

(No Model.)

3 Sheets—Sheet 1.

J. B. SUTHERLAND.

TRACK INSTRUMENT FOR RAILROAD SIGNALS.

No. 390,993.

Patented Oct. 9, 1888.

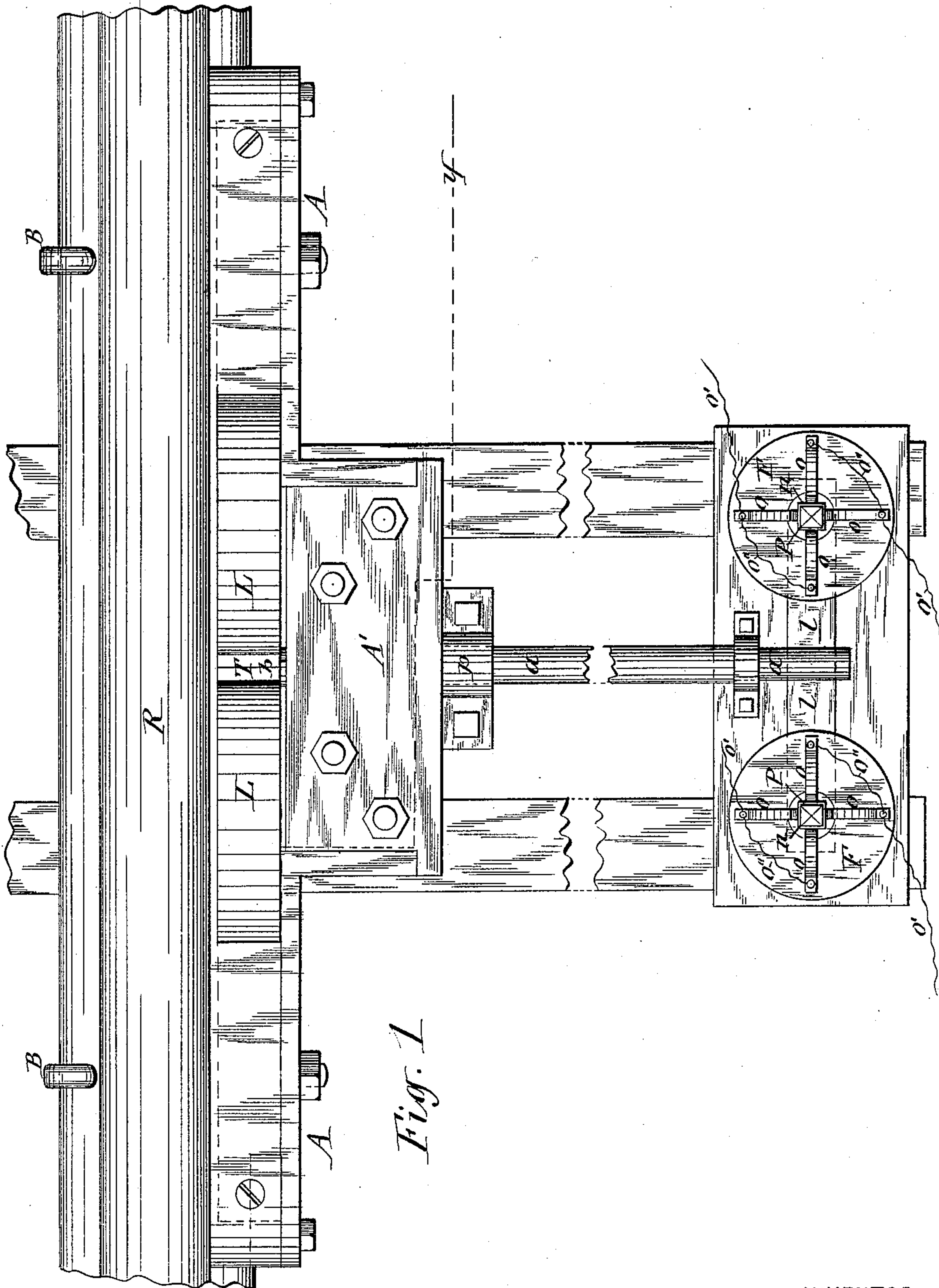


Fig. 1

WITNESSES:

C. L. Bendixon,
J. J. Lass.

INVENTOR.

