

J. J. JAGOLIN.
TROLLEY POLE GUIDING AND FINDING DEVICE.
APPLICATION FILED MAR. 7, 1908.

924,784.

Patented June 15, 1909.

3 SHEETS—SHEET 1.

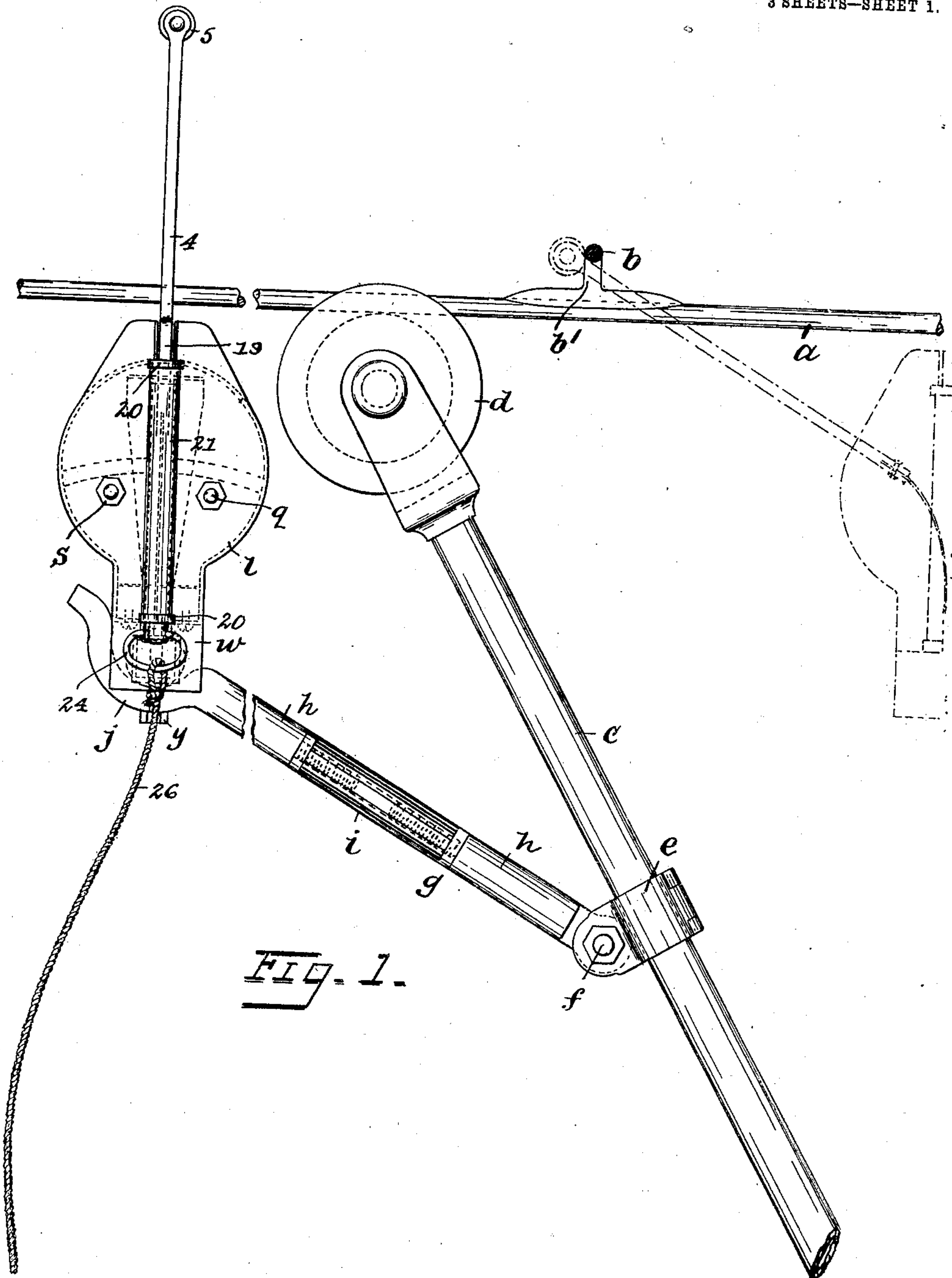


FIG. 1.

