

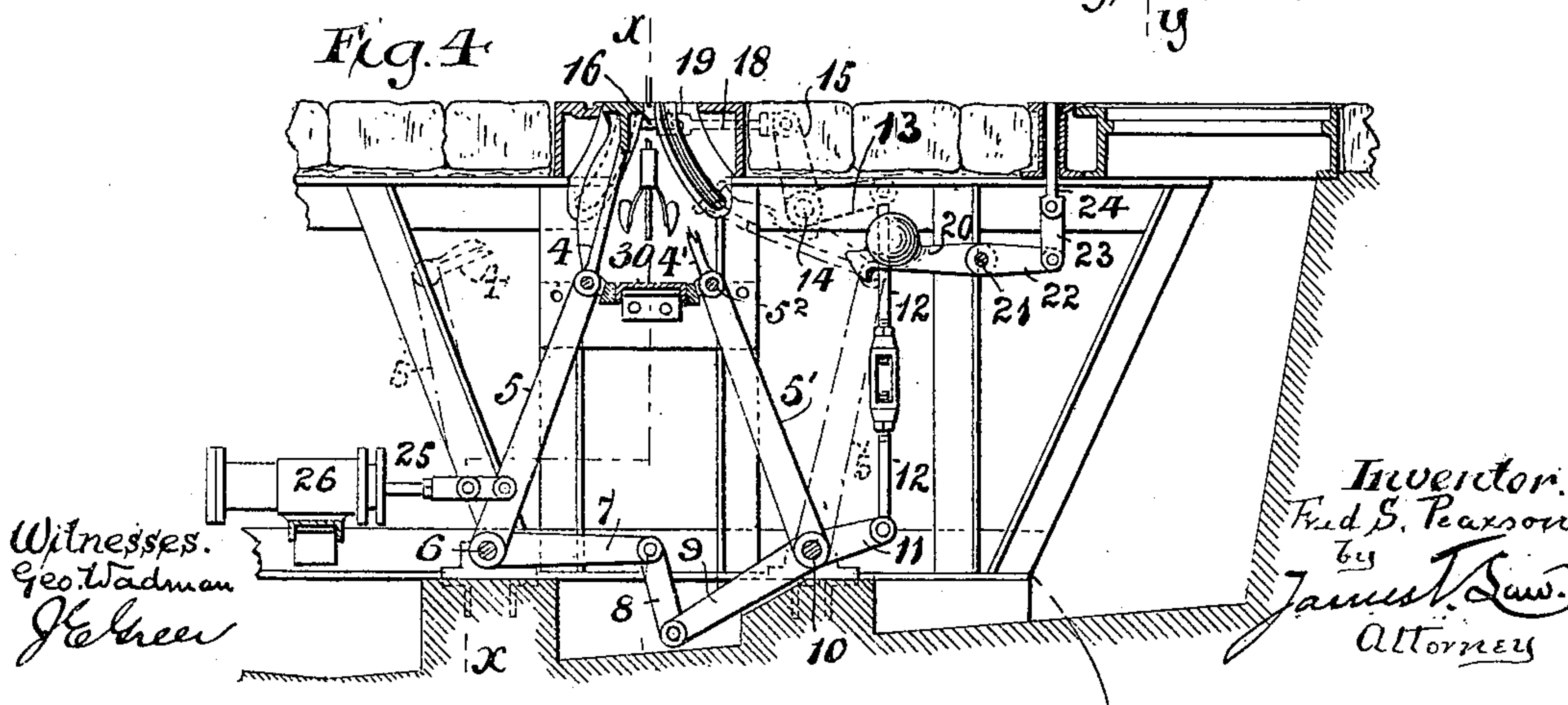