John B. Sutherland.

BY

Shull, Laess & Shull.

ATTORNEYS.

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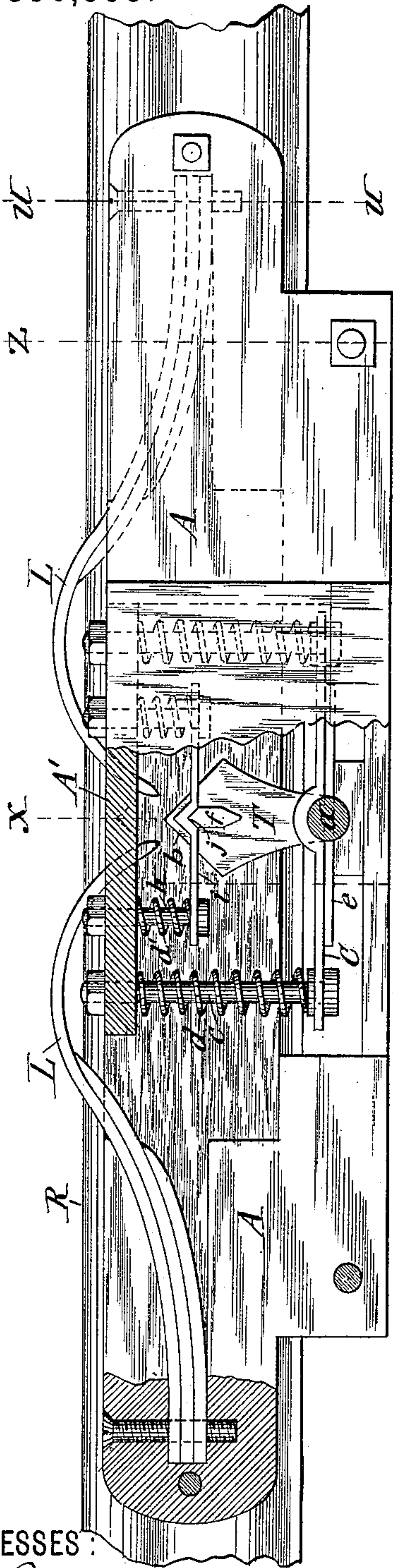