WITNESSES

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BY

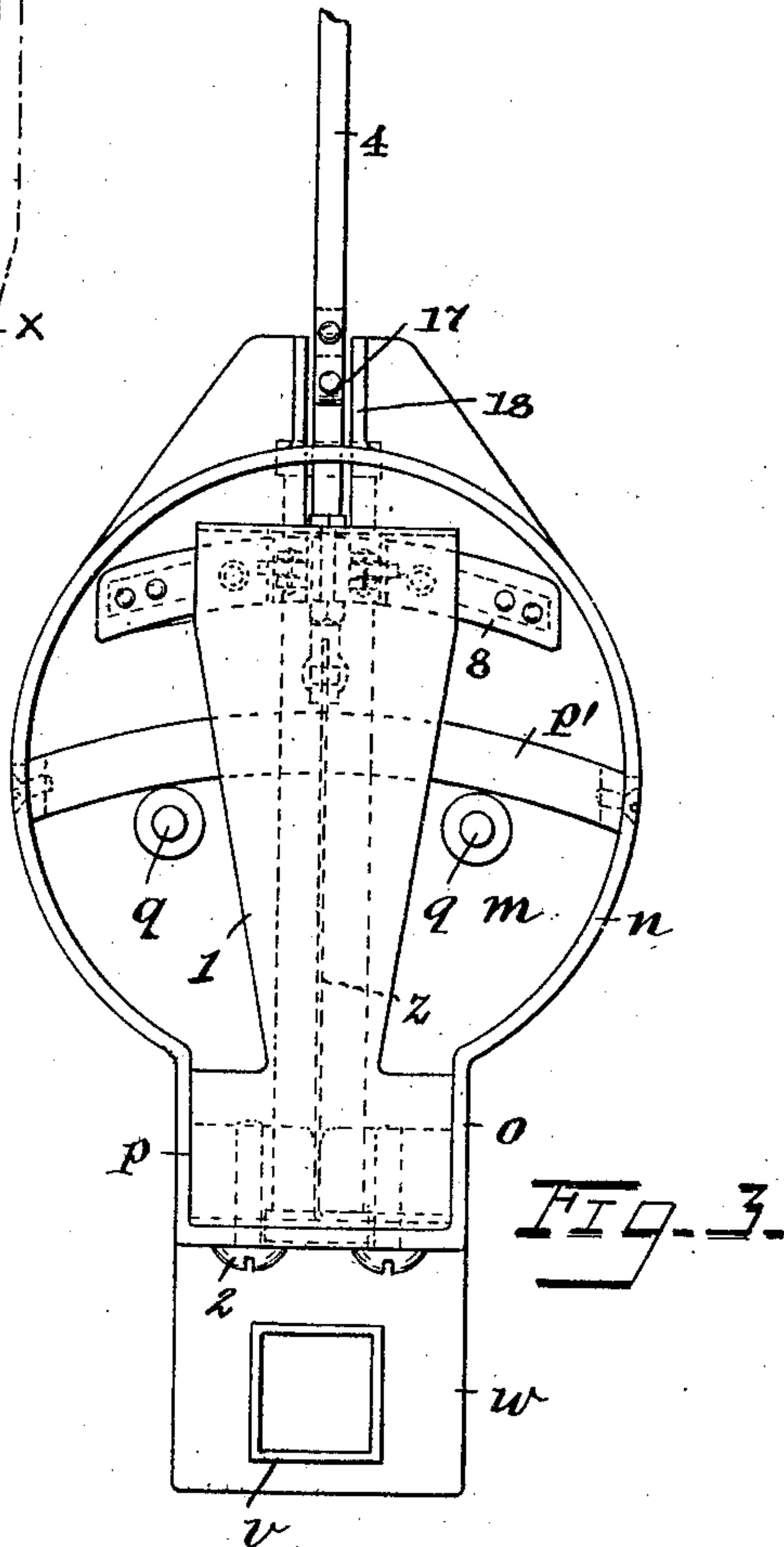
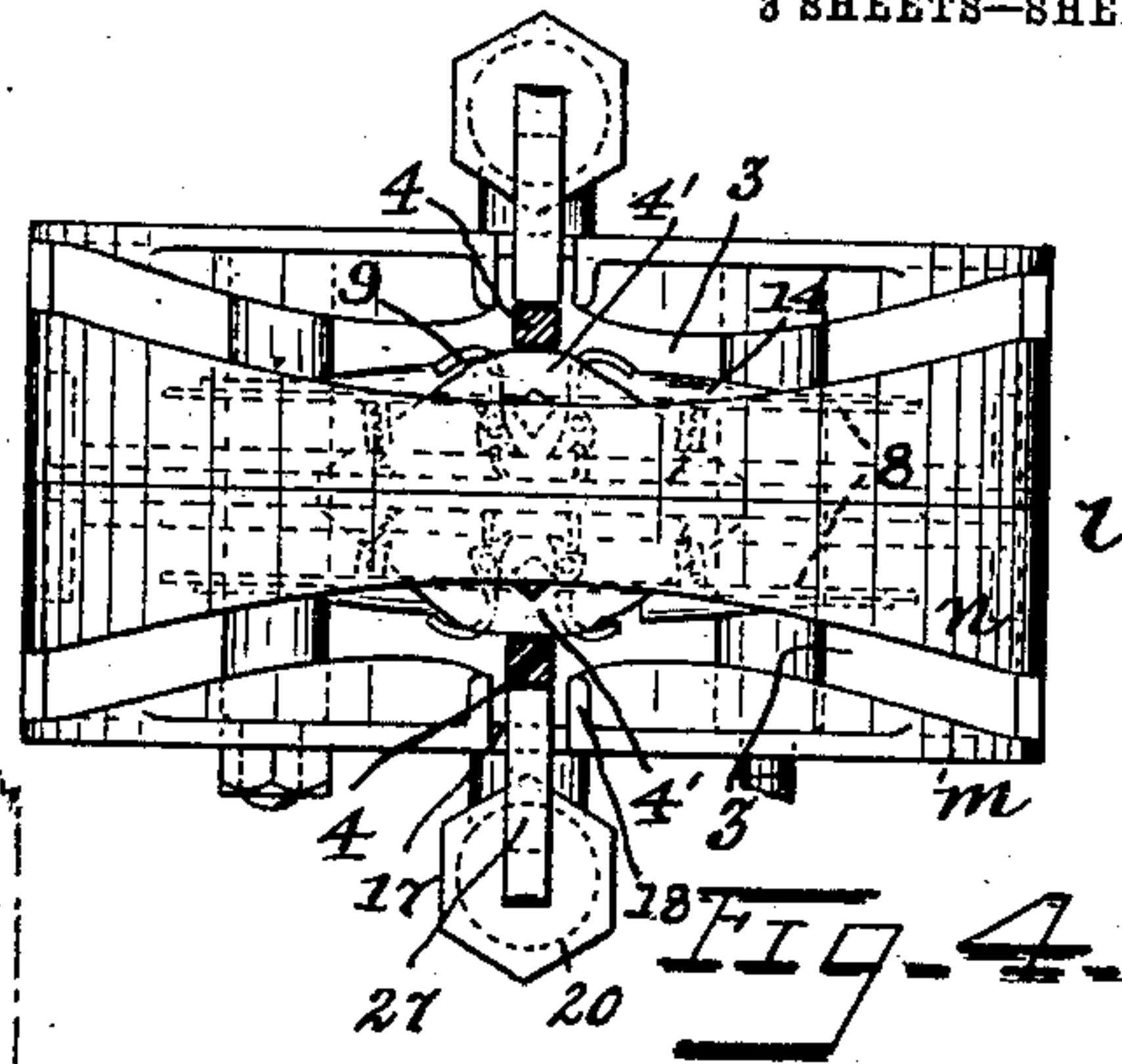
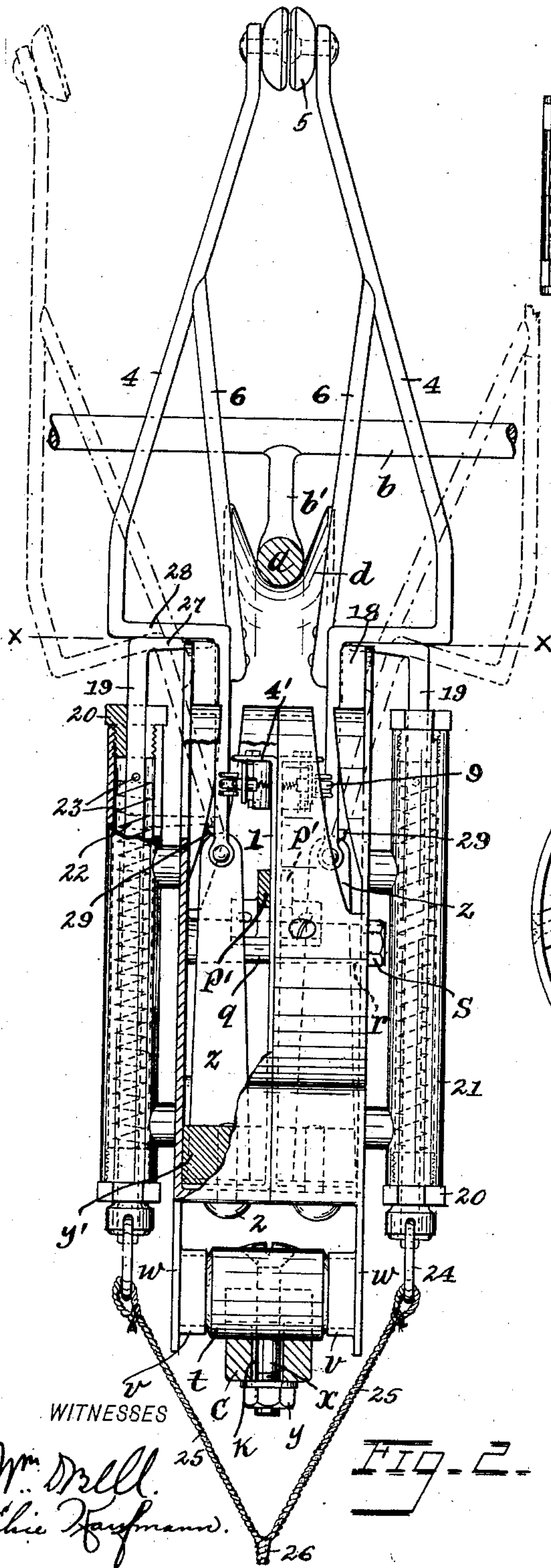
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3 SHEETS—SHEET 2.



