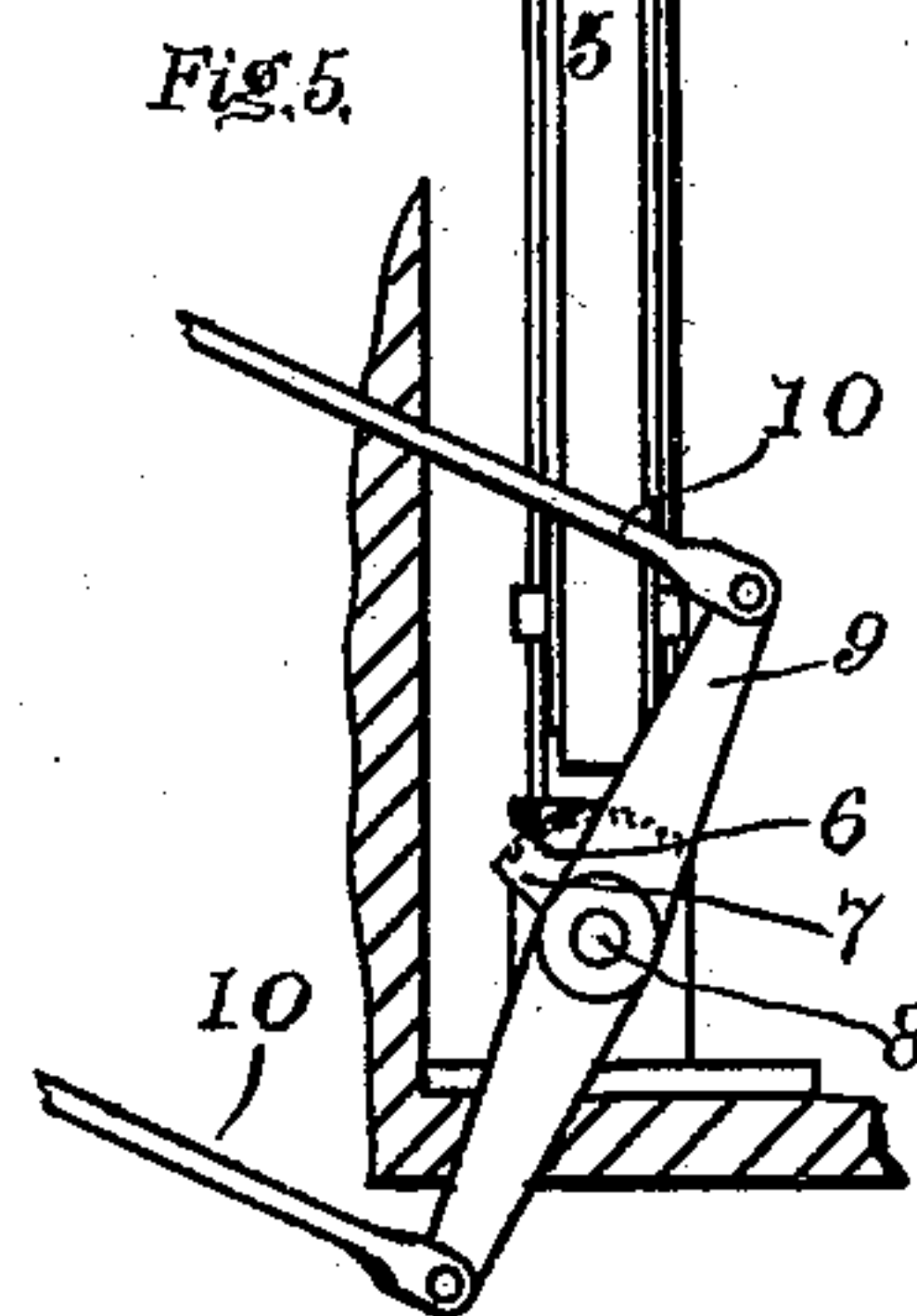