Fig. 2 x

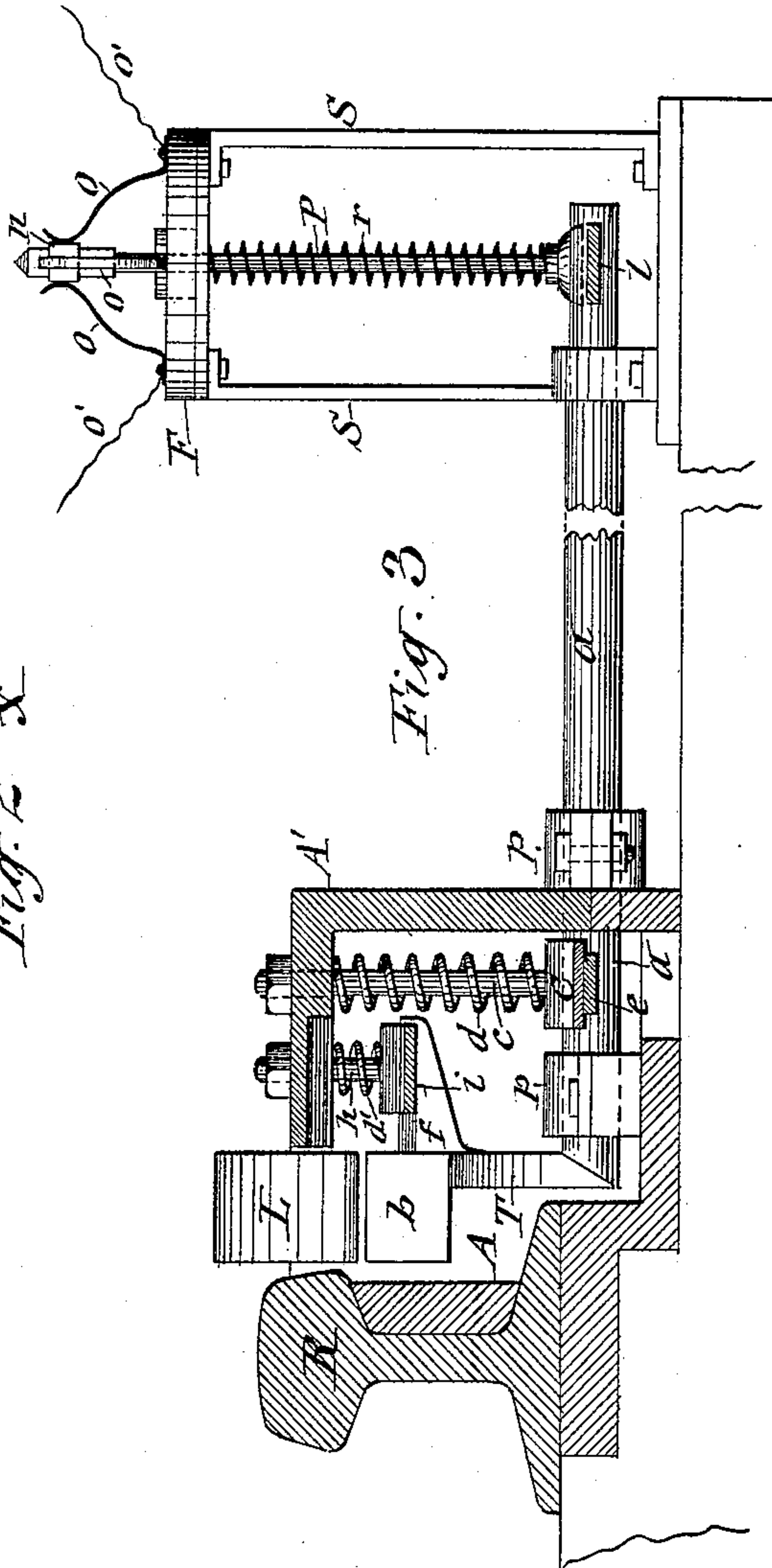


Fig. 3

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(No Model.)

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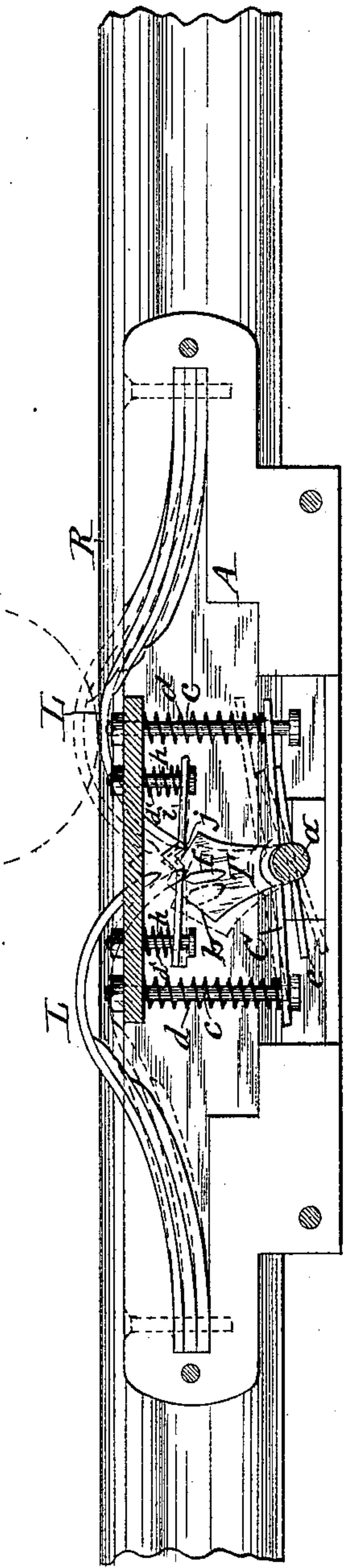