WITNESSES
Wm. Drell.
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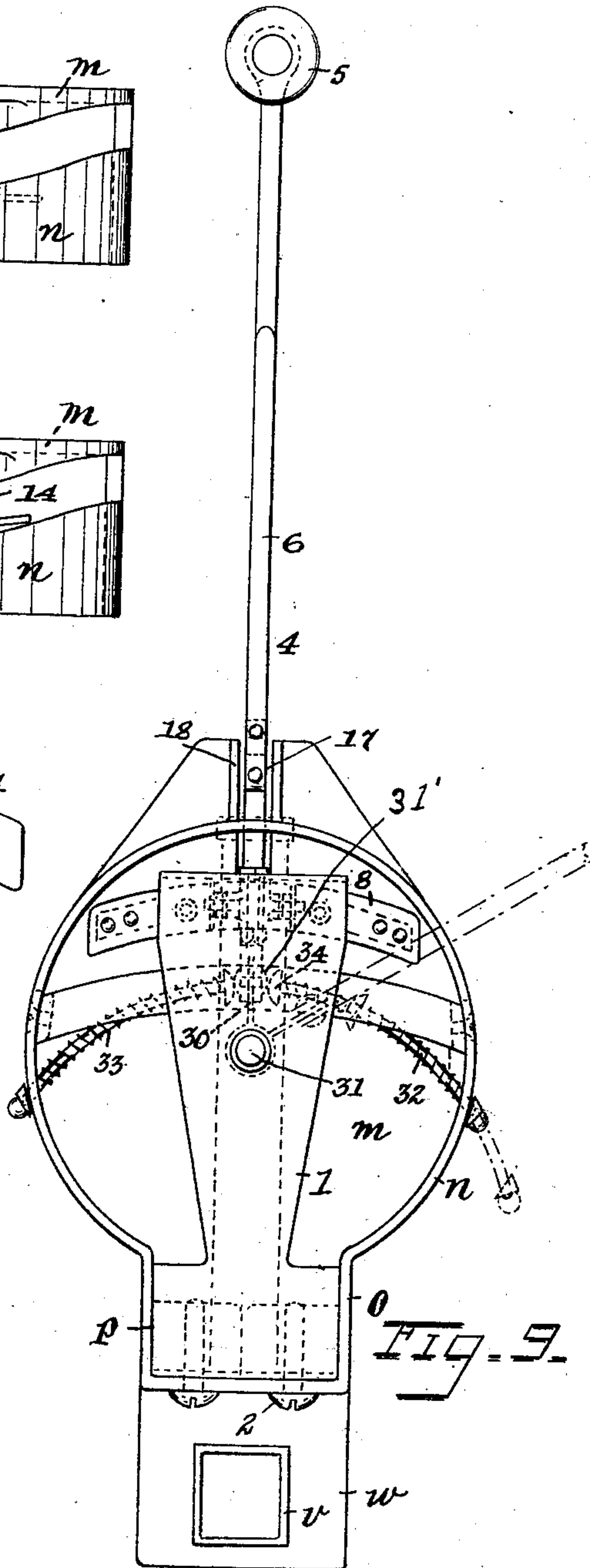
