

No. 781,366.

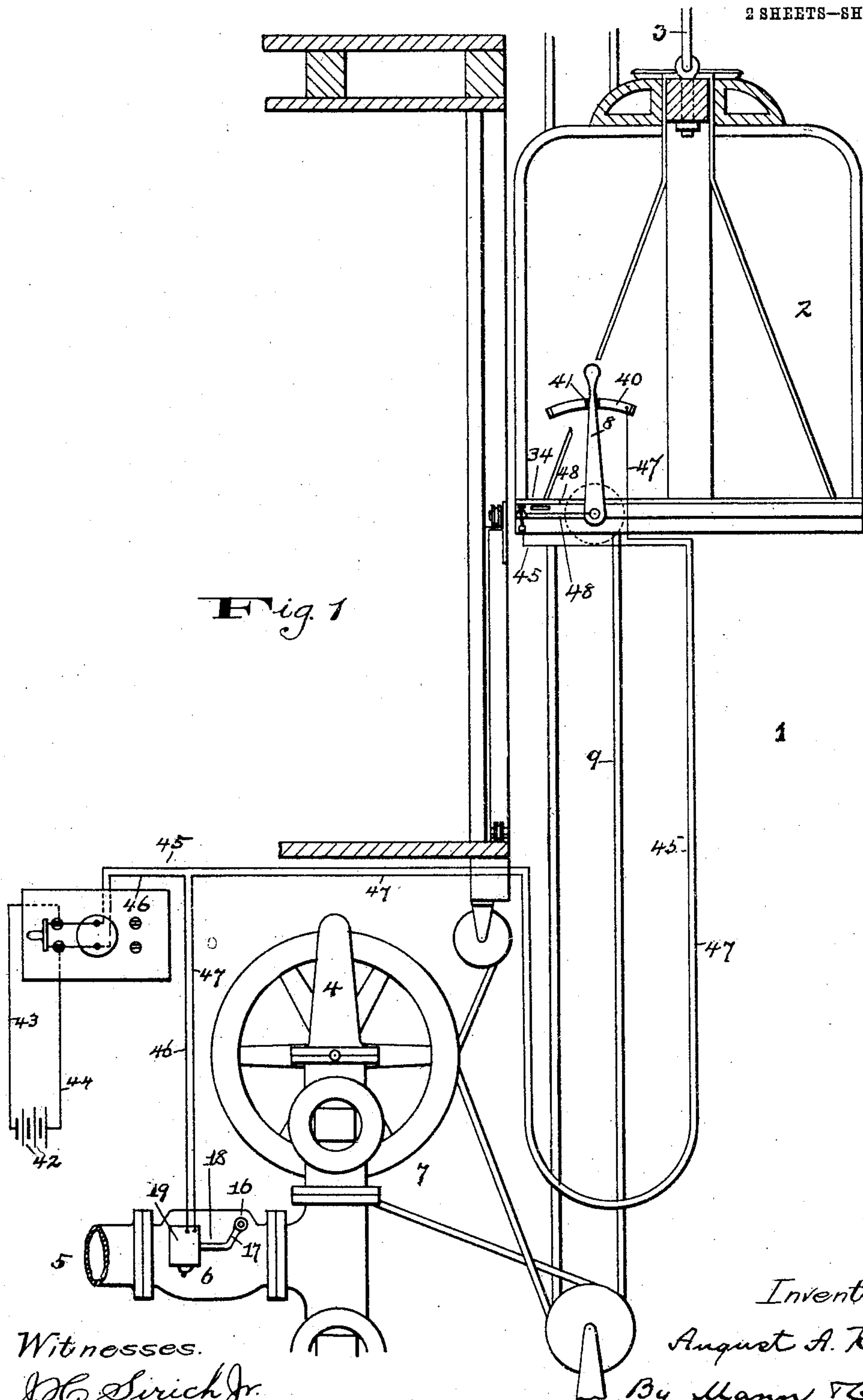
PATENTED JAN. 31, 1905.

A. A. ROTH.

# SAFETY APPLIANCE FOR ELEVATORS.

APPLICATION FILED AUG. 20, 1904.

2 SHEETS—SHEET 1.



*Witnesses.*

J. H. Sirich Jr.  
S. Ferdinand Vogt.

*Inventor.*

August A. Roich

By Mann & Co.

Attorneys

A. A. ROTH.  
SAFETY APPLIANCE FOR ELEVATORS.

APPLICATION FILED AUG. 20, 1904.

