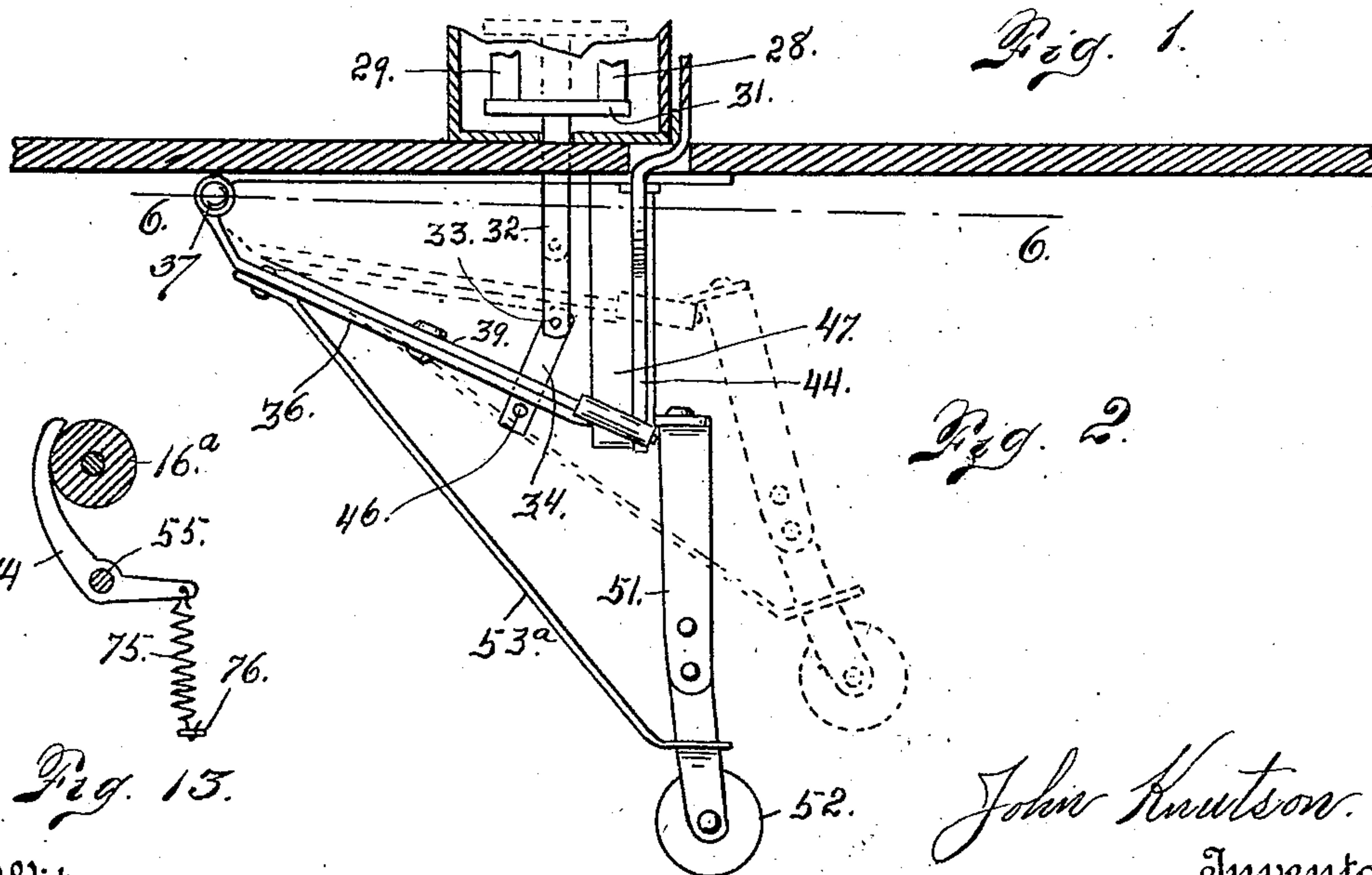
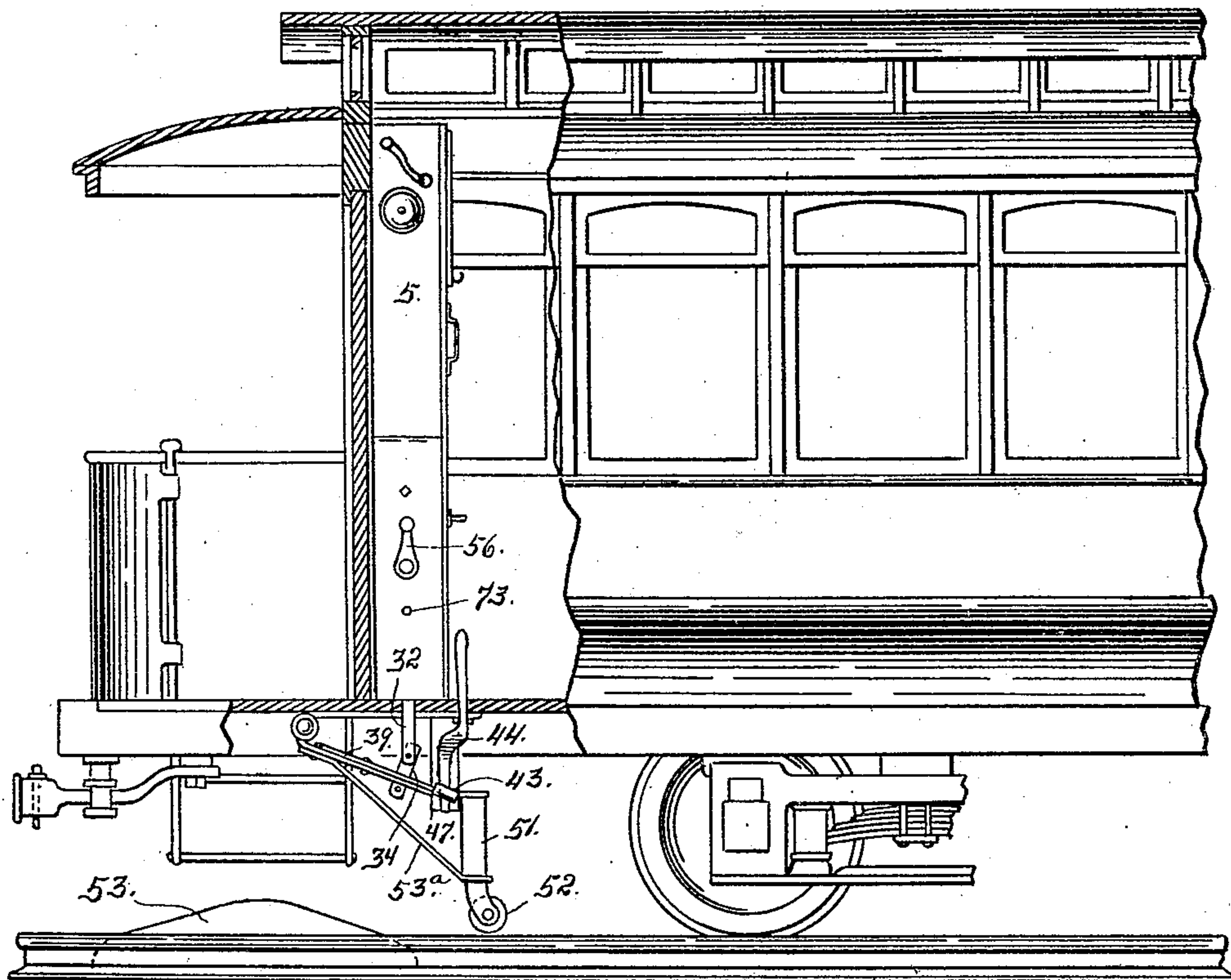