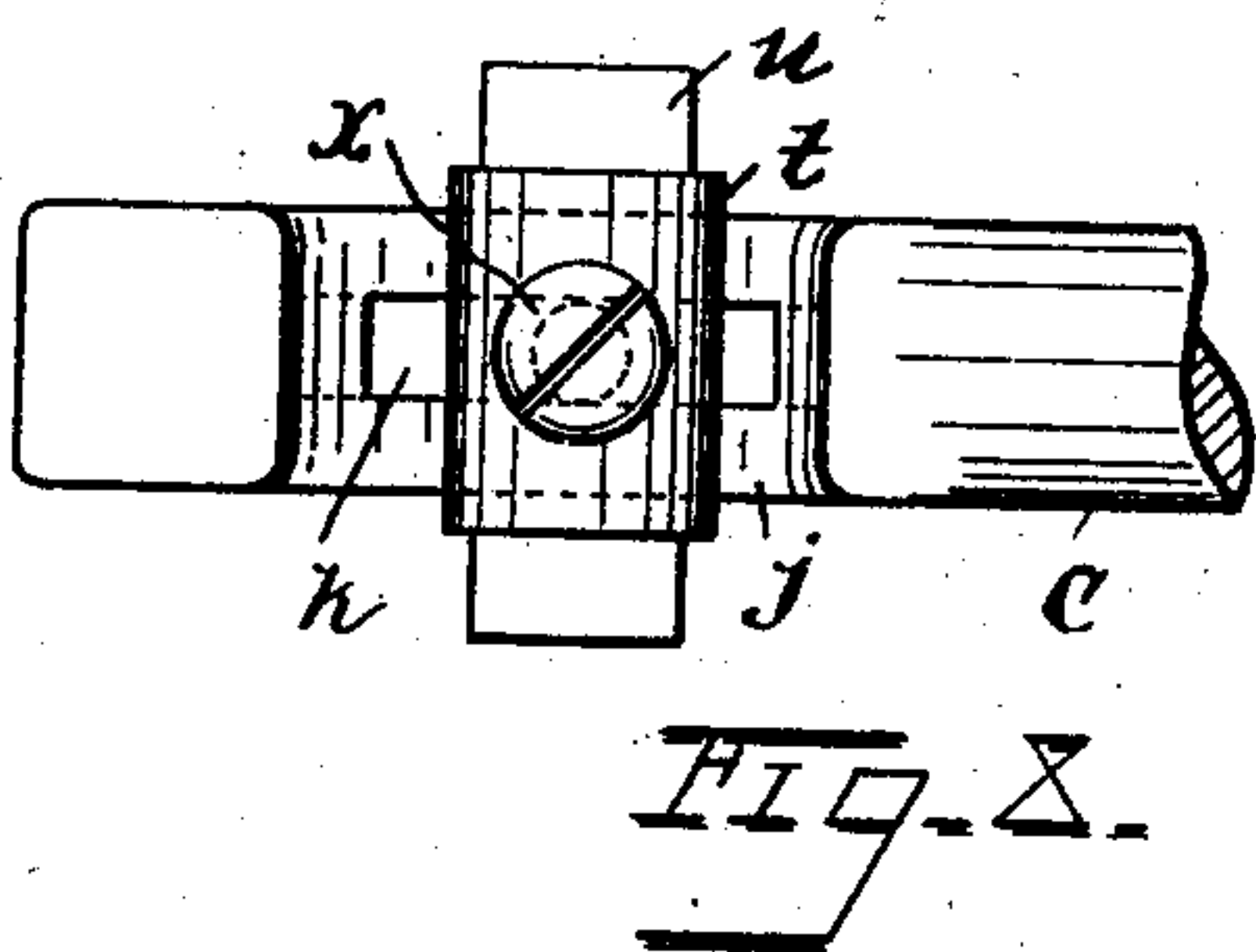
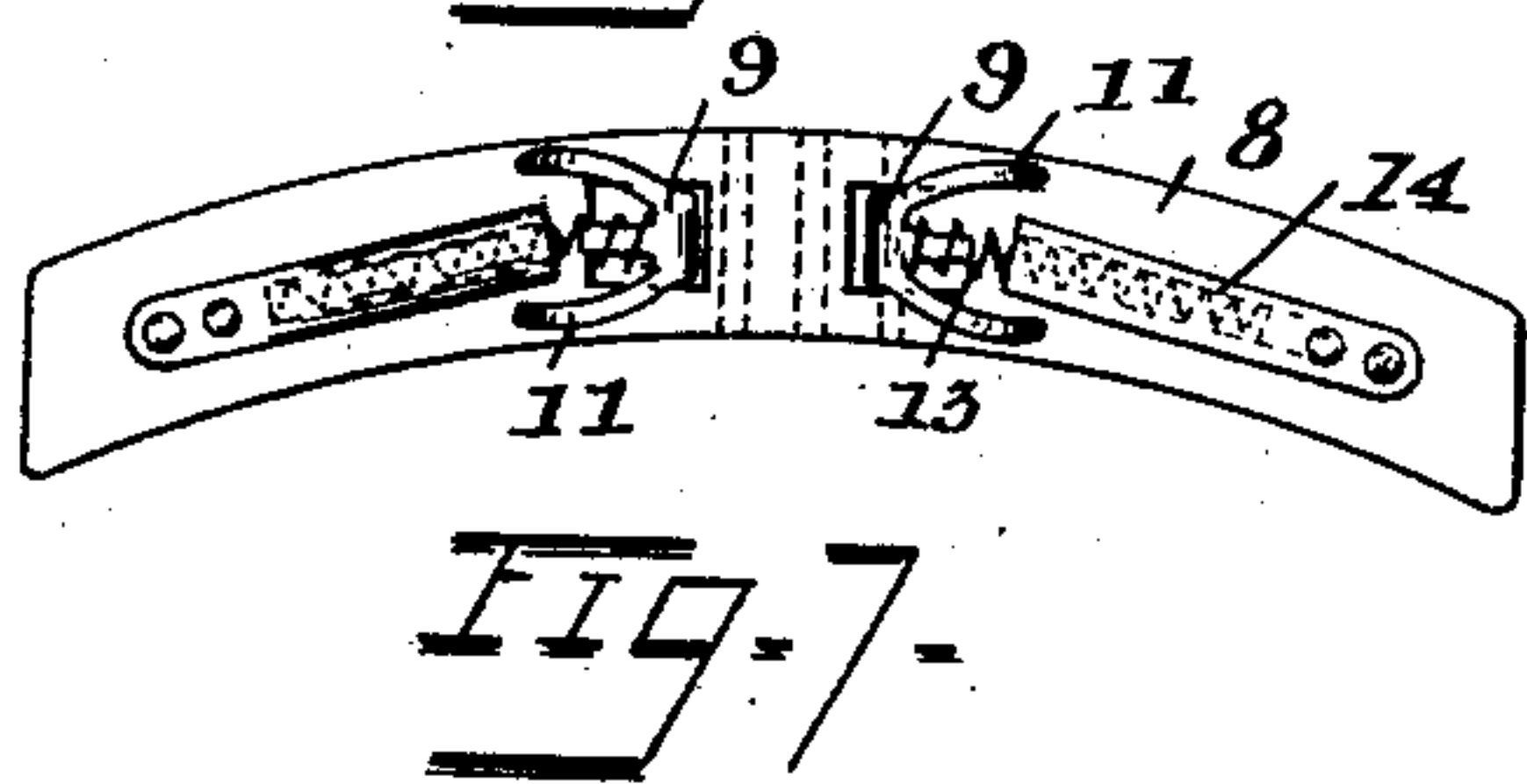
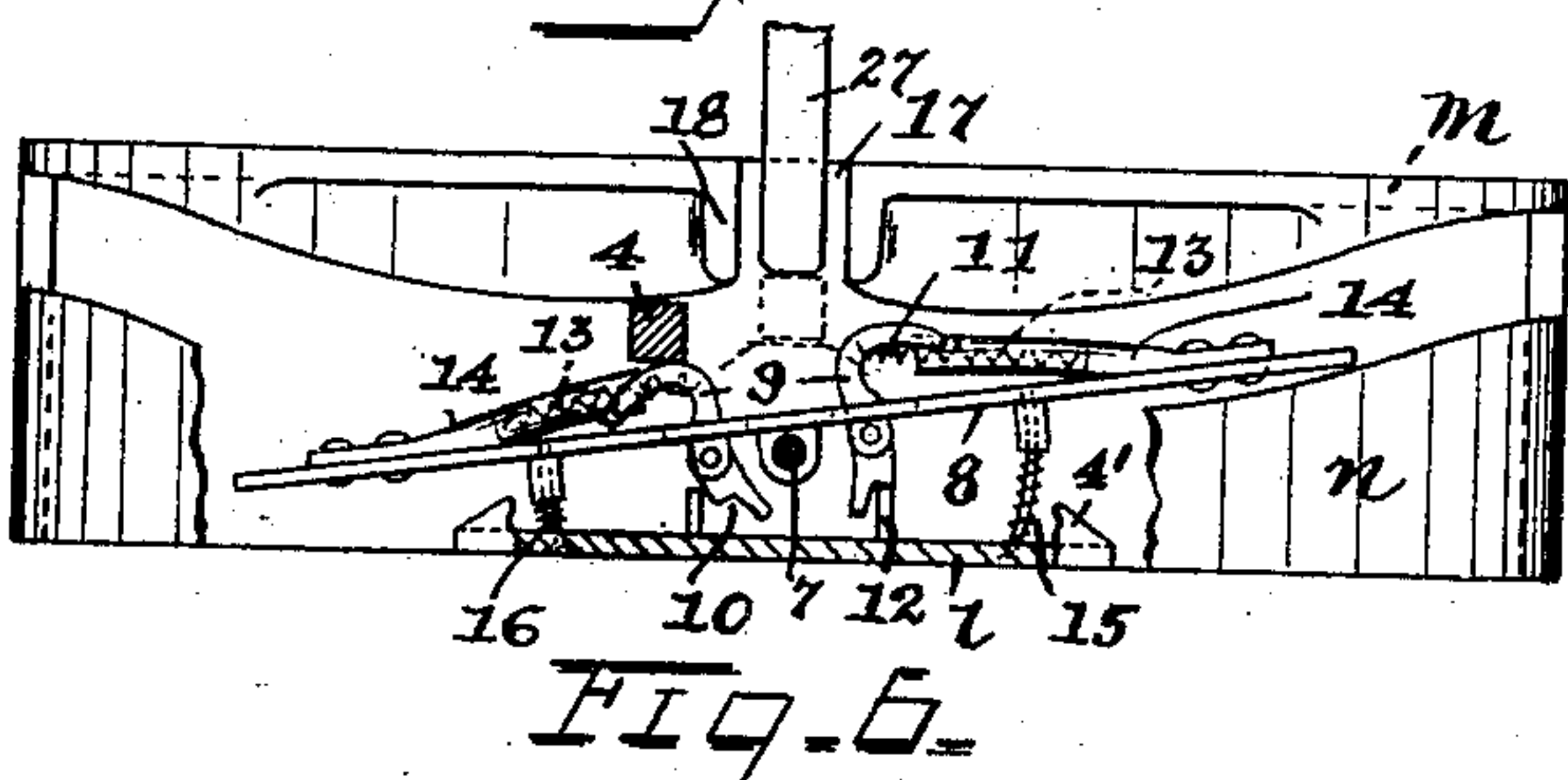