Fig. 6

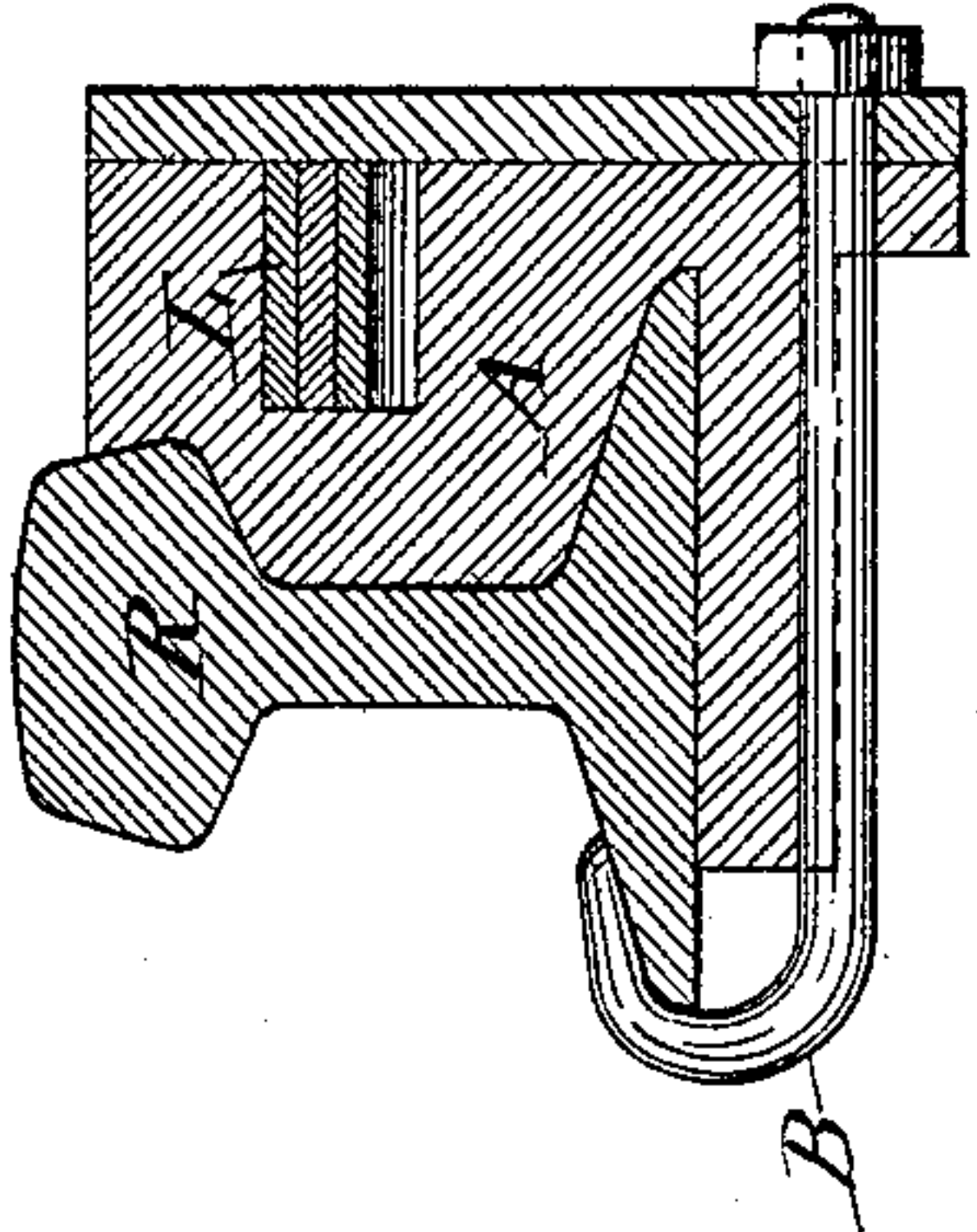


Fig. 4

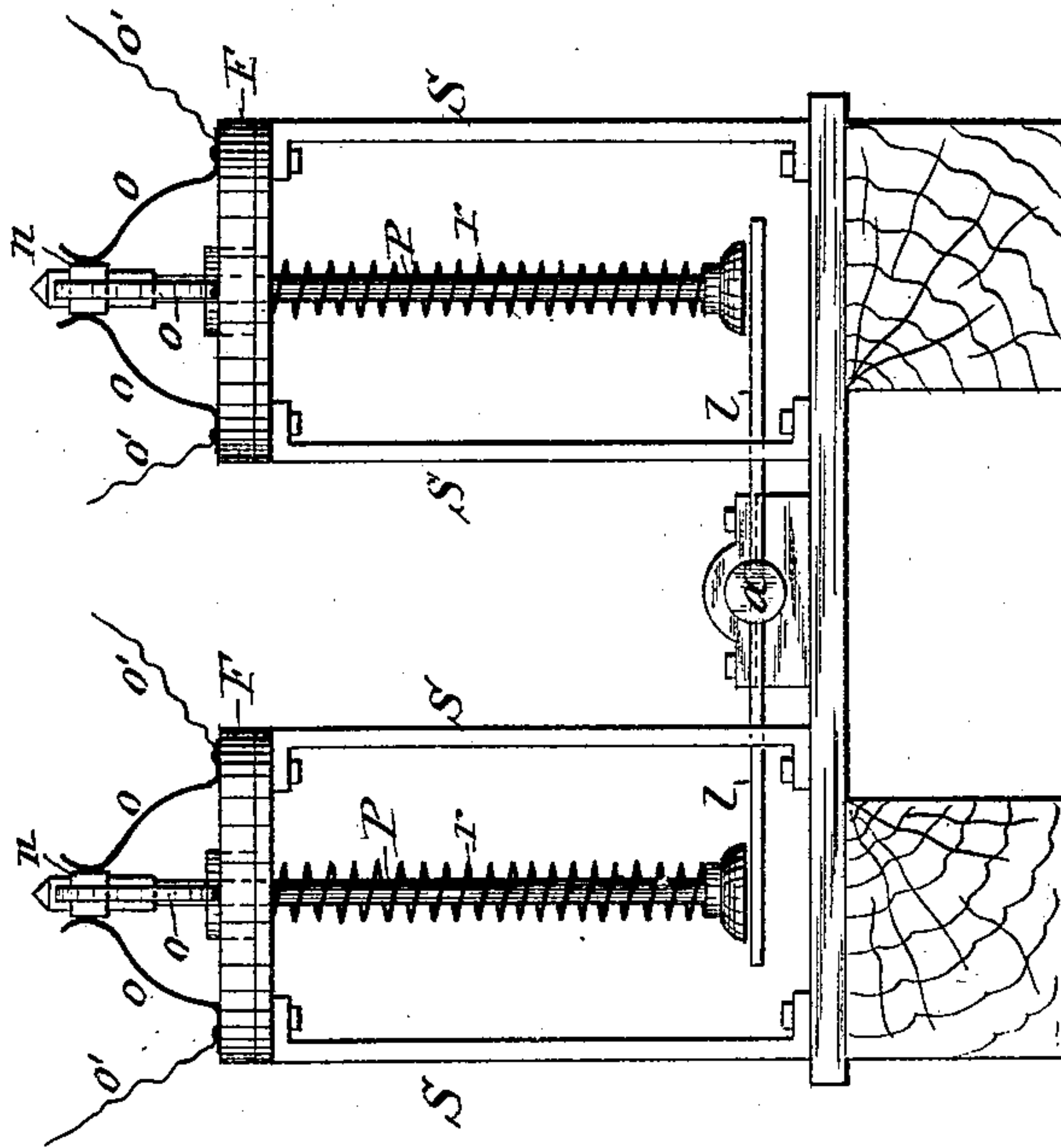


Fig. 7

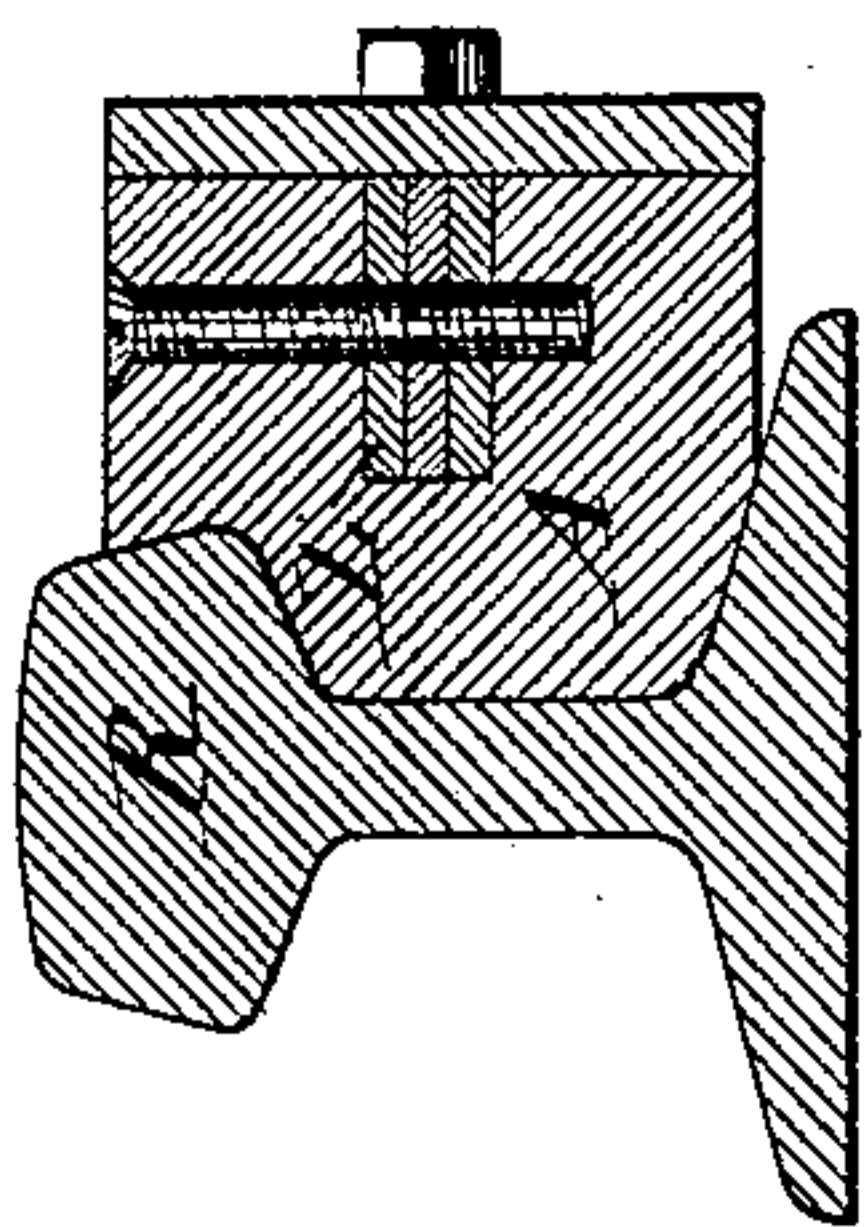


Fig. 5

WITNESSES:

C. L. Bendixon.
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UNITED STATES PATENT OFFICE.

JOHN B. SUTHERLAND, OF SYRACUSE, NEW YORK, ASSIGNOR TO CHARLES E. HUBBELL, OF SAME PLACE.

TRACK-INSTRUMENT FOR RAILROAD-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 390,993, dated October 9, 1888.

Application filed November 28, 1887. Serial No. 256,384. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. SUTHERLAND, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Track-Instruments for Railroad Signals, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel construction of a track-instrument and devices connected therewith by means of which the number of cars in each train passing over certain sections of railroad can be automatically and positively signaled or registered, said instrument being especially well adapted for operating the registering or signaling apparatus for which J. Harper Gibson filed an application for United States Patent, Serial No. 241,463, dated June 16, 1887.

The invention is fully illustrated in the annexed drawings, in which—

Figure 1 is a top plan view of a track-instrument embodying my improvements. Fig. 2 is a vertical longitudinal section on line *yy*, Fig. 1. Figs. 3, 4, and 5 are vertical transverse sections, respectively, on lines *xx*, *zz*, and *uu*, Fig. 2. Fig. 6 is a side elevation of the track-instrument minus its covering-plate, showing said instrument in its two operative positions; and Fig. 7 is a side elevation of the circuit-breaking devices.

Similar letters of reference indicate corresponding parts.