2 SHEETS—SHEET 2.

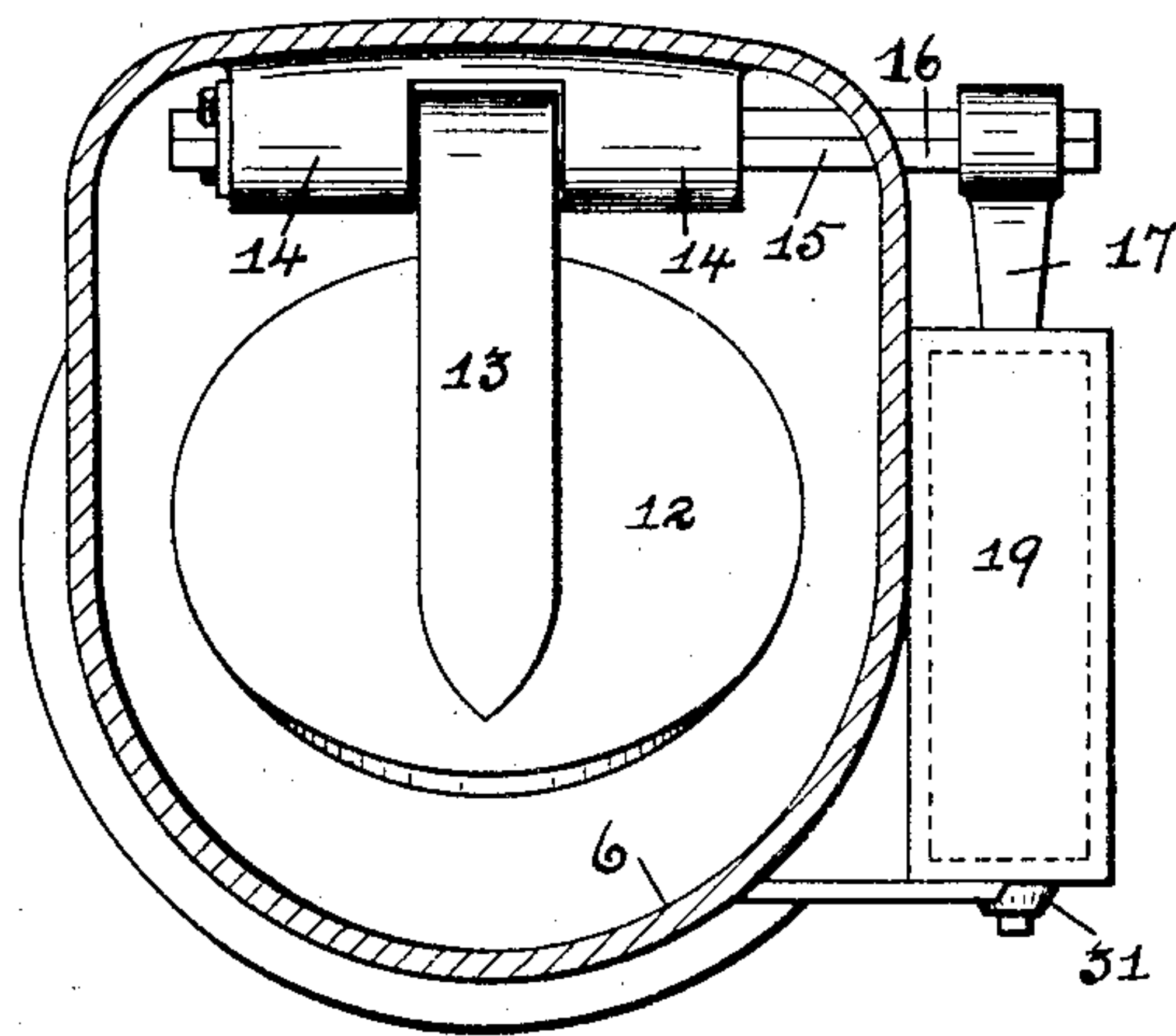


Fig. 2.