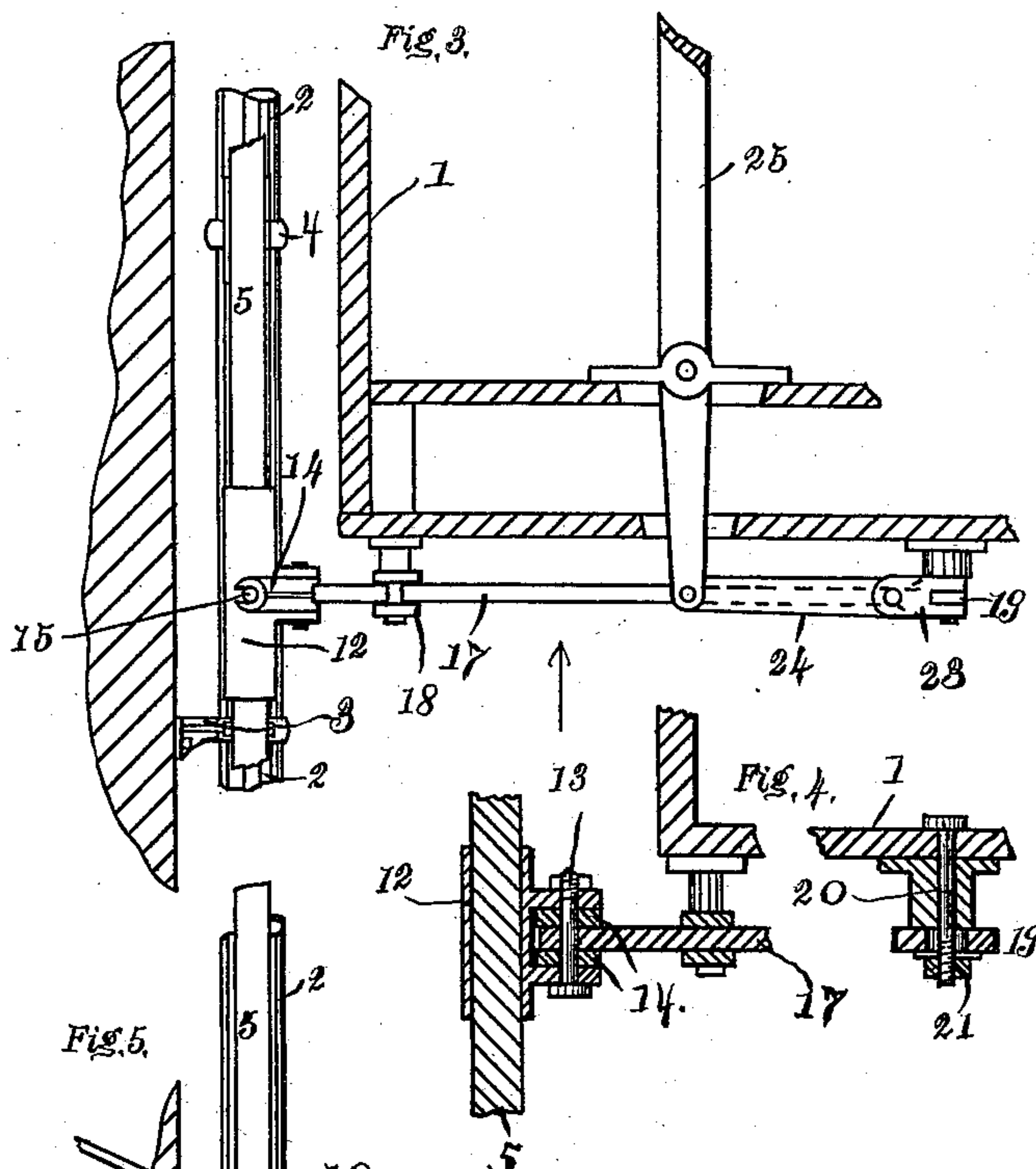
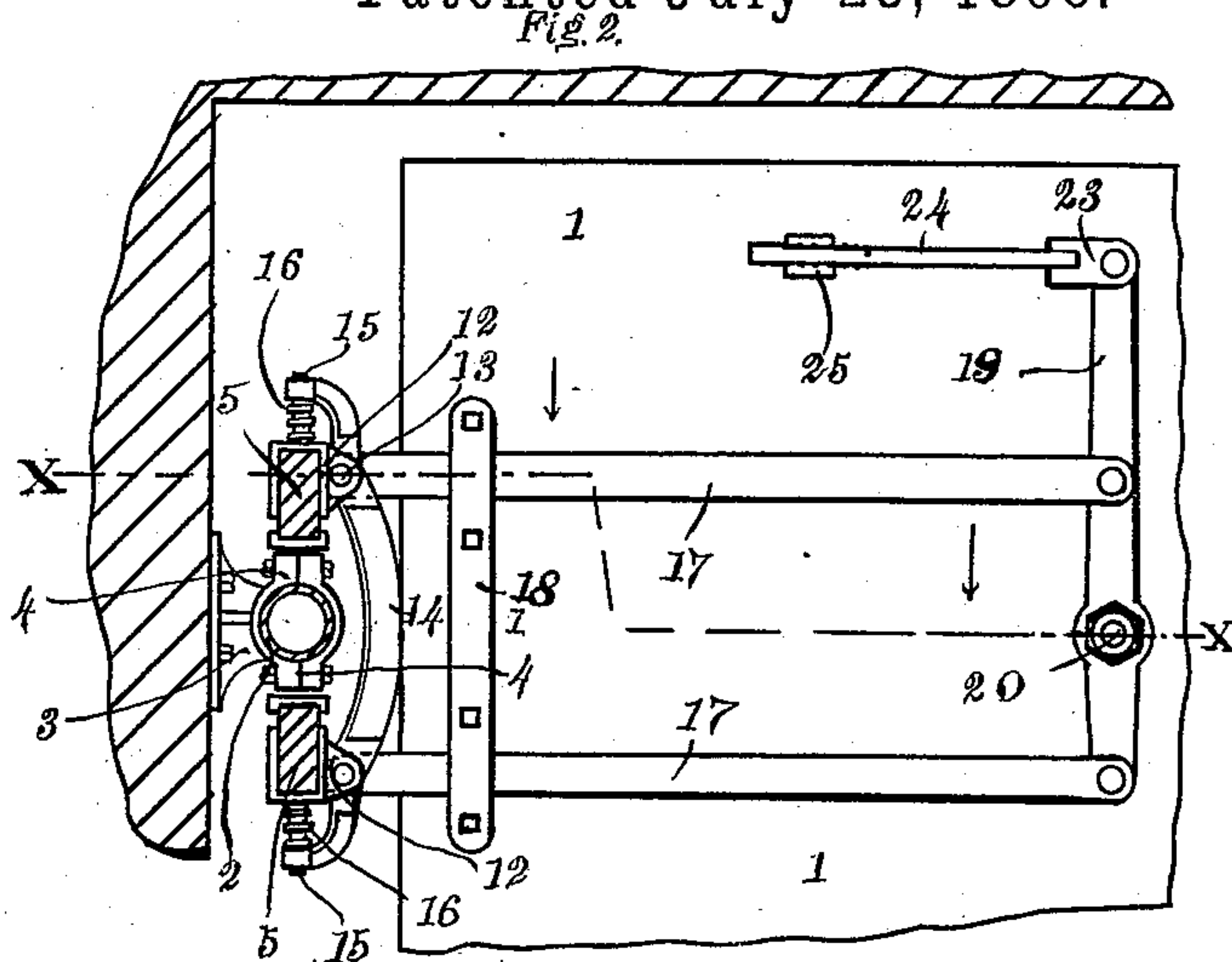