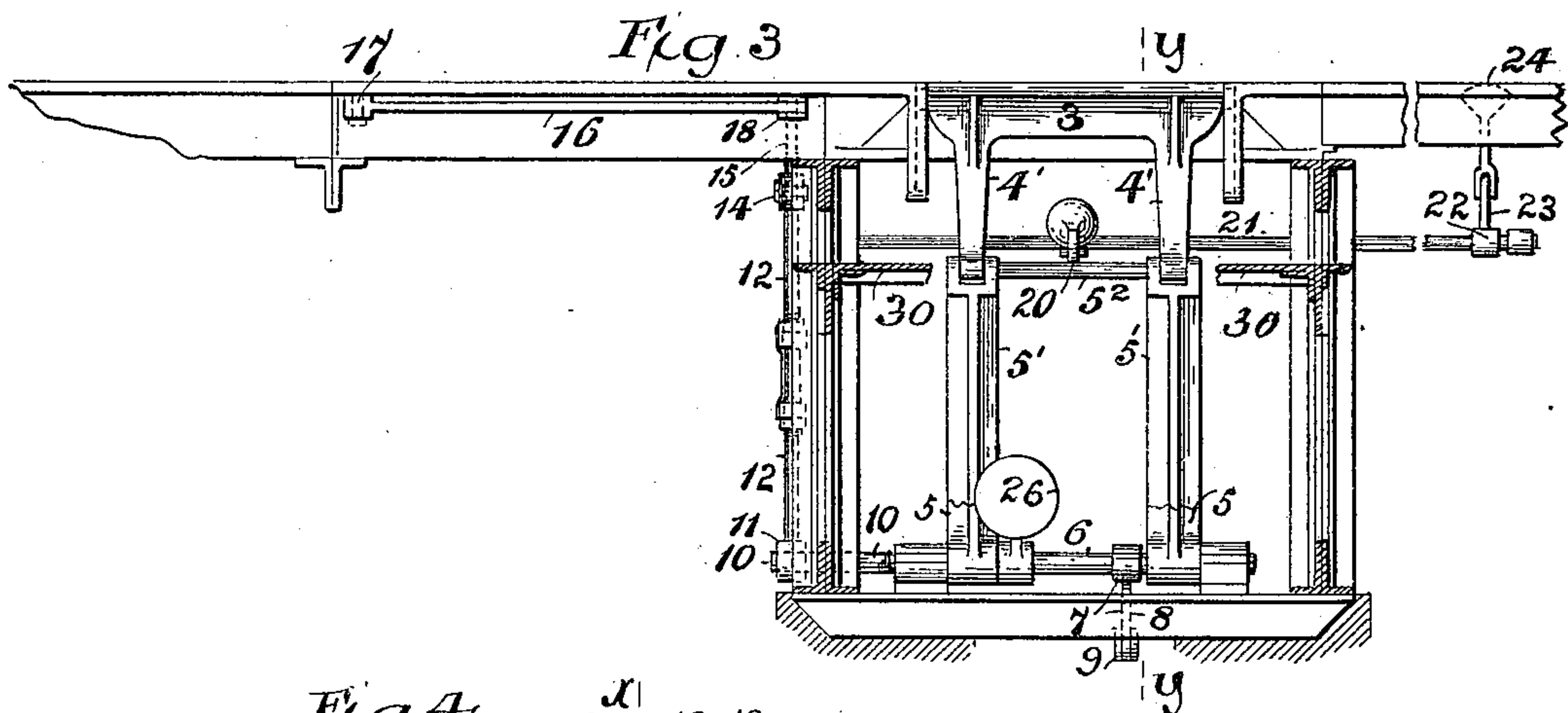
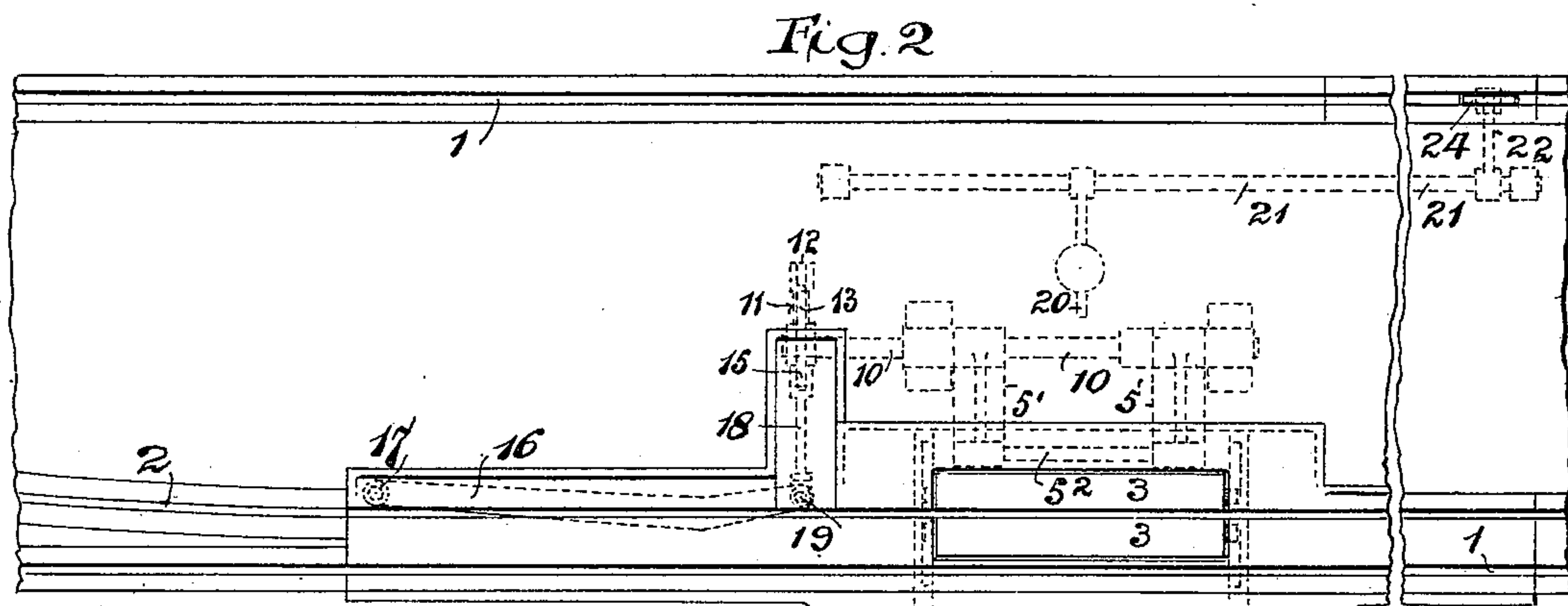