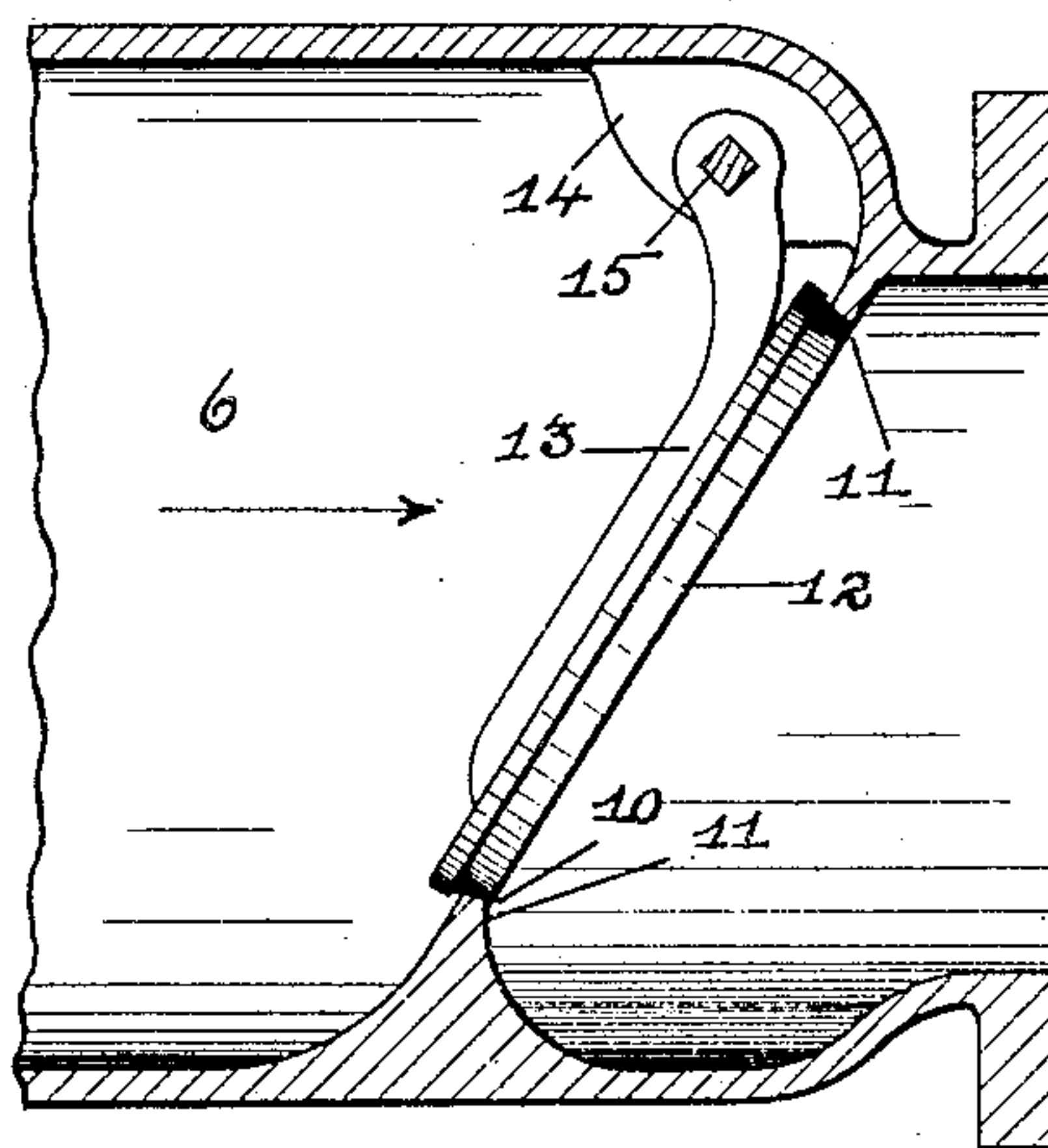


Fig. 3.