No. 855,319.

PATENTED MAY 28, 1907.

J. KNUTSON.
STATION INDICATOR.
APPLICATION FILED NOV. 1, 1904.

3 SHEETS—SHEET 1.



Witnesses
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3 SHEETS—SHEET 2.

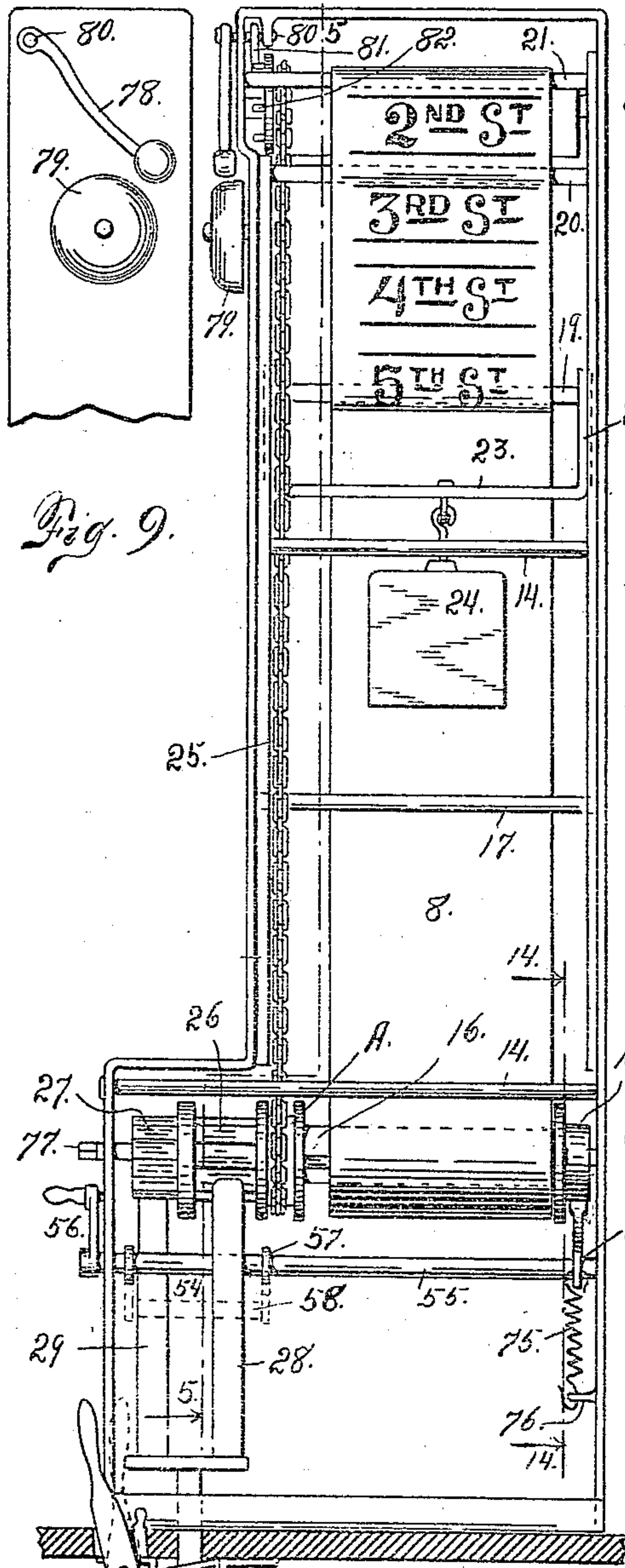


Fig. 9.

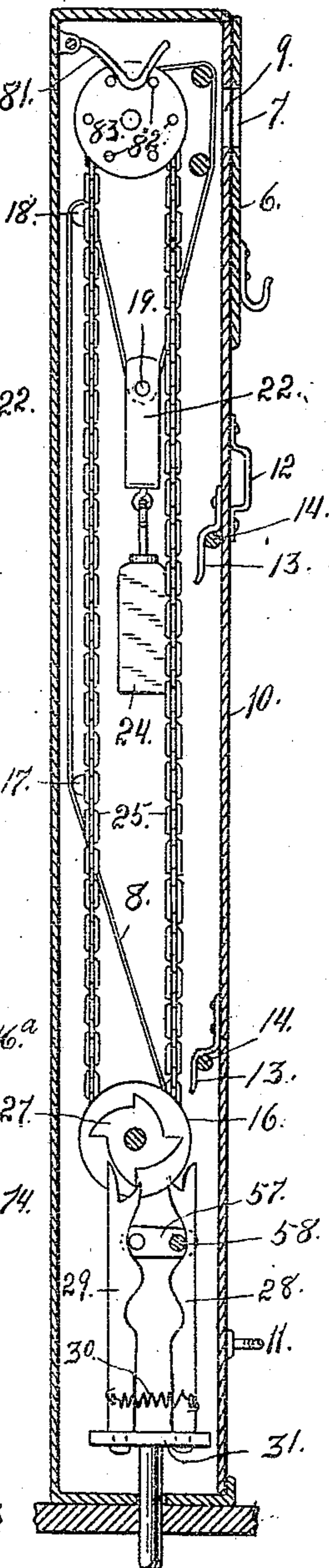


Fig. 4.