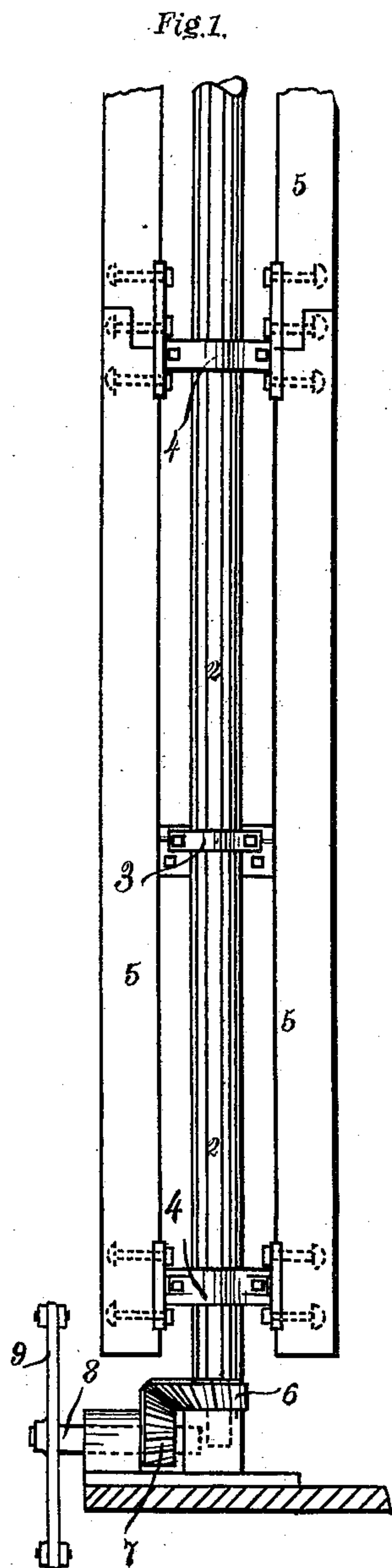