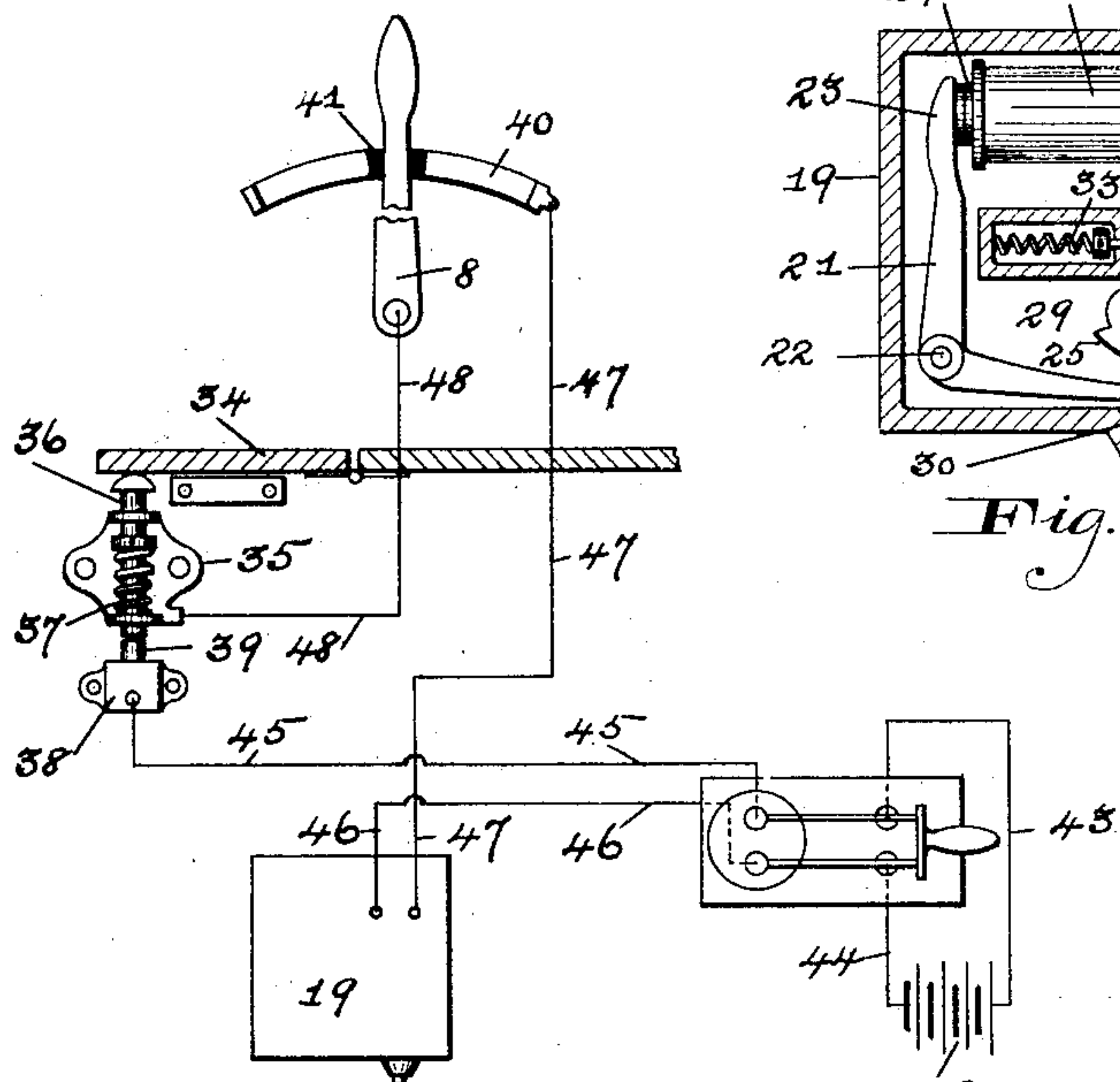


Fig. 4.