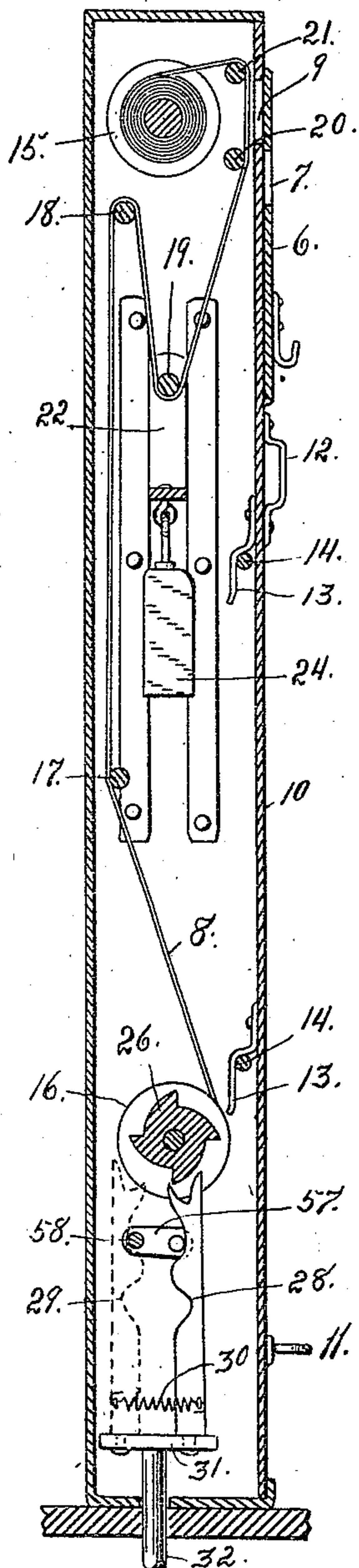


Fig. 5.

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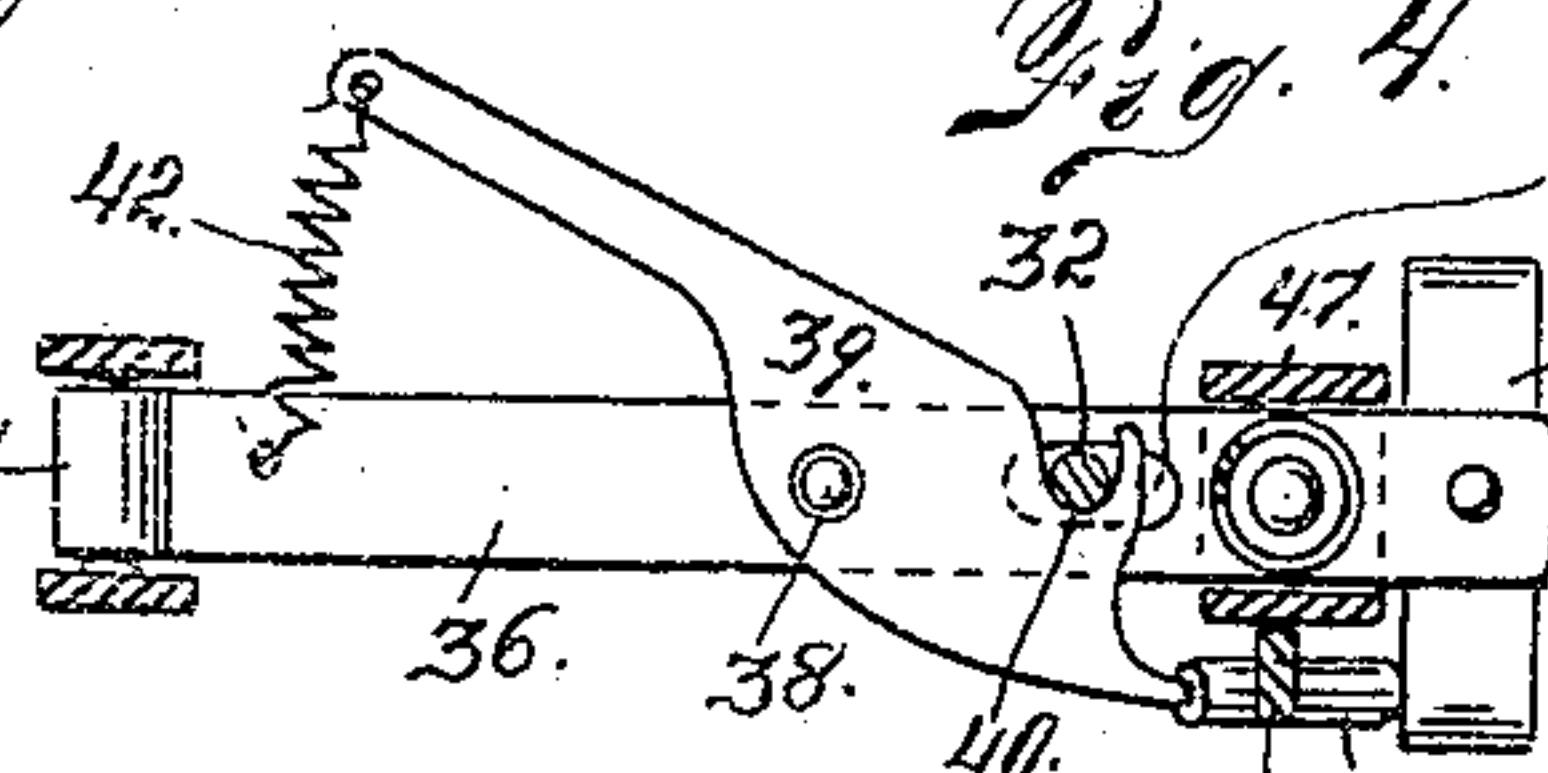


Fig. 6.

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3 SHEETS—SHEET 3.