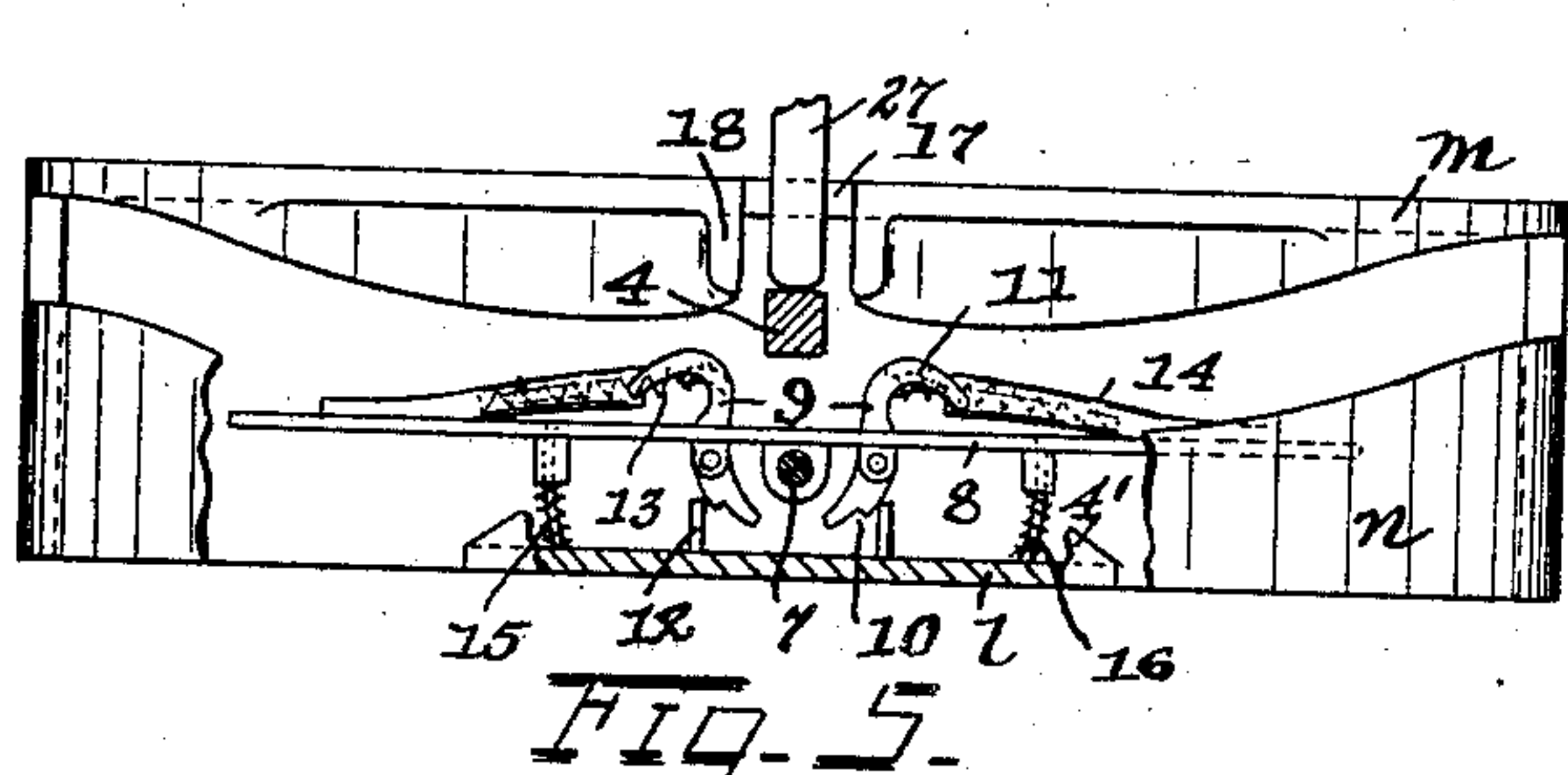
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES J. JAGOLIN, OF PATERSON, NEW JERSEY.