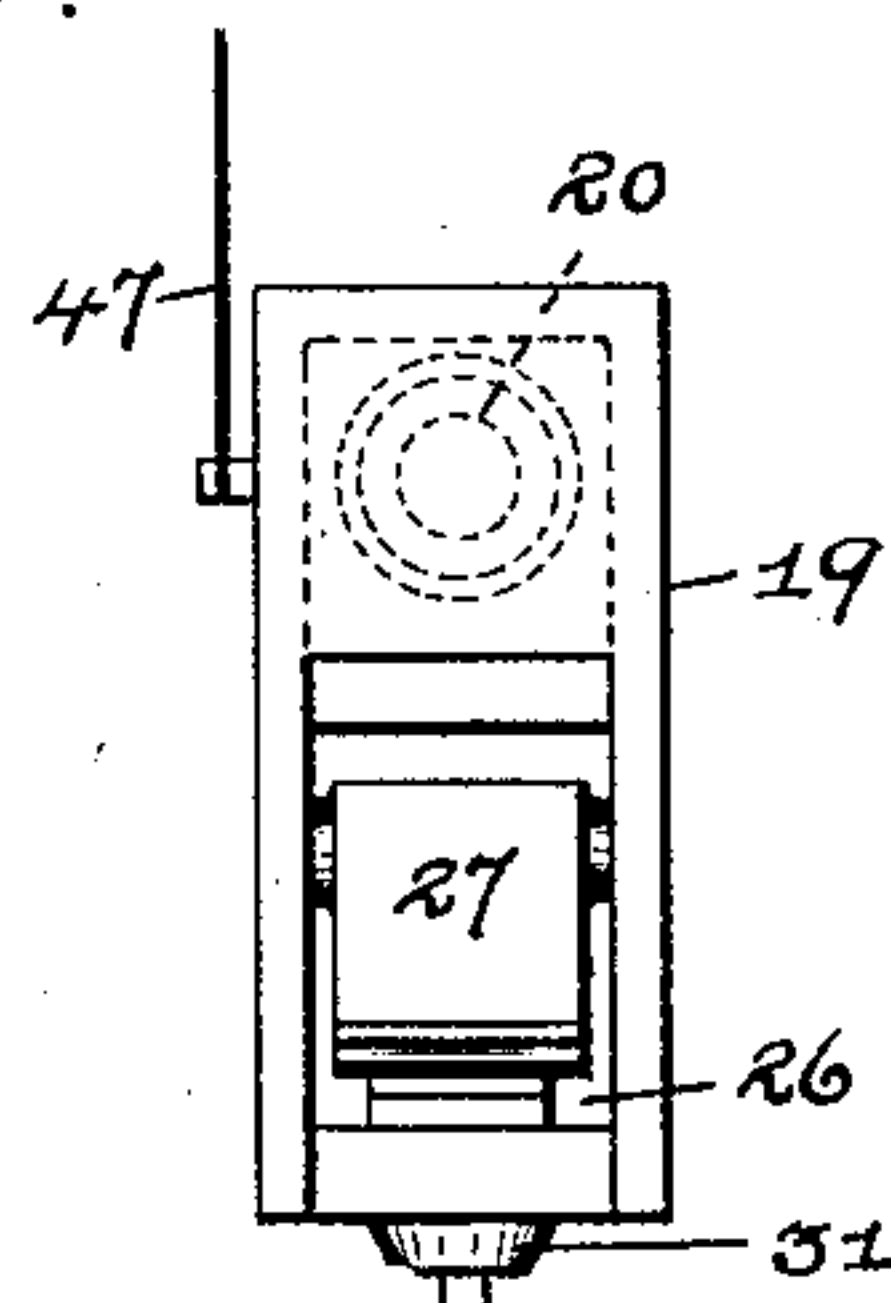


Fig. 5.