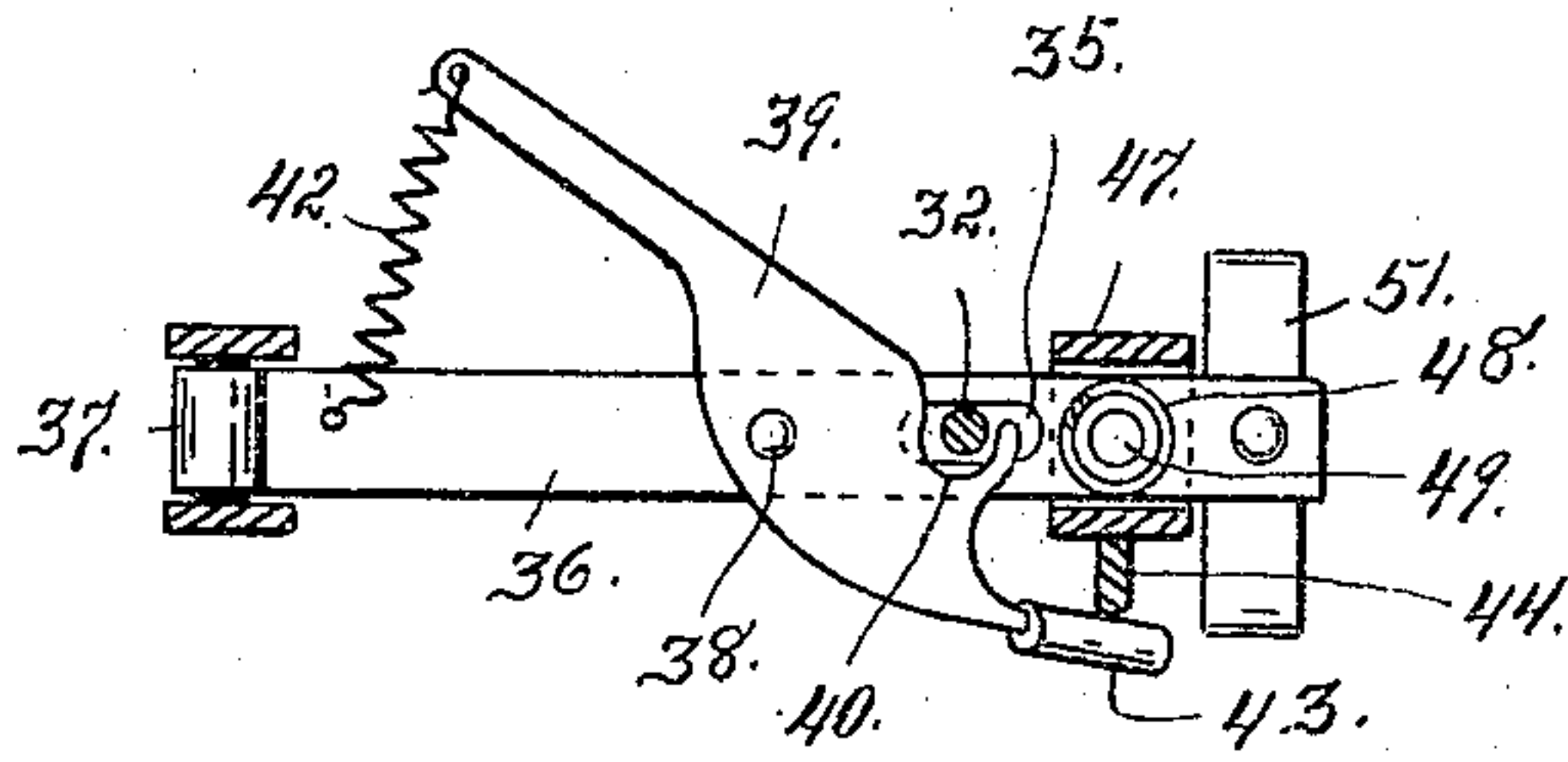


Fig. 7

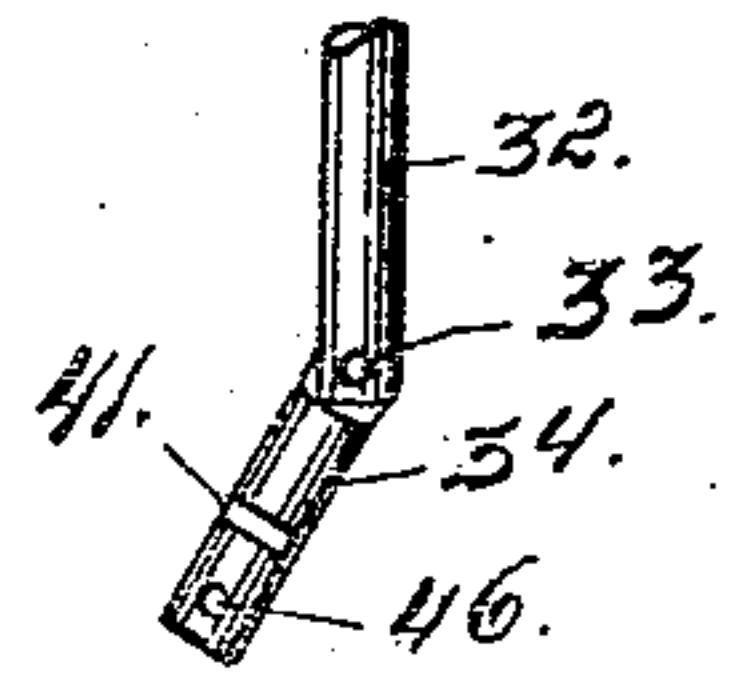


Fig. 12

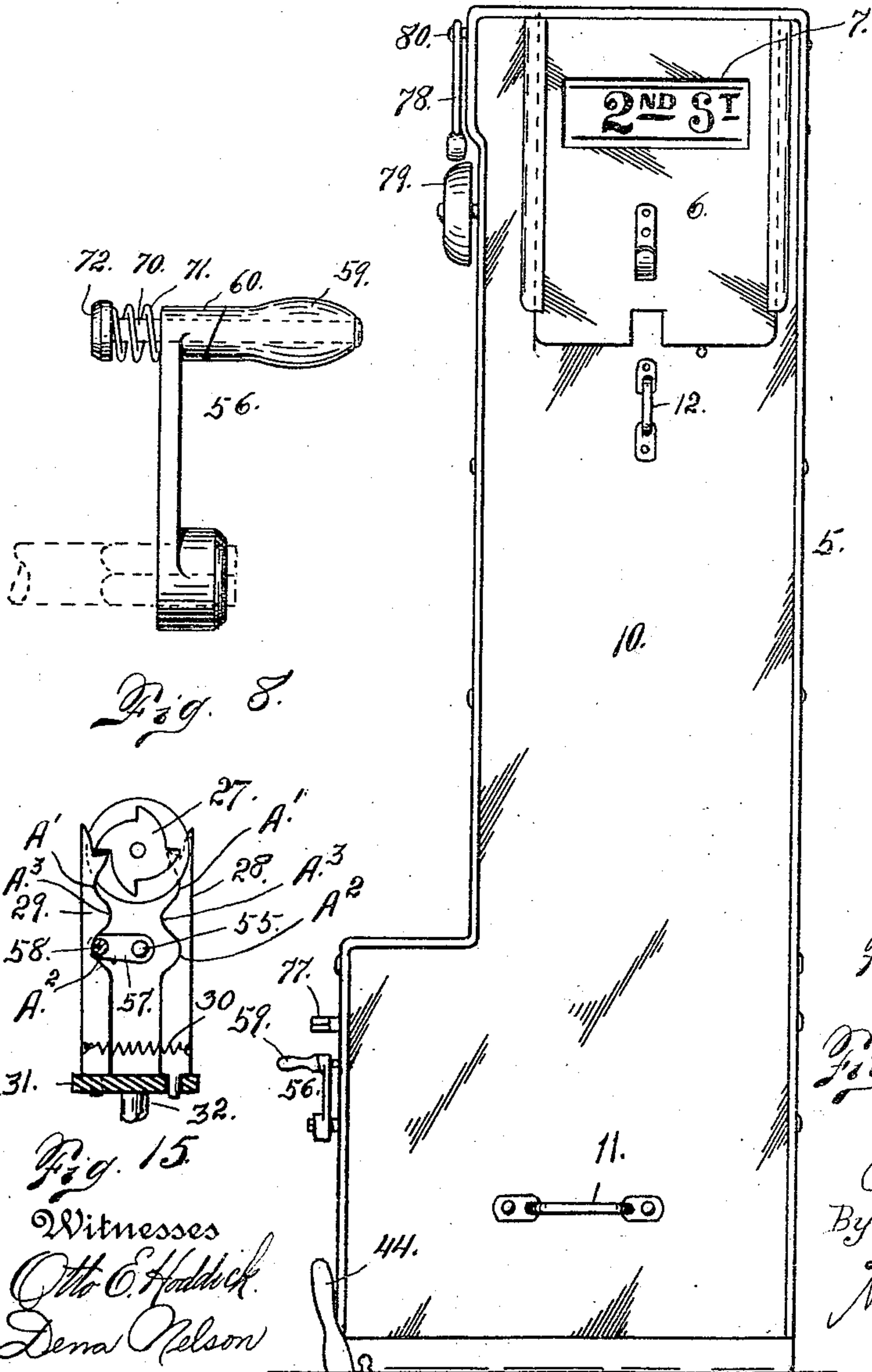


Fig. 8

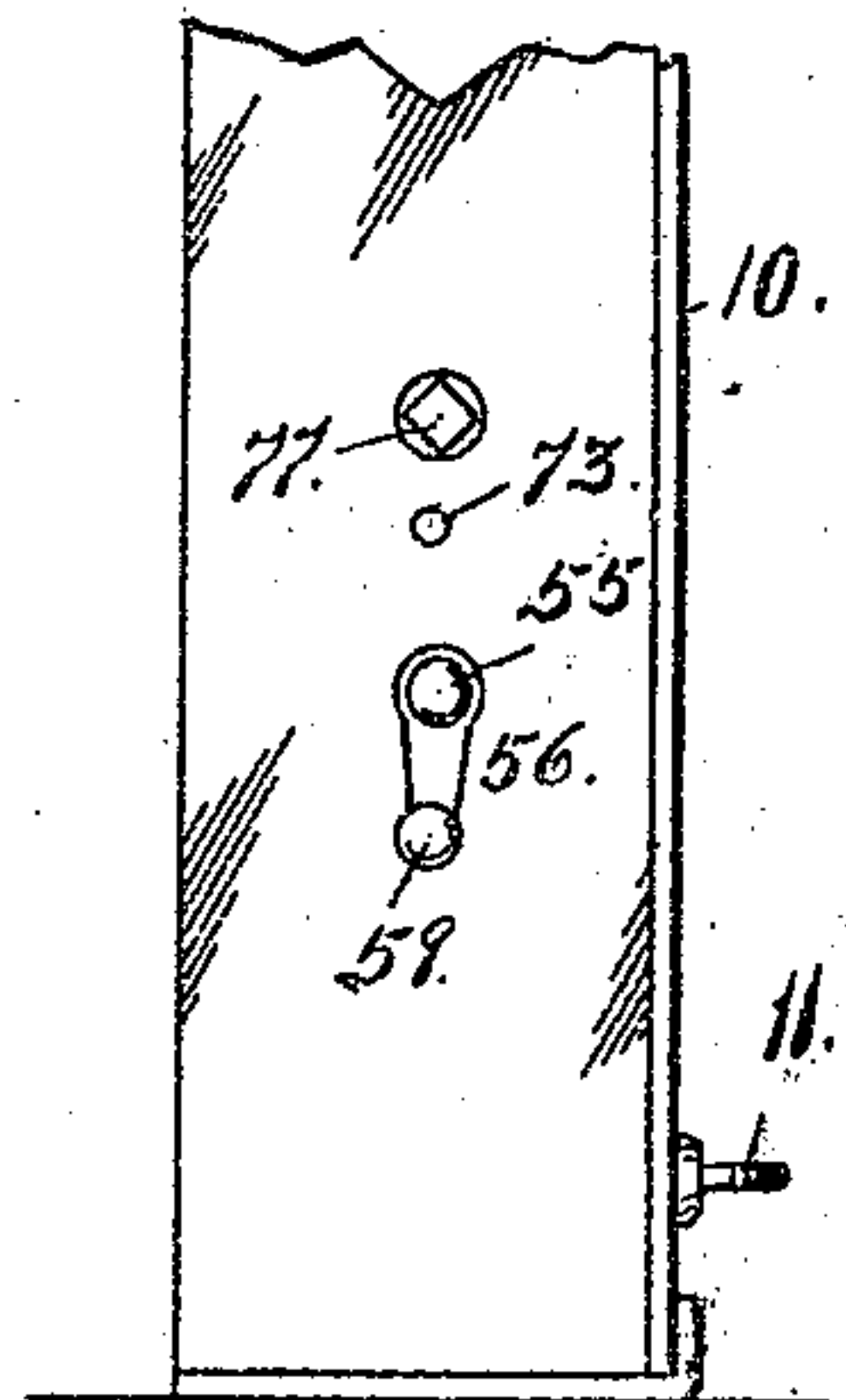


Fig. 10

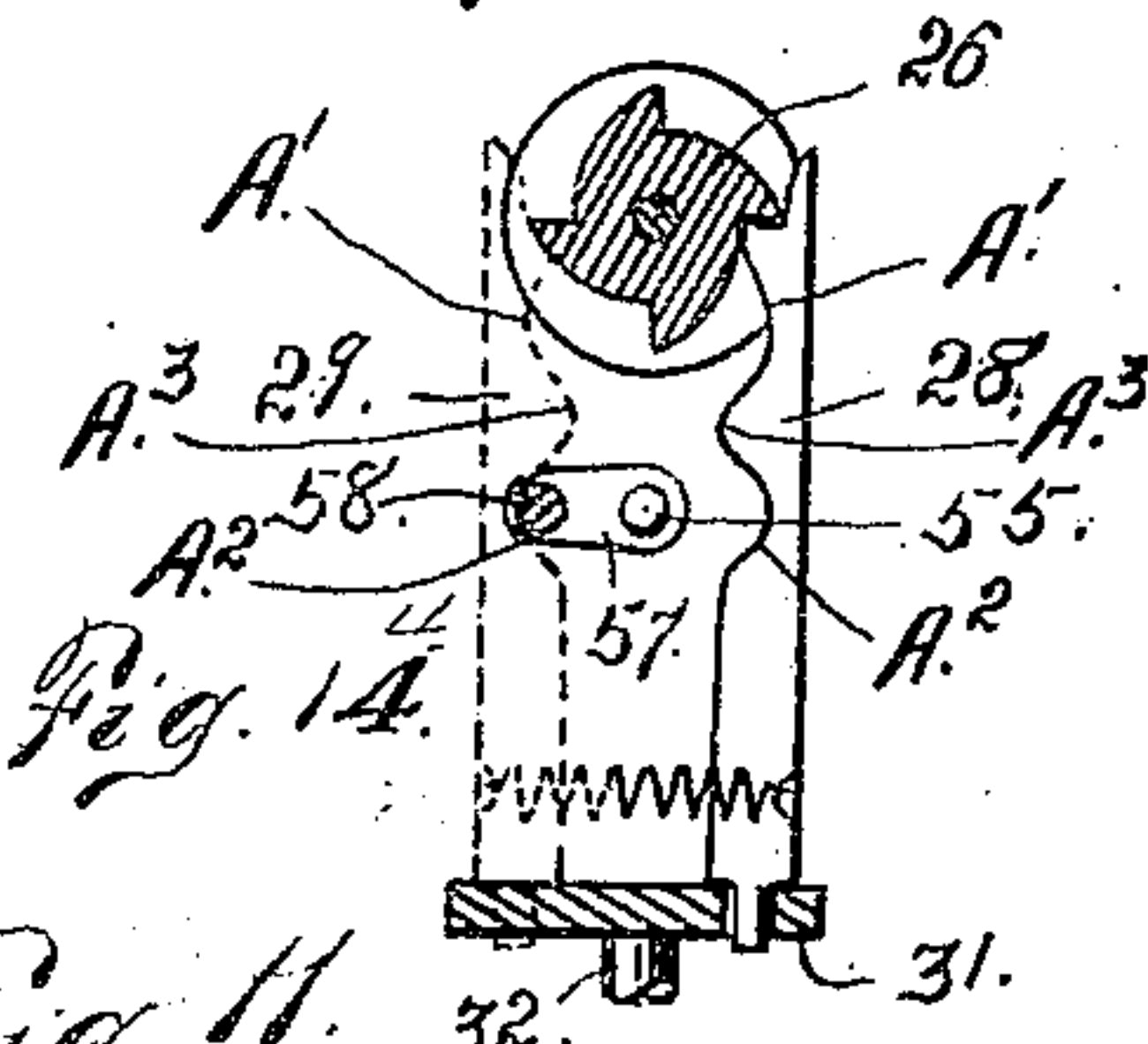


Fig. 14

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UNITED STATES PATENT OFFICE.

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STATION-INDICATOR.

No. 855,319.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed November 1, 1904. Serial No. 230,918.

To all whom it may concern:

Be it known that I, JOHN KNUTSON, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Station-Indicators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in station indicators and it is particularly adapted for use on street cars. Its object is to automatically exhibit the names of the streets as the car moves along.

In my improved construction a suitable name curtain is movably mounted in the car and is caused to move whereby the names of the streets upon the line are successively brought into view by passing in front of an opening in the cabinet or case in which the curtain is mounted. The movement of the curtain is automatically accomplished through the instrumentality of mechanism which engages projections arranged along the track at suitable intervals. A suitable device engaging these