(No Model.)

F. B. GRAVES.  
ELEVATOR CONTROLLER.

No. 543,011.

Patented July 23, 1895.



Witnesses;  
Thomas Durant  
Wallace Murdock

Inventor;  
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# UNITED STATES PATENT OFFICE.

FRED B. GRAVES, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE GRAVES ELEVATOR COMPANY, OF SAME PLACE.

## ELEVATOR-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 543,011, dated July 23, 1895.

Application filed April 2, 1895. Serial No. 544,189. (No model.)

*To all whom it may concern:*

Be it known that I, FRED B. GRAVES, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Elevator-Controllers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention has for its object to provide an improved controlling device for elevators of that class embodying a movable operating portion on the car having a running hold on a suitable oscillatory shaft or frame arranged in the elevator-well; and it consists in certain improved constructions and combinations of parts, all as will be hereinafter fully described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a sectional view through one corner of an elevator-car, showing my improved operating devices in side elevation; Fig. 2, a view of the bottom of the car; Fig. 3, a front elevation of the rock shaft or frame; Fig. 4, a sectional view on the line  $xx$  of Fig. 2; Fig. 5, a side elevation of the lower portion of the rock shaft or frame.

Similar reference-numerals in the several figures indicate similar parts.

The body of the elevator-car 1, a portion of which only is shown, may be of the usual or any preferred construction and operated in the well by any suitable operating mechanism, and arranged in the well at one side of the car is a vertical shaft capable of oscillation on its vertical axis and connected to the devices for controlling the motor actuating the car, whether such motor be operated by hydraulic or electric power, and the form I prefer to employ is supported on bearings near its center and is provided with continuous ways extending beyond said bearings on opposite sides in order to afford an uninterrupted operating-surface for the devices on the car. Thus the shaft is constructed of a central tubular portion 2, supported at suitable intervals in bearings 3, attached to the side of the well, and connected to opposite

sides of said portion 2 by brackets 4 are the parallel bars or ways 5, constructed, as shown, in sections, their ends being connected so as to break joints, and in the present construction of my invention a beveled pinion 6 is provided at the lower end of the shaft, meshing with a beveled segment 7 on a rock-shaft 8, to which is attached a double rock-arm 9, connected by rods 10 with the valve mechanism of a hydraulic motor or the controlling-switch of an electrically-operated motor. It will be understood that I thus provide two continuous ways on opposite sides of the central portion 2 of the shaft arranged at some distance from the center of oscillation, so that by pushing or pulling on said ways the shaft or frame may be oscillated to control the movement of the car.