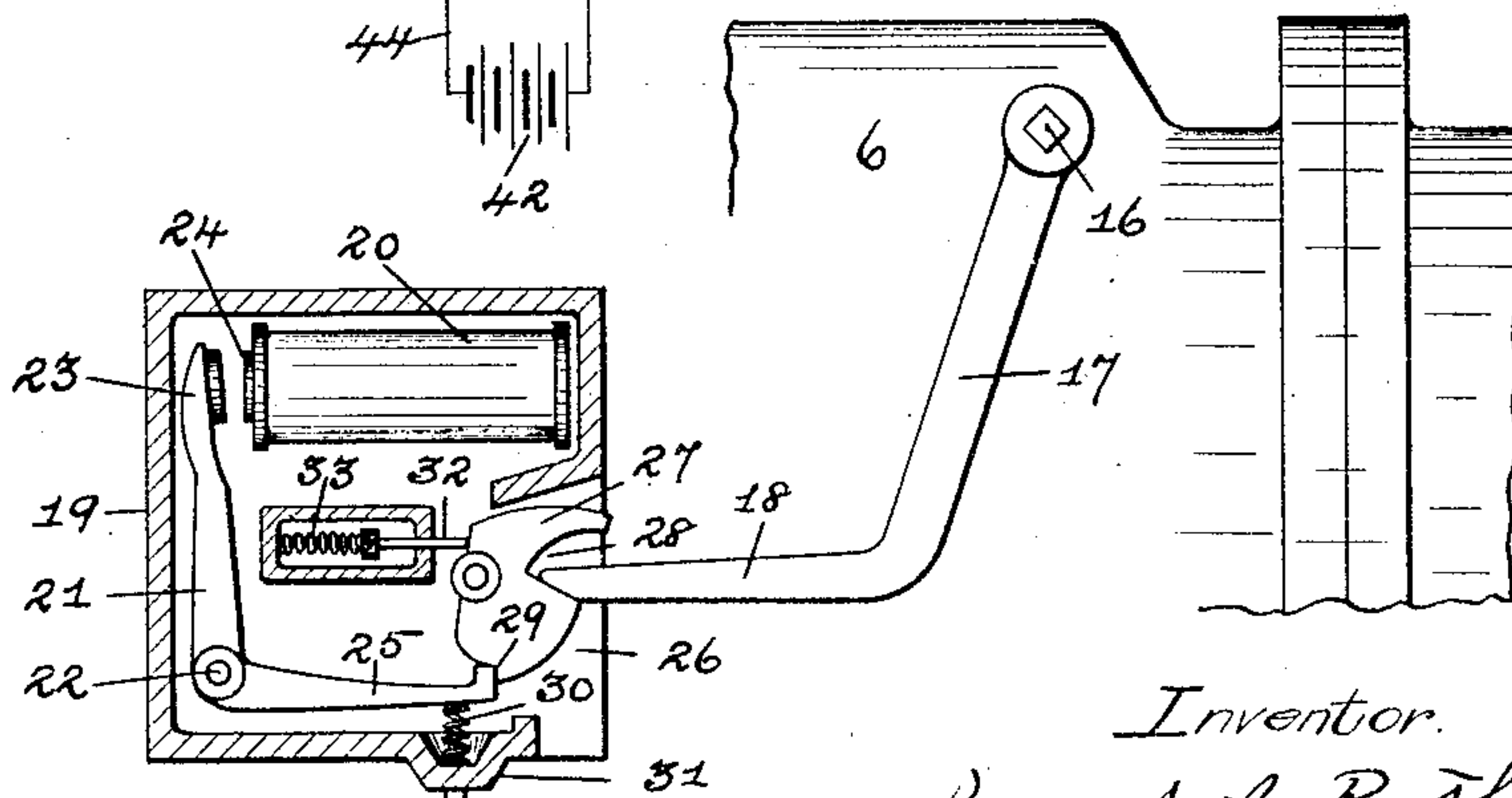


Fig. 6.

Witnesses.  
J. H. Sirich Jr.  
J. Ferdinand Vogt.

Inventor.  
August A. Roth  
By Mann & Co  
Attorneys.



# UNITED STATES PATENT OFFICE.

AUGUST A. ROTH, OF BALTIMORE, MARYLAND.

## SAFETY APPLIANCE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 781,366, dated January 31, 1905.

Application filed August 20, 1904. Serial No. 221,455.

*To all whom it may concern:*

Be it known that I, AUGUST A. ROTH, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Safety Appliances for Elevators, of which the following is a specification.

This invention relates to an automatic safety device for elevators which under certain conditions will automatically operate to cut off the motive power of elevators.

The invention is particularly adapted for use in elevator systems wherein fluid-pressure is employed as the driving agent; and the object of the invention is to provide a device which will automatically operate to prevent the movement of an elevator-car while a passenger is entering or leaving the car.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 illustrates a sectional elevation of an elevator-shaft and the elevator-car therein and also shows a side elevation of a motor device with connections between the car and valve mechanism in accordance with my invention. Fig. 2 illustrates a vertical cross-section through the valve-chamber and shows the valve seated. Fig. 3 shows a vertical longitudinal section through a portion of the valve-chamber, also with the valve closed. Fig. 4 shows a vertical longitudinal section view of the casing containing the electrical mechanism for releasing and retaining the emergency-valve. Fig. 5 illustrates an end elevation of the casing and inclosed mechanism. Fig. 6 illustrates a diagrammatical view of the emergency-valve-operating mechanism. Fig. 7 also shows a longitudinal section of the valve-operating mechanism in position to sustain the arm of the valve to hold the latter open.

Referring to the drawings by numerals, 1 designates an elevator-shaft, and 2 the car, which is suspended by a cable 3 within the shaft. The cable may be sustained in any of the well-known ways by means of suitable pulleys and connected in any practical way to the motor or power mechanism 4. It is also to be understood that this motor mechanism may be of any one of a variety of forms, provided it is to be operated for ordinary service,

such as starting and stopping, by mechanism on the car. The form of motor illustrated in the drawings is of the type designed to be operated by water-pressure. As illustrated in Fig. 1 of the drawings, the motor comprises a supply-main 5, a valve-chamber 6, and valve-operating mechanism 7 for the ordinary service operations in starting and stopping the elevator. The elevator-car 2 is provided with a suitable lever-controller 8, by means of which the cables 9, which extend through the shaft and are connected to the valve-operating mechanism 7, may be actuated to start or stop the motor. The particular construction and operation of all of these devices is immaterial.