TROLLEY-POLE GUIDING AND FINDING DEVICE.

No. 924,784.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed March 7, 1908. Serial No. 419,787.

To all whom it may concern:

Be it known that I, JAMES J. JAGOLIN, a citizen of the United States, residing in Paterson, Passaic county, New Jersey, have
5 invented a certain new and useful Improvement in Trolley-Pole Guiding and Finding Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others
10 skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

15 The object of this invention is to provide an improved means for insuring the proper contact at all times when in service of the wheel of a trolley pole with the wire and for facilitating the finding of the wire by the
20 wheel, which means shall be reliable in operation, capable of being readily applied to any trolley pole already in use, permit the car to be moved backward as well as forward and still retain the device effectively operative,
25 and adapted to be caused to release the wire so that the pole may be reversed when occasion requires.

My invention will be found fully illustrated in the accompanying drawings, wherein,

30 Figure 1 is a side elevation of a trolley pole showing the device applied thereto; Fig. 2 is a front elevation of what is shown in Fig. 1, the parts being slightly enlarged and certain portions appearing in section and others broken away; Fig. 3 is a view in elevation of one part of the casing of the device; Fig. 4
35 is a horizontal sectional view on the line $x-x$ of Fig. 2; Fig. 5 is a plan view of one section of the casing and of certain parts of the mechanism inclosed thereby, some of which appear in section and others broken
40 away; Fig. 6 is a view similar to Fig. 5 showing the parts in an altered position; Fig. 7 is a view in side elevation of certain parts shown in Figs. 5 and 6, detached; Fig. 8 is a detail view showing the manner in which the
45 device is partly adjusted to the proper position with reference to the trolley wire; and, Fig. 9 is a view similar to Fig. 3 of another
50 form in which the part of the device shown in Fig. 3 may be made.

In said drawings, a designates the trolley wire and b the usual cross-wire for supporting

the same; c is the trolley pole and d its wheel adapted to run on the wire a in the usual
55 manner.

