is imparted to each signal-bar by the longitudinal movement of the slide E, which, to effect the movement of the signal-bar, is brought toward the latter until the head e engages in the notch i of the bar to be moved, when the reciprocation or sliding movement of the slide E will carry with it the bar with which the slide is in connection. The slide is brought into operative connection with either bar by shifting the position of the carrier-bar D, and this shifting of the bar D by vibrating the lever I imparts a reverse movement to the bolt f, so as to withdraw one end thereof from engagement with the bar toward which the slide is shifted, while the opposite end remains in the notch of the

opposite bar and locks the latter in position, while the bar to which the slide has been brought may move freely in connection with the said slide.

5 In the application of the above-described device, in connection with the signals and switch of a railway, the carrying-bar is connected to the switch-tongue or rails, and each of the signal-bars A A' is connected to one of
10 the signals.

The device may be used in connection with various arrangements of switches and different characters of signals. I have shown it in Fig. 1 in relation to the switch at a junction and to
15 the signal K of the main line, the signal J of the branch line, and the signal-lever L and switch-lever M of a gang of levers—as, for instance, the levers of a Saxby & Farmer signal and switch device.

20 In the arrangement shown in Fig. 1 the carrier-bars D are connected to the switch-rails *h h* by rods *j j* and crank *k*. The signal-bar A' is connected by a rod, *m*², to a crank-lever, N, and the latter is connected by a rod, *n*, to the
25 signal J. The signal-bar A is connected by a rod, *m*³, to a crank-lever, M', which operates the signal K. The slide E is connected by a rod, *p*, to a crank-lever, P, which is connected with the operating hand-signal lever L, and
30 the switch-lever M is connected, through the medium of crank-levers Q R and rods *q q'*, with the switch-rails. A third lever, L', is connected with the slide E of a second box, B, supporting slides connected to signals S S'.
35 When the switch-lever M is vibrated so as to throw the switch-rails fully to one position or the other, the movement of the rails is transmitted to the carrier-bar D, and the head of the latter is brought into engagement with one
40 or the other of the signal-bars, and the signal-lever L may then be moved so as to carry with it the signal-bar with which the slide E is engaged, the other being locked. The parts are so arranged and connected that the shifting of
45 the switch-rails will always bring the slide E into connection with the signal-bar that operates the signal of the track which is opened or completed by the movement of the switch, so that the said signal, which is normally at
50 "danger," may be set to "safety," and it will be seen that when the slide E has been thrown inward to set the said signal at "safety" the switch-rails will be thereby locked in their position, inasmuch as the said slide is carried
55 between the parallel bearings formed by the side rib, *b* or *b'*, and the middle rib, *c*, and cannot be moved laterally, thereby preventing any movement of the carrying-bar D so long as the slide is in this position. Thus when
60 the slide E has been carried to the position shown in Fig. 4 on the opening or completing of the branch line, and on the setting of the signal J thereof in position indicating "safety," it will be between the ribs *b c*, and will hold
65 the carrying-bar D, and the switch-rails connected therewith, securely in position; but when the slide is drawn outward until its head

can pass the end of the rib *c* it can be moved freely with the carrier-bar D, when the latter is shifted by the shifting of the switch-rails, or
70 any parts connected therewith.

Should the switch-rails be set to a mid-position, it will be impossible to alter either signal from "danger" to "safety," inasmuch as
75 any attempt to then move the slide E will be resisted by the contact of the head of the slide with the end of the rib or bearing *c*, the resistance to the movement of the signal thus indicating to the attendant in the cabin that
80 the switch-rails are out of position, while both tracks are blocked by the danger-signal, and both signals are locked so that they cannot be altered.

The bars A A' may in some instances be arranged close together, instead of being separated by the block *d*, in which case the locking device prevents the movement of both bars
85 until the slide is fully connected to move either one or the other. In such case, also, the slide takes its lateral bearings against the side rib, *b* or *b'*, and the side of the locked bar.

While the device described is thus effective in locking both signals and the switch-rails at the proper times, and in transmitting motion
90 to the signals to be operated when the parts are all in proper position, it is extremely simple in its construction, consisting of parts which operate positively without lost motion or liability to become impaired or inoperative from
95 wear, and not liable to be effected injuriously by the conditions under which it must be used.

It is not necessary to construct all the parts of the device in the manner above described. For instance, the slide E and the signal-bars
100 may be differently constructed, so as to secure a temporary connection of the slide with each bar when the slide is brought against such bar. Thus the slide may have recesses to receive pins upon the bars. Nor is it necessary
105 to use a locking device constructed precisely as shown. For instance, the locking device may consist of a rocking lock bar or bolt, *f'*, Figs. 7 and 8, with turned-up ends adapted to
110 bearings on both signal-bars, and the connections between the bolt and the signal-bar operating devices may be a rock-shaft, *s*, carrying a cross-head, *t*, with turned-up ends, with
115 which a lug, *r'*, on the shifting-bar D makes contact as the slide is brought into connection with either signal-bar, thus rocking the bolt
120 away from its bearing on that bar.

The connections with the lock or bolt may be operated by the movement of any part of the signal-bar operating mechanism—as, for
125 instance, the slide—and different connections than those described may be used between the slide and the switch-rails or any part of the switch-operating devices.

Without limiting myself to the precise construction and arrangement of parts shown, I
130 claim—

1. A signal-operating device consisting of two or more guided bars, a laterally and horizontally movable slide constructed to make

connection with each bar independently, and means for shifting the slide laterally, and a locking device independent of the slide, whereby both bars are locked immovably until the slide is in connection with one or the other of the bars, substantially as described.

2. The combination, with the signal-bars and laterally and horizontally moving slide and shifting device, of a locking device independent of the slide, and connections between the same and the slide or shifting device, whereby the locking device is withdrawn on the shifting of the slide from each bar as the slide is brought into connection therewith, substantially as described.

3. The combination of the signal-bars, the center and side ribs extending longitudinally, and the sliding and shifting slide connected with the switch devices and adapted to make connection with either bar and to fit between each side rib and the center rib when thrown inward to set the signal, substantially as and for the purpose set forth.

4. The combination of the sliding signal-bars, shifting slide adapted to slide with each bar between parallel bearings, and a locking device for securing both bars, and a lever extending between the locking device and the slide or shifting bar, connected to move the lock to unlock only the signal-bar to which the slide is connected, substantially as described.

5. The combination of the parallel notched signal-bars, independent bolt arranged between to lock both bars immovably, and connections between the bolt and the bar-operating

devices, whereby the bolt is withdrawn only from the notch of the bar in connection with such operating devices, substantially as described.

6. The combination of the signal-bars, sliding bolt, shifting slide, and lever connected to the bolt and to the slide-shifting devices, substantially as described.

7. The combination of the signal-bars, bolt, slide, slide-carrying bar, and lever connected to the bolt and slide-carrying bar, substantially as described.

8. The box, the signal-bars guided therein, the rib *c*, extending between the bars, the slide and slide-carrying bar sliding transversely of the box, the bolt *f*, and lever *I*, all substantially as described.

9. The combination, with the main and branch tracks and switch-bars and signals of a railway, of a signal-lever, switch-lever, signal-bars each connected to operate one of the signals, slide connected to the signal-lever and adapted to make connection with each bar, slide-shifting devices connected with the switch devices, an independent locking device for securing both bars, and connections between the lock and the signal-bar-operating devices, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAVUS N. REIFF.

Witnesses:

EDWARD H. JOHNSTON,
HAROLD E. COBB.