projections, is forced upwardly, and through the instrumentality of certain connections, the name curtain is actuated in the one direction or the other, according to the direction in which the car is moving.

Having briefly outlined my improved construction as well as the function it is intended to perform, I will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a fragmentary side elevation of a car whose side is partly broken away in front to disclose the cabinet or case in which the name curtain is located. Fig. 2 is a detail view of the lower part of the mechanism shown on a larger scale and connected with the bottom of the car which is shown in section. Fig. 3 is a front view of the mechanism with the front wall of the casing removed and the bottom of the car shown in section. Fig. 4 is a side view of the mechanism, the casing being shown in section. Fig. 5 is a section taken on the line

5—5 Fig. 3 viewed in the direction of the arrow. Fig. 6 is a section taken on the line 6—6 Fig. 2 looking downwardly. Fig. 7 is a similar view showing the lever in a different position. Fig. 8 is a detail view of the hand crank employed in regulating the position of the pawls or dogs whereby they may be alternately brought into use according to the direction it is desired to move the name curtain. Fig. 9 is a side elevation of the upper part of the casing showing the gong and hammer. Fig. 10 is a similar view of the lower part of the casing. Fig. 11 is a front view of the cabinet or case in which the name curtain and most of the operating mechanism are located. Fig. 12 is a fragmentary detail view of the stem connected with the pawl holder. Fig. 13 is a section taken on the line 14—14 Fig. 3 viewed in the direction indicated by the arrow. Fig. 14 is a sectional view taken through the ratchet 26 and the pawl holder on the dotted line 5—5 in Fig. 3, the position of one of the pawls being indicated by dotted lines and the two pawls being shown at their upward limit of movement. Fig. 15 is an end view of the same construction looking from the left toward the right of Fig. 3 showing the pawls in the same position as in Fig. 14.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a cabinet or case which as shown in the drawing is mounted in the front part of the car and provided with a slide 6 in which is formed an opening through which the names of the streets or stations formed on the name curtain 8 are displayed. The opening 7 in the slide registers with an opening 9 formed in the front wall 10 of the casing. This wall 10 is provided with handles 11 and 12 for convenience of adjustment and is held in place by means of keepers 13 which engage rods 14 mounted in the casing.