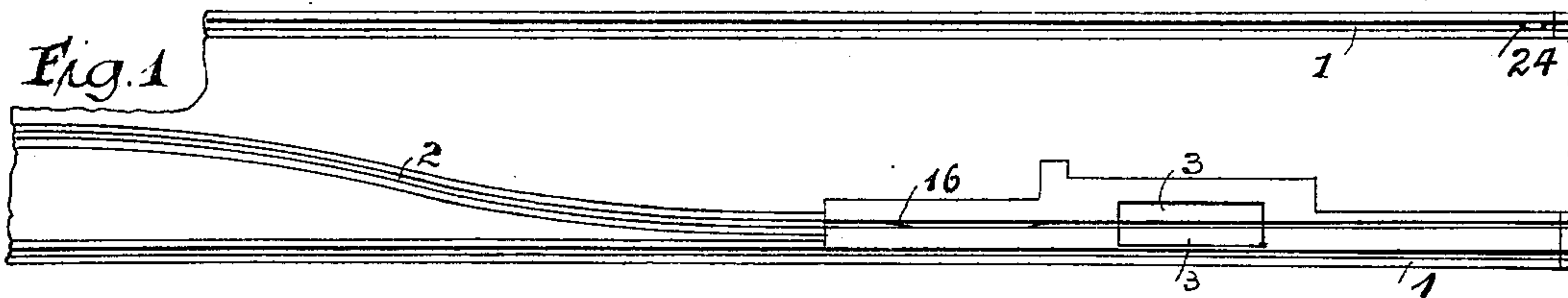
No. 619,783.