A hinged clamp e having the bolt f is secured to the pole c , this clamp acting to support at any required height an arm g comprising the metallic sections h and the
60 intermediate insulative section i , the latter having threaded studs of the sections h screwed into it so that the several sections are substantially united in alined arrangement. The section h at the end of the arm
65 is formed with a downwardly bending end portion j having a longitudinal slot k and affording a means for adjustably supporting on the arm certain parts now to be described.
70

l designates a casing made in two substantially similar hollow sections or members; each section of the casing comprises the flat outer wall m and the wall n formed for the
75 most part circular, or substantially so, except for its portion o which produces an extension or socket p at the base of the main cavity, such socket being substantially rectangular. One of the sections has the studs
80 q projecting from it toward the other, the reduced threaded ends of said studs being adapted to pass through apertures r in the wall m of the other section and to receive nuts
85 s which hold the two sections together. The sections are further held in proper relation to each other by the post t having squared ends
 u which fit into opposed square sockets v formed on the downwardly extending portions
90 w of the walls m ; this post is penetrated by the bolt x which extends through the slot k of the curved end of arm g and carries the nut y , whereby the casing may be adjusted to various angles relatively to the
95 arm g . It will be apparent that the proper disposition of the casing, as hereinafter indicated, relatively to the wire and the pole may be secured by means of the adjustable
connections between the pole and the arm and the arm and the casing.

In each socket p is arranged a pair of
100 blocks y' , such pairs of blocks, as well as the blocks in each pair, standing close together; between the blocks of each pair is secured an upwardly extending elastic blade z , flexible
105 in the direction of the length of the trolley wire, and between the two pairs of blocks

when the sections of the casing are properly assembled extend the lower portions of the flat upright brackets 1 which stand face to face and have their upper ends bent off at right angles in opposite directions and their lower ends correspondingly formed, the bent-off portions at their lower ends being projected under the blocks. The blocks, blades and brackets are held in place by the rivets or the like 2 penetrating the bottom walls of the sockets p and the blocks, as well as the bent-off lower ends of the brackets; in order to brace the upper portions of the brackets I provide two arc-shaped bridge pieces p' which are riveted at their ends to the walls n of the casing sections and which lie closely against the opposite sides of the brackets. Each of the curved walls n of the casing has at the top an arc-shaped cam slot 3, the two slots being so arranged as to approach nearest to each other at the top of the casing. Through these slots project the shanks of the trolley retaining fingers 4, each finger is thus capable of movement with the blade backward and forward and, owing to its pivotal connection with the blade, laterally thereof. In its backward and forward movements each finger is guided by the cam slot 3, the slots operating to bring the fingers together when they stand upright, and to force them apart (see dotted outline in Fig. 2) when the blades yield backward or forward. Thus, the fingers being in retaining position with reference to the wire a , when they come in contact with the cross wire b they yield in the direction of the length of wire a , owing to the flexibility of the blades, and at the same time they open or move apart under the action of the cam slots 3, so that the rollers 5, which the ends of the fingers carry and which normally bear against each other, will clear the suspender b' of the cross wire. It will thus be seen that the fingers are automatically held in such position that the trolley wire is kept always within their control, and thus the trolley wheel d is prevented from running off the wire; at the same time they automatically yield, whether the car is moving forward or backward, to such obstruction as the supporting cross wire b and their suspenders b' . In order to insure the trolley wheel being kept on the wire, the fingers 4, which are bent first outwardly relatively to each other and then upwardly, convergently, have the downwardly converging portions 6, acting both as guides for the wire a and to strengthen the structure of each finger.

I have found that provision should be made for preventing the fingers 4 from rebounding (upon yielding to the cross wire) materially past their substantially upright position with reference to the casing. The upper bent-off end 4' of each bracket 1 therefore carries a pivot 7 for a lever 8 arranged to move in a horizontal plane and carrying the reversely

set pawls 9 each penetrating the lever 8 and having its inner end notched, as at 10, and its outer end bent-off and formed fork-shaped, as at 11. The notched end of each pawl is adapted to interlock with one of two studs 12 on the adjoining bracket 1, while its forked end is engaged by a spiral spring 13 set in a tube 14 which is riveted to the lever 8. This spring engages the middle tine of the forked end of the pawl, the outer tines acting to limit the movement of the pawl in the lever by engaging the latter when the parts are in the position shown in Fig. 6.

15 denotes springs coiled about the curved pin 16 attached to the bracket 1 and coacting to maintain the lever normally in a position parallel to the face of the bracket 1. When the finger 4 yields to a cross wire, the parts being in the position shown in Fig. 5, it pushes back the pawl 9 obstructing the part of the cam slot in which said finger is moving so as to pass it; this brings the bent-off end of the pawl against lever 8, so that the effect is to turn lever 8 on its pivot against the tension of spring 15. The notched portion of the other pawl now interlocks with stud 12 to hold the lever in this position. When the finger now passes the cross wire and rebounds its rebound is limited because it is thrown against the obstructing pawl 9 which is interlocked with the stud 12, the peculiar formation and arrangement of said pawl relatively to the cam slot and the fact that it must be disengaged from stud 12, acting to check the rebound of the finger; the finger having engaged the pawl, it unlocks it from stud 12 so that lever 8 can assume the normal position thereof shown in Fig. 5.