R represents one of the rails of a railway-track, to the outer side of which rail I firmly secure a frame, A, preferably by grip-hooks B, connected at one end to said frame and extending across the under side of the rail and gripping the base thereof at the opposite side, as shown in Fig. 4 of the drawings. This frame A is extended lengthwise the rail R, and to the ends thereof are firmly secured the ends of two spring-levers, L, which lie close to the outer side of the rail and parallel therewith and with their free ends toward each other. Said free ends of the spring-levers are deflected downward for the purpose hereinafter explained, and the intermediate or main portions of said levers project above the rail, so as to receive the downward pressure of the

car-wheels passing over them, as indicated by dotted lines in Fig. 6 of the drawings.

a denotes a horizontal shaft arranged at right angles to the rail and in a line intersected by a vertical line drawn from a point midway between the free ends of the spring-levers L L. Said shaft is journaled in suitable boxes or bearings, *pp*, secured to a case or an enlargement, A', of the frame A, and to this shaft is rigidly attached a tumbler, T, which is formed with a head, *b*, sloped downward from the center in opposite directions and under the free ends of the levers L L. Said tumbler is sustained with the center of its head normally midway between the free ends of the levers by means of a bar, *e*, which is rigidly attached to the shaft *a* and projects from opposite sides thereof at right angles to a line drawn from the center of the shaft through the center of head *b* of the tumbler, said bar lying against the under side of or otherwise suitably engaging with a yoke, C, extended across the top of the shaft and supported at its ends on the heads of bolts or vertical guide-rods *cc*, pendent from the top of the frame or case A', as shown in Figs. 2 and 6 of the drawings. The yoke is allowed to slide vertically on said guide-rods; but said movement is in a measure resisted by spiral springs surrounding the guide-rods and pressing on the yoke.

The operation of the apparatus thus far described is as follows: A car-wheel passing over the levers L L first depresses one of said levers and causes the free end thereof to strike the adjacent sloping side of the tumbler-head *b*, and thereby crowd the tumbler T toward the free end of the other lever, as shown by full lines in Fig. 6 of the drawings. The wheel next depressing the second lever L causes the free end thereof to strike the same side of the partly-tilted tumbler-head *b*, but nearer the top of said head from where the first lever leaves it, and consequently the second lever tilts the tumbler T still farther in the same direction, as represented by dotted lines in Fig. 6 of the drawings. This engagement of both levers with the tumbler in one and the same direction insures a positive action of the tumbler, which is one of the essential features of my invention.

The described action of the tumbler is to a certain degree resisted by the pressure of the springs d d upon the yoke C, and during said action the bar e , which projects from the shaft a , and consequently tilts with the tumbler, pries up one end of the yoke. As soon as the car-wheel releases the second lever L, the latter automatically rises and releases the tumbler T, which is then restored to its normal position by the pressure of the spring-restrained yoke C upon the bar e . In order to insure more positively the central position of the tumbler-head b between the free ends of the levers L L when at rest, I provide the tumbler T with a rigid laterally-projecting lug, f , and place across the top of said lug a bar, i , which is supported at its ends on the heads on the lower ends of bolts or guide-rods h h , dependent from the top of the case or frame A', and is adapted to slide vertically on said guide-rods. The center of the bar i is provided with a notch, j , which the lug f enters when the tumbler is at rest or in its normal position, as shown in Fig. 2 of the drawings. Springs d' d' , pressing down on the bar i , cause said bar to partially lock the tumbler in its normal position by the aforesaid engagement of the lug f with the notch j .

The movement of the shaft a received from the tumbler T, I utilize to actuate an electric circuit breaker or maker, as may be desired, and this I accomplish chiefly by means of arms l l , which are rigidly attached to and project laterally in opposite directions, preferably horizontally therefrom. The circuit breaker or maker may be of any suitable and well-known form.

For exemplification of my invention I have selected a circuit-breaker constructed similar to the apparatus shown and described in the patent to J. H. Gibson, No. 351,319, dated October 19, 1886. It consists of two plungers, P P, one over each arm l at the free end thereof and guided vertically through an insulating-head, F, supported upon standards S S. The plungers are suspended from the head F, so that when the shaft a is at rest the feet of the plungers stand either upon or barely clear of the arms l l , as shown in Fig. 7 of the drawings. Springs r , surrounding the plungers and pressing with opposite ends against the under side of the head F and feet of the plungers, partially restrain the plungers from rising. The upper ends of the plungers are provided with insulated metallic heads n , and against each of said heads bear the free ends of two sets of metallic spring-arms, o o , which latter are maintained separated from each other by the interposition of the plunger, and are secured at their feet to the insulated head F. The arms o o are connected in sets or pairs by wires o'' o'' , and from each set is extended one of the wires o' of an electric circuit. By employing two arms o for each wire o' , I insure the making of the circuit through the metallic head n of the plunger. The tilting of the tumbler T by the depression of the levers L L turns