In the sides of the casing 5 are journaled upper and lower drums 15 and 16 upon which the name curtain 8 is mounted and adapted to be wound from one to the other. The extremities of this curtain are secured to the drums. Following the curtain from the lower drum upwardly, it extends rearwardly from the drum 16 passing behind rollers 17 and 18 thence downwardly underneath a roller 19, thence upwardly in front of rollers 20 and 21, and thence to the drum 15.

The roller 19 is journaled in the upright arms 22 of a U-shaped frame to whose transverse part 23 is secured a weight 24 for regulating the tension of the name curtain. This weight rises and falls as the size of the drums varies due to the winding and unwinding of the curtain. It will be understood that the drums must be actuated a uniform distance at each movement of the operating devices since the drums are connected by an endless chain 25. Assuming that one drum is full or the whole name curtain is wound thereon, it will be understood that as this drum begins to unwind, a certain part of a rotation will unwind a greater length of curtain than when the drum is smaller; and as both drums are moved the same distance, the smaller diameter of the empty drum would not take up as much curtain as is unwound from the full drum. The weighted frame with which the roller 19 is connected, will therefore take up the slack. On the other hand after the name curtain is nearly unwound from one drum, the length of curtain unwound therefrom by a single movement of the actuating devices, would not be sufficient to allow the other drum the necessary movement. In this event the weighted roller will move upwardly to compensate for the deficiency.

Extending outwardly from the sprocket wheel A of the drum 16, are ratchet zones 26 and 27 having oppositely disposed teeth adapted to be acted on by pawls 28 and 29. These pawls are movably mounted on a part 31 and are connected by a spring 30. Rigidly secured to the part 31 and extending downwardly through the bottom of the car is a stem 32 to whose lower extremity is pivotally connected at 33 a part 34. This part 34 passes through a slot 35 formed in an arm 36 hinged to the bottom of the car as shown at 37 whereby the arm is adapted to oscillate from its hinge pin as a center during the operation of the device. Upon the arm 36 is fulcrumed as shown at 38 a locking lever 39 provided with a notched part 40 adapted to engage a recess 41 formed in the part 34 when it is desired to operate the name curtain. One end of the lever 39 is connected with the arm 36 by a spring 42 while its opposite extremity is provided with an anti-frictional roller 43 which acts on a lever 44 as the arm 36 is moved upwardly. The lever 44 acts as a cam to disengage the locking lever from the part 34 when the arm 36 has moved sufficiently for the performance of its function. By virtue of this construction the name curtain is given a uniform predetermined movement every time the arm 36 is actuated regardless of the distance the said arm travels; since as soon as the locking lever is disengaged from the part 34, the oscillating arm moves idly.

The lever 44 in addition to the performance of the cam function already described,

also enables the person in charge of the car to throw the lever 39 to the unlocked position when for any reason it is desired that the oscillating arm 36 should move idly or without operating the name curtain. This lever is fulcrumed at 45 and one arm projects downwardly into position to act on the roller extremity of the locking lever, while the other arm projects upwardly through the platform of the car and within reach of the motorman or other person in charge of the latter. When this lever 44 is thrown to the position shown by dotted lines in Fig. 3, the lever 39 is thrown to the unlocked position and the arm 36 will move idly.

The arm 34 is provided at its lower extremity with a key 46 which forms a stop to limit the downward movement of the oscillating arm. This arm also passes between the vertical arms of a U-shaped frame 47 secured to the bottom of the car. The closed lower end of this frame also limits the downward movement of the oscillating arm. In this U-shaped frame is mounted a coil spring 48 which is held in place by upper and lower studs 49 and 50. The oscillating arm has an opening through which the stud 49 passes. The function of this spring 48, is to return the oscillating arm 36 to its downward limit of movement after each upward movement for the purpose of actuating the name curtain.

To the rear extremity of the oscillating arm or the extremity farther to the right in Figs. 1 and 2, is attached a depending yoke 51 to whose lower extremity is secured a roller 52 adapted to act on projections 53 secured at suitable intervals between the track rails for the purpose of actuating the oscillating arm whereby the name curtain is operated. These projections are so located that the name curtain is given a movement as the car approaches any street or station, whereby the name of the latter is displayed through the side opening of the casing 5. The yoke 51 is further connected with the oscillating arm by a brace 53^a.

The lower extremities of the pawls 28 and 29 are movably mounted in the pawl holder 31 whereby they are allowed to rock. The spring 30 has a tendency to hold both pawls in position to act on their respective ratchet zones 26 and 27. It is evident, however, that only one of these pawls can be operative at the same time since their tendency is to turn the drum 16 in opposite directions. In order to hold one of these pawls in the inoperative position, I provide a part 54 having the function of a cam. This part is located between the two pawls and when thrown into one position holds one pawl away from its ratchet zone, and when thrown in the other position holds the other pawl away from its ratchet zone. When either pawl is inoperative, the other is held in the operative position by the spring 30.