In order to provide for the removal of the trolley wheel out of contact with the wire for the purpose of reversing the pole, etc., etc., the parts are so constructed that when the trolley rope is pulled upon it causes the fingers 4 to open or move away from each other. To this end, the flat walls m of the casing are formed at their upper ends with slots 17 communicating with cam slots 3, each slot having on the inside of wall n and at both sides of said slot the guides 18. A pocket is thus formed into which the finger 4 is guided by the fact that the turned-off portion 4' of bracket 1 is tapered toward said pocket, with the result that it can only be moved out of such pocket when a positive force is applied, as by engagement with the cross wire. The slots 17 allow the fingers 4 to turn outwardly on their pivots in the blades when the fingers stand upright. The fingers are normally retained in their closed position by the plungers 19 which are guided in the plugs 20 screwed into the ends of vertical cylinders 21 attached to the outside of each casing section. Each plunger is normally held in the position shown in Fig. 2 by a spiral spring 22 coiled about it within the cylinder and inter-

posed between the lower plug 20 and a pin 23 on the plunger. A ring 24 is attached to the lower end of each plunger, and to this is connected the divided ends 25 of the trolley rope 26. The upper end of each plunger is bent-off, as at 27, toward the finger 4, being guided in the slot 17. In this position the horizontal portion 28 of the finger rests on the bent-off portion of the plunger. A lug 29 is formed on each finger near its pivot, so that, should the fingers not turn outwardly of their own weight when the rope 26 draws the plunger downwardly, the bent-off portions of said plunger will engage these lugs and forcibly open the fingers. Thus, when it is necessary to remove the pole from the wire, in order to reverse it, etc., the rope is pulled upon and this automatically effects the opening of the fingers to such a position that they will clear the wire as the pole is pulled downward; of course, as soon as the rope is released, the fingers automatically close again.

An alternative construction, differing from that already described with respect to the manner of mounting the fingers so that they will yield backward and forward upon meeting with such obstruction as the cross wire, is shown in Fig. 9. Each finger is arranged on a blade 30 pivoted on a stud 31, the finger being pivoted in the blade on a rivet 31' so as to move laterally in the same manner that the finger is pivoted on the blade as already described in the first eight figures. The blade is normally retained in an upright position, while being capable of yielding in forward and backward directions, by the curved plungers 32 guided in the wall *n* of the casing and pressed against the opposite faces of the blade by the spiral springs 33, which hold the rounded heads 34 in contact with the blade. It will be understood that when the part of the device shown in Fig. 9 is employed, in lieu of what is shown in Fig. 3, the parts 19 normally prevent the fingers from swinging laterally; at the same time, the spring-actuated plungers 32 hold the blades 30, and hence the fingers, normally against forward and back movement, while allowing them to yield in the forward and back directions.

In applying the device to a trolley pole, the clamp *c* is first adjusted around the pole and then the connection afforded between the clamp and between arm *g* and the part carried thereby, comprising the fingers 4, are adjusted so as to bring the fingers into embracing relation to the trolley and the casing rather close to the wire and to the trolley wheel and standing substantially vertically. This position will be one in which the parts will work to best advantage while the wheel is running along the wire and one which will be the best adapted to allow the fingers to well clear the wire when the trolley wheel is to be removed therefrom and

to guide the trolley wheel to the wire when the pole is reapplied. In this connection it may be remarked that one of the features of great advantage derived by the use of my device is that when the fingers are wide apart, as when the pole is held by the rope, a wide space is afforded between them for the reception of the wire which, once it has been entered into said space, is guided by the fingers into proper position in the groove of the pole. Further, it will be observed that, without regard to the direction in which the car is running, *i. e.*, whether backward or forward, the continuity of the circuit as between the pole and wire will always be preserved, so that the power is constantly within the control of the motorman.

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

1. The combination, with the trolley pole, of mechanism for guiding the wire contact portion of the pole into operative relation to the wire and for retaining the pole in operative contact with the wire comprising upwardly extending pivoted fingers movable toward and from each other, said fingers being also yieldable in the direction of length of the trolley wire, sliding devices normally retaining said fingers in close relation to each other, and means, comprising the pole rope, for controlling the movements of said devices, substantially as described.

2. The combination, with the trolley pole, of mechanism for guiding the wire contact portion of the pole into operative relation to the wire and for retaining the pole in operative contact with the wire comprising upwardly extending pivoted fingers movable toward and from each other, said fingers being also yieldable in the direction of length of the trolley wire, and means having cam slots for effecting the opening and closing of the fingers under the forward and backward movements, substantially as described.

3. The combination, with the trolley pole, of mechanism for guiding the wire contact portion of the pole into operative relation to the wire and for retaining the pole in operative contact with the wire comprising upwardly extending pivoted fingers movable toward and from each other, said fingers being also yieldable in the direction of length of the trolley wire, and means having cam slots diverging forwardly and rearwardly from the normal position of said fingers for effecting the opening and closing thereof under the forward and backward movements of said fingers, substantially as described.

4. The combination, with the trolley pole, of mechanism for guiding the wire-contact portion of the pole into operative relation to the wire and for retaining the pole in operative contact with the wire, and an arm pivotally adjustably connected at one end with

the trolley pole, said mechanism being adjustably connected with the other end of said arm, substantially as described.

5. The combination, with the trolley pole, of mechanism for guiding the wire-contact portion of the pole into operative relation to the wire and for retaining the pole in operative contact with the wire, and an arm pivoted on the pole and having a downwardly curving portion, said mechanism being adjustably supported on said portion of the arm, substantially as described.

6. The combination of the casing having its sides slotted, the forwardly and backwardly yielding fingers movable also laterally, said casing having converging cam-slots controlling said fingers, said fingers normally standing opposite said slots of the casing, and downwardly yielding plungers normally retaining said fingers against outward lateral movement, substantially as described.

7. The combination of the casing having its sides slotted, the forwardly and backwardly yielding fingers movable also laterally, said casing having converging cam-slots controlling said fingers, said fingers normally standing opposite said slots of the casing,

cylinders carried by the casing and downwardly yielding plungers normally retaining said fingers against outward internal movement, substantially as described.

8. The combination of the casing having cam slots and other and laterally extending slots communicating with said cam slots, the forwardly and backwardly yielding fingers movable in said cam slots and also movable into the other slots, and means for controlling the movements of said fingers in said other slots substantially as described.

9. The combination of the casing, the forwardly and backwardly yielding elastic fingers, means for causing said fingers to separate under their forward and backward movements, and means for checking the rebound of said fingers upon their release when in an abnormal position, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 21st day of February, 1908.

JAMES J. JAGOLIN.

Witnesses:

P. ROGERS GEORGE,
WM. D. BELL.