the shaft a , and causes one of the arms l to rise and lift one of the plungers P sufficiently to carry the metallic head n of said plunger above the ends of the arms o o so as to break the circuit. As soon as the levers L L release the tumbler and allow the same to resume its normal position on the shaft a , the arms l l are carried back to their normal position, and the plunger P is depressed by the spring r , so as to bring the arms o o in contact with the metallic head n of the plunger, and thus the circuit is again closed. It will be observed that by means of the described track-instrument and circuit-breakers connected therewith each wheel passing over the levers L L produces a separate and distinct electric impulse, which can be utilized to register or signal the passage of each wheel.

Inasmuch as the tumbler T changes the direction of its movement according to the direction of the movement of the wheels on the track and the arms l l move synchronously with the tumbler, it is obvious that the passage of the wheels in one direction causes one plunger P to be actuated and the passage of the wheels in the opposite direction, causes the other plunger to be actuated; hence by connecting the circuit-breakers of each plunger with a separate circuit and connecting with each circuit a suitable registering or signaling instrument not only the number of wheels but also the direction of the wheels can be registered or signaled.

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

1. In combination with a railway-rail, levers lying parallel with said rail and with their free ends toward each other curved downward at said ends and rising with their intermediate portions above the rail, and a tumbler having a head sloping downward from the center in opposite directions and sustained normally with the center of said head between the free ends of the levers, substantially as set forth.

2. In combination with a railway-rail, a tumbler arranged movable in a plane parallel with the rail and provided with a head sloped from the center in opposite directions, and levers projecting above the rail and adapted to engage successively one and the same sloping side of the head of the tumbler, substantially as and for the purpose specified.

3. In combination with a railway-rail, the spring-levers L L, lying with their free ends toward each other and deflected downward thereat, and having their intermediate portions projecting above the rail, the horizontal shaft a at right angles to the rail and in a line intersected by a vertical line drawn from a point midway between the free ends of the spring-levers, the tumbler T, rising from said shaft and formed with the head b , sloped from the center in opposite directions and under the free ends of the levers, and springs supporting the tumbler with the center of its head normally midway between the free ends of the

spring-levers L L, substantially as shown and set forth.

4. In combination with a railway-rail and frame A A', the levers L L, lying with their free ends toward each other and deflected downward thereat, the shaft *a*, tumbler T, rising from said shaft and formed with the sloping head *b*, the yoke C, guide-rods *c c*, supporting the said yoke, springs *d d*, bearing on the yoke, and the bar *e*, projecting from opposite sides of the shaft *a* and held by the yoke C, substantially as and for the purpose set forth.

5. In combination with a railway-rail and frame A A', the levers L L, lying with their free ends toward each other and deflected downward thereat, the shaft *a*, tumbler T, rising from said shaft and formed with the sloping head *b*, the yoke C, guide-rods *c c*, supporting said yoke, springs *d d*, bearing on the yoke, the bar *e*, projecting from the shaft *a* and held by the yoke, the lug *f*, projecting from the tumbler, guide-rods *h h*, the bar *i*, sliding vertically on said guide-rods, and provided with the notch *j*, engaging the lug, and springs *d'*, bearing on the bar *i*, substantially as described and shown.

6. In combination with the rail R, levers L L, shaft *a*, and the tumbler T, projecting from said shaft and sustained normally with its head between the free ends of the levers, the arms *l l*, projecting from the shaft, and electric circuit-breakers actuated by said arms, as set forth.

7. In combination with the rail R, levers L L, shaft *a*, and the tumbler T, projecting from said shaft and sustained normally with its head between the free ends of the levers, the arms *l l*, projecting from the shaft, the plungers P P, supported above the free ends of the arms, insulated metallic heads *n* on said plungers, metallic arms *o o*, resting against said heads, and electric wires *o' o'*, extending from the arms *o o*, substantially as described and shown.

In testimony whereof I have hereunto signed my name, in the presence of two witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 23d day of November, 1887.

JOHN B. SUTHERLAND. [L. S.]

Witnesses:

WILLIAM WALLACE,
MARK W. DEWEY.