As shown in the drawing the cam part 54 is mounted on a shaft 55 journaled in the casing and provided with a hand crank 56 exposed on the lower part of the casing. This part 54 is provided with two arms 57 connected by a pin 58 the latter acting on the pawls to throw them to the inoperative position. The arms 57 are rigidly connected with the shaft 55 at their extremities remote from the pin 58. The hand crank 56 is of special construction in order that it may be held in either extreme position of adjustment or whereby the one cam or the other is held in the inoperative position. The hand piece of this crank is composed of two parts 59 and 60. A pin 70 is made fast in the part 59 and is movable both longitudinally and revolubly in the part 60. This pin projects inwardly beyond the part 60 and is normally held at its inward limit of movement by a spring 71. The inner extremity of the pin is provided with an enlargement 72 against which the spring bears. This enlarged inner extremity is adapted to enter openings 73 formed in the casing both above and below the shaft 55. The parts 59 and 60 where they engage each other are provided with inclined or beveled faces whereby, assuming that the parts are in the position shown in Fig. 8, if the part 59 is turned, it together with the pin 71 will be drawn outwardly whereby the extremity 72 is disengaged from the opening 73 of the casing. The crank may then be turned to throw the cam device 54 to the opposite position of adjustment. Upon the shaft 55 is also fulcrumed a brake lever 74 one extremity of which engages the part 16^a of the drum 16 (see Figs. 3 and 13). Connected with one arm of this brake lever is a spring 75 which may be of any desired tension according to the power required. The extremity of this spring remote from the lever, is connected with a stop 76 on the frame or casing.

The journal at one extremity of the drum 16, protrudes from the casing as shown at 77 and is fashioned to receive a crank or key, whereby the drum may be turned to regulate the position of the name curtain as desired or to adjust the latter so that any desired street name may be automatically displayed as the car proceeds.

In order to announce the coming of any station name into view, I have provided means whereby a hammer 78 strikes a gong 79 mounted on one side of the casing. The arm of this hammer is made fast to a spindle 80 journaled in the casing and to whose inner extremity is connected a cam 81 which engages pins 82 formed on a disk 83 mounted to rotate with the drum 15. As this drum is given a partial rotation for the purpose of displaying a station name, one of the pins 82 acts on the cam 81 to actuate the hammer 78 whereby the latter is raised and released causing it to strike the gong 79.

From the foregoing description the use and operation of my improved device will be readily understood. As the car moves along the track, every time the roller 52 encounters a projection 53, the oscillating arm 36 is raised to the position shown by dotted lines in Fig. 2, whereby one of the dogs 28 or 29 is made to impart a partial rotation to the drums 15 and 16 carrying the name curtain as heretofore described. In case the arm 36 is moved farther than is necessary to give the proper movement to the drums, the lever 44 engages the arm 39 and throws it to the unlocked position whereby the arm 36 is disengaged from the hinged part 34 of the stem 32. This operation will be repeated as often as the roller 52 engages a projection 53. After the car has reached one end of the line, assuming that it is to make the reverse movement, the handle 56 is adjusted to throw one pawl 28 or 29 to the inoperative position whereby the other one which was previously inactive, is brought into the operative position for actuating the drums. The operation on the return trip, is of course the same as before except that the name curtain is moving in the opposite direction whereby the names of the streets or stations are displayed in the reverse order.

In further explanation of the construction and operation of the pawls 28 and 29, attention is called to the fact that each of these pawls is provided with two recesses A' and A² separated by a projection A³. When the cam 54 is adjusted to throw either pawl to the inoperative position, the part 58 of the cam engages the upper recess A' of the pawl (see Figs. 4 and 5). Now as the pawl holder is moved upwardly to actuate the drums, the pawl not engaged by the cam, acts to impart the rotary movement to the drum, while the other pawl moves outwardly away from the drum by virtue of the engagement of its projection A³ with the part 58 on the cam, but the upward movement is sufficient to cause the projection A³ to ride over the cam and allow its part 58 to enter the lower recess A² of the pawl, in which event this pawl moves inwardly and engages a tooth of its ratchet, to lock the drum against further movement by the actuating pawl. This operation is illustrated in Figs. 14 and 15, the actuating pawl being clearly shown in Fig. 14 and the locking or retarding pawl shown in Fig. 15. This locking or retarding feature of the one pawl is of great importance, since if it were not for this feature, a sudden and forceful movement of the operating mechanism from beneath the car, would often cause the drums to move much farther than they should; but this feature forms a positive lock against farther movement of the drums than is necessary. As soon as the actuating impetus ceases, and the pawls drop downwardly, the action of the brake lever 74 is

sufficient to retain the drums in their normal position until they are again actuated by one of the pawls.

Having thus described my invention, what I claim is:

1. The combination with a suitable casing, of drums mounted therein, a name curtain mounted on the drums, one of the latter being provided with ratchet zones, pawls adapted to engage the respective zones, a reciprocating pawl holder, means for actuating the said holder, a shaft journaled in the casing and provided with a cam interposed between the two pawls for throwing either pawl out of the drum actuating position while the other pawl remains in position to actuate the drum, the relatively inactive pawl serving when at its upward limit of movement to prevent the drum from moving too far under the influence of the actuating pawl, an exposed crank connected with the shaft, the crank being provided with a longitudinally movable spring-actuated part provided with a cam face engaging a similar opposing face on the relatively stationary part, the movable part being also allowed a partial rotary movement, the casing being provided with a socket adapted to receive one extremity of the movable part whereby the crank and its connections are locked in the adjusted position.

2. The combination with station indicating mechanism mounted on a car, of a reciprocating device for actuating the mechanism, the said device being provided with a stem passing through the bottom of the car and having a part pivotally connected with its lower extremity, an oscillating arm mounted on the car and having an opening to receive the stem and its pivoted part, a depending part connected with the oscillating arm and adapted to be automatically actuated from

the track, a device mounted on the oscillating arm for locking the pivoted part of the stem thereto, and suitable means for unlocking the lever after the arm is moved upwardly a predetermined distance.

3. The combination with station indicator mechanism mounted on a car, of depending operating means connected with the bottom of the car, and a connection between said depending means and the indicator mechanism, the operating means consisting of an oscillating arm having a depending part, a locking device mounted on the oscillating arm and adapted to lock the latter to the connection with the indicating mechanism, and a lever mounted on the car and projecting up through the bottom thereof for unlocking the locking device of the oscillating arm.

4. Station indicating mechanism including a drum having two ratchets provided with oppositely disposed teeth, and a pair of separated pawls mounted to reciprocate and arranged to cooperate with the two ratchets, each pawl having two recesses separated by a projection, a cam adapted to be adjusted to throw either pawl out of the drum-actuating position, the cam in this event engaging the upper recess of the pawl, and means for moving the pawls sufficiently to bring the cam into the lower recess of the pawl which it engages, the arrangement being such that the cam engaged by the pawl serves when at its upward limit of movement to engage its ratchet and lock the drum against moving too far in response to the actuating movement of the other pawl.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN KNUTSON.

Witnesses:

DENA NELSON,
A. J. O'BRIEN.