The controlling means mounted upon the car embody two shoes 12, embracing the outer side of the bars or guides 5 and pivoted by means of lugs 13 upon a connecting-bar 14, the ends of said bar 14 being extended outward beyond the outer sides of the shoes and bifurcated or apertured for the passage of guide pins or projections 15 on said shoes, and springs 16 are arranged between the ends of the bar 14 and the shoes surrounding the guide-pins, as shown in Fig. 2, the function of the springs being to press the shoes tightly on the guides 5. Also pivoted to the shoes and the bar are rods or bars 17 passing loosely between guides in the form of plates 18 secured to the under side of the car, the inner ends of said rods being pivoted to a lever 19 on opposite sides of its pivot 20, so that as said lever is oscillated on its pivot said bars will be moved in opposite directions, one pulling and the other thrusting on the guides or outer sides of the shaft, thereby oscillating the shaft 2 and operating the controlling mechanism of the motor. The lever 19 is provided with an enlarged aperture 21, through which the pivot-bolt 20 passes, as shown in Fig. 4, so that any lateral movement of the car that may take place by reason of any lost motion on its guides will not be transmitted to the shaft 2, but said lever 19 may be turned on its pivot to push and pull the shoes 12, as will be understood.

Any suitable means may be provided on



the car for turning the lever 19; but I prefer to employ upon its end a clevis 23, to which is pivoted a link 24 connected to a lever 25 extending up through the floor of the car and in position to be actuated by the operator therein.

In operation it will be understood that it is only necessary for the operator to move the upper end of the lever 25 in one direction or the other, when the motion will be transmitted through the parts just described to the controlling device of the motor, and that by reason of the lateral movement permitted the rods 17 between the guides 18 and of the lever 19 on its pivot any motion of the car due to defective guides will not at all affect the controlling devices. It is not essential that any great amount of motion be permitted the rock-shaft 2; but as the shoes 12 are arranged below the car the guides 5 can be moved close up to the side of the car in operation.

I find in practice that by employing the two guides 5 on opposite sides of the shaft and the actuating-rods 17, as shown, and positively pushing and pulling them longitudinally a better effect is produced than where a single guide is attached to one side of an oscillatory shaft, as my shaft, embodying the central portion and two oppositely-arranged guide portions, is in effect a shaft oblong in cross-section, movable on its vertical axis, and there is less strain on it when the devices on the car are operated.

I claim as my invention—

1. The combination with an oscillatory shaft in an elevator well, adapted to actuate controlling devices, of the elevator car, the two shoes supported on the car and engaging the opposite sides of the oscillatory shaft, the connecting bar to which said shoes are pivoted, and means for oscillating said bar, substantially as described.

2. The combination with an oscillatory shaft in an elevator well, adapted to actuate controlling devices, of the elevator car, the two shoes having a running hold on the opposite sides of the shaft, the connecting bar

to which the shoes are pivoted, and the two actuating rods, and means on the car for moving said rods in opposite directions simultaneously, substantially as described.

3. The combination with an oscillatory shaft in an elevator well, adapted to actuate controlling devices, of the elevator car, the two shoes having a running hold on the opposite sides of the shaft, the connecting bar to which said shoes are pivoted, the actuating rods, the guides on the car loosely supporting the rods, and the pivoted lever connected to the rods, substantially as described.

4. The combination with an oscillatory shaft in an elevator well, adapted to actuate controlling devices, of the elevator car, the two shoes having a running hold on the opposite sides of the shaft, the connecting bar to which said shoes are pivoted, the actuating rods, the pivoted lever for operating them, and a loose connection between the lever and car, substantially as described.

5. The combination with an oscillatory shaft in an elevator well composed of a central portion and two guides on opposite sides thereof, of the elevator car, the two shoes having a running hold on the guides, the connecting bar and actuating rods each rod being connected to its shoe and to the connecting bar by a single pivot, the pivoted lever on the car connected to the actuating rods and permitted a lateral movement on its pivot, substantially as described.

6. The combination with an oscillatory shaft in an elevator-well, composed of a central portion and two guides on opposite sides of the center thereof, and a support in which the central portion of said shaft is journaled intermediate its ends, of the elevator-car, the two shoes mounted thereon and engaging the guides on the shaft, a means on the car for positively pushing and pulling said shoes in opposite directions simultaneously, substantially as described.

FRED B. GRAVES.

Witnesses:

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