Patented Feb. 21, 1899.

F. S. PEARSON.  
CONDUIT FOR RAILROADS.

(Application filed Feb. 11, 1898.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

FRED S. PEARSON, OF BOSTON, MASSACHUSETTS.

## CONDUIT FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 619,783, dated February 21, 1899.

Application filed February 11, 1898. Serial No. 669,909. (No model.)

*To all whom it may concern:*

Be it known that I, FRED S. PEARSON, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Conduits for Railroads, of which the following is a specification.

This improvement relates to conduits or subways for street-railways; and it consists of a door or trap in the top of the conduit which is automatically pressed by the passage of the car over the track and through which the grip or plow of the cable or electric car is raised from the conduit onto the car. It sometimes occurs that the same car is run over two sections of the road, one of which has a conduit or subway and the other of which is without such conduit—as, for instance, when the car is propelled by an underground electrical system, then by an overhead trolley. As a matter of course, before the car from which depends the electrical plow or the grip can pass over the section of the road not provided with the conduit the plow or grip must be lifted from the conduit, and this invention is intended to provide a suitable opening for this purpose in the top of the conduit, closed by a door which is automatically opened by the car as it passes in position over the opening and which closes itself as the car passes beyond the latter. In my Letters Patent No. 603,656, dated May 10, 1898, I have shown such a construction in which the mechanism by which the door or trap is opened is actuated or operated by the wheel of the car passing over the track. In the improvement described herein I show a similar construction to that shown in the patent above, but in which the mechanism operating the door is actuated by the plow or grip in the conduit.

In the accompanying drawings, illustrating my improvement, Figure 1 is a plan view of the track, showing the position of the trap or door. Fig. 2 is an enlarged plan view of the track, showing the trap and, in dotted lines, the mechanism for operating the same. Fig. 3 is a side elevation of the trap and mechanism for operating the same through the line  $x x$ , Fig. 4; and Fig. 4 is an end elevation, partly in section, through the line  $y y$ , Fig. 3.

1 1 are the rails on which the cars run, and

2 is the slot-rail, through which the electric plow projects into the conduit.

3 is the trap or door into the conduit. As will be seen from Figs. 1 and 2, this door is situated at the side of the road, next to one of the rails, in order that when the plow is raised into the car it will be under the seat of the latter, and the slot-rail 2 is deflected from the center of the road sidewise, and thus made to carry the plow in position under the trap. As shown, the trap or door is in two parts or sections, having the opening or slot between them. These sections are held in place and automatically raised and lowered by the mechanism shown in Figs. 3 and 4 and erected in the conduit beneath the trap. On the under side of each section 3 of the trap are two arms 4 4', the lower ends of which are pivoted in the upper ends of the levers 5 5', mounted on the rock-shafts 6 and 10, respectively. On the shaft 6 is a short arm or lever 7, the outer end of which is connected by a link 8 with a lever 9, secured to and turning with the rock-shaft 10. The rock-shafts 6 and 10, and consequently the levers 5 and 5', secured to the two sections of the trap, are thus connected with each other, insuring the two parts of the trap moving together when the trap is opened or closed. When the trap is closed, the levers 5 and 5' occupy the position shown in Fig. 4, with their upper ends, to which the rods 4 and 4' are connected, resting against the cross-piece 30.

The shafts 6 and 10 are revolved and the levers 5 and 5' thrown back or outward to open the trap 3 by the following mechanism: On the rock-shaft 10 is mounted a short arm 11, to the other end of which is connected the vertical rod 12. The upper end of this rod is connected to the arm 13 of the bell-crank 13 15, (shown more particularly in dotted lines in Fig. 4,) which turns on the stud 14 in the upper part of the framework. As will be understood from Fig. 4, as this bell-crank 13 15 is turned on its stud it moves the rod 12 up and down, and thereby raises and lowers the arm 11 on the shaft 10 and turns this shaft and also the shaft 6, connected with it, so as to move the levers 5 and 5' back and forth, and thus draw down and push up the sections of the trap 3 and open and close the latter.