It will be observed that the valve-chamber 6 has position between the source of supply, or the force by which the motor is to be actuated, and the ordinary valve mechanism which admits or cuts off that force to or from the motor in the service operation of the car. On the interior this valve-chamber is provided with a port 10, which is surrounded by a valve-seat 11, which latter has an inclined position within the said chamber. An emergency-valve 12 is provided with a center web 13, which projects upwardly beyond the rim edge of the valve and between two downwardly-projecting lugs 14 on the upper interior surface of the chamber. A stem 15 extends through the wall of the valve-chamber 6 and also through the lugs 14 and the upper end of the valve-web 13, so that the valve is pivotally mounted within the chamber and is capable of swinging in a vertical plane. The outer projecting end 16 of the stem 15 carries an arm 17, with a laterally-projecting end 18, which has position at the side of the valve-chamber 6 and by means of which the valve may be held open or allowed to close, as will presently appear. Secured to the exterior side wall of the valve-chamber is a box or casing 19. This casing is provided on its interior (see Fig. 5) with an electromagnet 20, an armature 21 of a bell-crank lever form, which is pivoted at 22, and one arm, 23, of this armature terminates at a point adjacent the core 24 of the magnet, while the other arm, 25, of said armature extends along the bottom to—



ward an opening 26 at one end of said casing. A latch 27 is pivotally mounted within the casing above the end of the arm 25, and said latch is provided at one side with a notch 28.

5 The lower edge of said latch is provided with a shoulder 29, which has position adjacent the end of the arm 25 of said armature. A spring 30 is seated in a cavity 31 in the bottom of the casing, and said spring is slightly compressed

10 between the bottom of the cavity and the outer end of said arm 25 and serves to lightly press said arm up against the edge of the latch. A stem 32 is also mounted on the interior of the casing and is surrounded by a spiral spring

15 33, which serves to press the stem forward against the edge of the latch 27 and above the pivot-point of the latter.

It will be understood that the casing 19 is located at a point on the side wall of the valve-chamber so that its side opening 26 will confront and be in a position to receive the free end 18 of the arm 17 and permit said free end to be inserted in the notch 28 of the latch 27 to hold the emergency-valve 12, as will presently be fully explained. It is deemed advisable at this point to state that the present invention is particularly useful in preventing accidents caused by a premature starting of the car by the operator while a passenger is entering or leaving the car, and by means of the present invention the very act of operating the controller-lever 8 prematurely will cause the motive power to be cut off, so that while the ordinary service-valves will be operated as usual their

20 operation will not have any effect on the motor, because the power will have been cut off at a point between the source of supply and the service-valves.

One form of mechanism to coact with the emergency-valve device to automatically cut out the motor will now be described; but it is to be understood that the invention is not to be limited to the form described.

At the entrance to the elevator-car 2 the floor of the latter is provided with a hinged or yielding section 34, on which every person upon entering or leaving the car must step, as clearly illustrated in Fig. 6. Beneath the yielding section 34 of the car-floor is a bracket 35, which supports a stem 36, and this stem is pressed upwardly beneath the yielding section of the car-floor by means of a spiral spring 37. Beneath the bracket 35 and also attached to the car-frame is a bracket

45 38, provided with a projecting pin 39, which has position directly beneath the lower end of the stem 36. It is obvious that when a person steps on the yielding section 34 of the car the stem 36 will be depressed until the lower end contacts with the pin 39. This contact of the stem and pin in the form of device illustrated is to be utilized to operate the emergency-valve, provided the operator accidentally shifts the controller-lever while

50 said stem and pin are in contact.

At the side of the lever-controller 8 and secured in any suitable manner is a segment contact-plate 40, against which the side of the lever contacts. This plate 40 midway between its ends is provided with an insulating-block 41, against which the lever-controller rests when in the cut-off position; but when the lever is in the operating position at either side of the insulating-block it is in contact with the said plate 40.

The operation of the emergency-valve 12 is to be effected through the medium of an electric current, as will now be described.

Located at a convenient place and in the present instance near the motor mechanism is a generator or storage batteries 42, from which the usual conductors 43 and 44 lead in the present instance to a switch. From this switch a wire 45 leads to the bracket 38 and pin 39. A wire 46 also leads from the switch and connects with the magnet 20 in the casing 19 at the side of the valve-chamber 6. A wire 47 leads from the magnet 20 up through the elevator-shaft and connects with the segment-plate 40, and a wire 48 extends from the pivot-point of the controller-lever 8 and connects with the bracket 35 and stem 36. It will thus be seen that electrical connection may be made between the switch, magnet 20, bracket 38, pin 39, stem 36, bracket 35, lever-controller 8, segment-plate 40, and again to the switch. It will be noted that in the circuit as just described there are two breaks—one between the pin 39 and stem 36 and one between the controller-lever 8 and the insulating-block 41. By this construction when the elevator is at rest and the lever 8 in contact with the block 41 the yielding floor-section 34 may be depressed by the weight of a person who may be entering or leaving the car without establishing the circuit when the stem 36 and pin 39 are in contact, because the circuit is broken between the lever and segment-plate 40; but if a person is partly on the yielding section 34 and contact is made between the stem 36 and pin 39 and the operator prematurely moves the lever to start the car, immediately contact is made between the lever and segment-plate 40 the circuit will be established, the magnet 20 in the casing 19 will become energized and attract the arm 23 of the armature, release the arm 25 from behind the shoulder 29 of the latch 27, and permit the latch to tilt, and thereby release the end 18 of the arm 17 and permit the emergency-valve 12 to drop and close the port in the valve-chamber. It will be noted that the valve 12 closes with the pressure and when released will instantly cover the port 10.