In front of the trap-door 3, below the slot in



the slot-rail and in line with the latter, is a lever or actuator 16, pivoted at one end 17, so as to move in a horizontal plane, and connected at the other end by a link 18 to the arm 15 of the bell-crank. As shown in Fig. 2, the center of the lever 16 is angular or curved and projects across the line of the slot in the slot-rail and in the path of the shank of the plow or grip as the latter passes in the slot, the arrangement of the lever being such that as the plow or grip moves along in the slot it comes in contact with the lever and swings it to one side. As the lever 16 is thus moved to one side it turns the bell-crank 13 downward through the link 18, connected to it, and the latter in turning, by means of the rod 12, as above described, pushes down the arm 11 and turns the rock-shaft 10, so as to throw outward or back the lever 5'. As above stated, as the two rock-shafts 6 and 10 are connected with each other by the levers 7 and 9 and link 8, as the rock-shaft 10 is revolved it revolves the other shaft in the opposite direction, and thus the levers 5 and 5', connected with both sections of the trap 3, are thrown back or outward at the same time. As these levers move outward they draw the sections of the trap down and back by means of the rods 4 and 4', to which they are connected, and thus open the trap. The position of the several parts when the trap is thus drawn down or opened is indicated by dotted lines in Fig. 4. On the frame at each end of the trap are curved pieces 19, in which projections on the ends of the trap slide and by means of which the sections of the trap are guided and held steady as they are drawn down or pushed up when the trap is opened or closed.

To hold the trap-sections down or the trap open while the plow or grip is lifted through the latter, I employ a latch 20, the hook of which engages the cross-bar 5<sup>2</sup>, extending across the top of the levers 5, when the latter is thrown back, as will be seen from Fig. 4. This latch is mounted on a rod 21, supported in bearings along the side of the framework, so as to turn therein, and has connected to it at one end an arm 22, projecting in an opposite direction from the latch, so that as the arm is depressed the latch will be raised. The position of this arm 22 is such that its outer end is directly beneath the track, and from the arm extends a rod 23, terminating in a suitable head 24 in the track in the path of the wheel of the car, the arrangement of the several parts being such that as the car-wheel passes over this part of the track it presses down the head 24 of the rod 23, thus turning the arm 22, and with it the rod 21, so as to raise the latch 20 and release the cross-bar of the levers 5. On the end of the latch is a weight 28 to insure the latch falling and catching on the cross-bar 5<sup>2</sup>.

The mechanism by which the trap is raised and lowered is so constructed and arranged

that as soon as it is released from engagement with the latch it returns to its original position, thus sliding the sections of the trap up and closing the same.

To prevent the slamming and jarring of the apparatus when the trap is opened, the piston 25 of the dash-pot 26 is attached to the lever 5, whereby the piston is driven into the dash-pot, when the lever is thrown back and the trap opened.

The operation of the mechanism is as follows: As the car passes along to the place where it is desired to withdraw the electrical plow or the grip from the conduit the plow or grip is first guided to the side of the road-bed in position to be beneath the trap. Before it reaches the trap the shank of the plow or grip strikes against the lever or actuator 16, which lies in its path and deflects the latter to one side. The lever in turning operates the trap mechanism, whereby the sections of the trap are drawn down or back and the trap opened as the plow or grip arrives beneath it. As the trap mechanism is drawn back and the trap opened it is held in this position by the latch. The plow or grip is then raised from the conduit and placed on the car and the latter proceeds on its way. As the car passes beyond the trap the wheel of the car presses down the head 24 in its path, thus turning the bar 21 and raising the latch from its engagement with the trap mechanism, allowing the latter to return to its original position and close the trap. The trap is thus automatically opened by the car and closes at once as soon as the car has passed beyond it. As will be understood from Fig. 4, the position of the levers 5 and 5' is such that they act as braces in holding up the sections of the trap, and the latter cannot be pressed down and opened by any pressure on the top of the trap, as by anything stepping on or passing over the same, it being impossible to open the trap except by means of the trap mechanism operated by the tongue placed alongside of the rail.

What I claim is—

1. In a conduit for railroads, in combination, a trap in the top of the conduit; mechanism by which the trap is opened and closed; and an actuator arranged to be moved by the plow or grip depending from the car whereby the trap mechanism is operated, substantially as described.

2. In a conduit for railroads, in combination, a trap in the top of the conduit; mechanism by which the trap is opened and closed; an actuator arranged to be moved by the plow or grip depending from the car whereby the trap is opened; and mechanism whereby the trap is held open, arranged to be released by the car-wheel, substantially as described.

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