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

1. The combination with an elevator-car of a motor for moving the car; means on the car for ordinarily operating the motor mechan-



ism to start and stop the car; an emergency device independent of the motor and operating only in cases of emergency to render the motor inoperative, and means coacting between the emergency device and the operating means on the car whereby the premature operation of the latter will cause the emergency device to be operated.

2. The combination with an elevator-car, of a fluid-operated motor for moving the car; valve mechanism for controlling the passage of fluid to the motor for ordinary service; valve-operating mechanism on the car; an emergency-valve for operation only in cases of emergency to cut off the passage of the fluid to the motor-valve mechanism; means for normally keeping the emergency-valve in the open position during the ordinary operations of the motor-valve mechanism, and means coacting between the emergency-valve and the operating mechanism on the car whereby the premature movement of the latter will effect the closing of the emergency-valve.

3. The combination with an elevator-car, of a fluid-operated motor; valve mechanism for controlling the motor movable at all times; controller means on the car for operating the motor-valve mechanism; a valve-chamber between the fluid-supply and the motor-valve mechanism; an emergency-valve in said chamber; a latch device on the exterior of said chamber for holding the emergency-valve open during the ordinary operations of the motor-valve mechanism; means for electrically connecting the latch with the controller means on the car, and means also on the car and in electrical connection with the controller and latch and operated by a person entering or leaving the car whereby to release the emergency-valve upon the premature operation of the controller.

4. The combination with an elevator-car, of a fluid-motor; motor-valve mechanism; a controller on the car which is always capable of operation; a valve-chamber between the fluid-supply and motor-valve mechanism; an emergency-valve in said chamber; a latch to hold the emergency-valve open; a lever to engage said latch; an electromagnet; an electric circuit including the controller on the car and the electromagnet, and an emergency circuit-closer also on the car and in circuit with the controller and electromagnet, said circuit-closer being operated by a person entering or leaving the car and coacting with the controller, upon the premature operation of the latter to close the circuit and release the emergency-valve at the moment of the emergency.

5. The combination with an elevator-car, of a fluid-operated motor; valve mechanism for controlling the passage of fluid to the motor in ordinary service-work; means on the car for actuating said valve mechanism; an emergency-valve independent of the motor and operated only in cases of emergency; means for holding the emergency-valve in an inoperative position during the ordinary operations of the actuating means on the car; an electric circuit including the actuating means on the car and the means for holding the emergency-valve, and a device also in the circuit with the actuating device on the car, whereby the operation of one device while the other is in the operated position will effect the closing of the emergency-valve.

6. The combination with an elevator-car, of a fluid-operated motor for moving the car; valve mechanism for controlling the passage of fluid to the motor for ordinary service; means on the car for actuating the motor-valve mechanism at all times; an emergency-valve to cut off the passage of fluid to the motor-valve only at times of emergency; mechanical means for normally holding the emergency-valve open during the ordinary operations of the motor-valve mechanism; an electric circuit including the mechanical valve-holding means and the actuating means on the car, and means also in the circuit and arranged to be operated by a person entering or leaving the car whereby to release the emergency-valve only upon the premature operation of the actuating mechanism in the car.

7. The combination with an elevator-car, of a fluid-operated motor; valve mechanism for controlling the passage of fluid to the motor for ordinary service; a valve-chamber between the fluid-supply and the motor-valve mechanism; an emergency-valve in said chamber; means on the exterior of the chamber for closing the emergency-valve only in cases of emergency; means for holding said closing means to keep the emergency-valve open during the ordinary operations of the motor-valve; means on the car for actuating the motor-valve mechanism; and means coacting between the closing device of the emergency-valve and the actuating means on the car whereby to close the emergency-valve upon the premature operation of said actuating means.

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

AUGUST A. ROTH.

Witnesses:

CHARLES B. MANN, Jr.,  
FELIX R. SULLIVAN.