

No. 610,256.

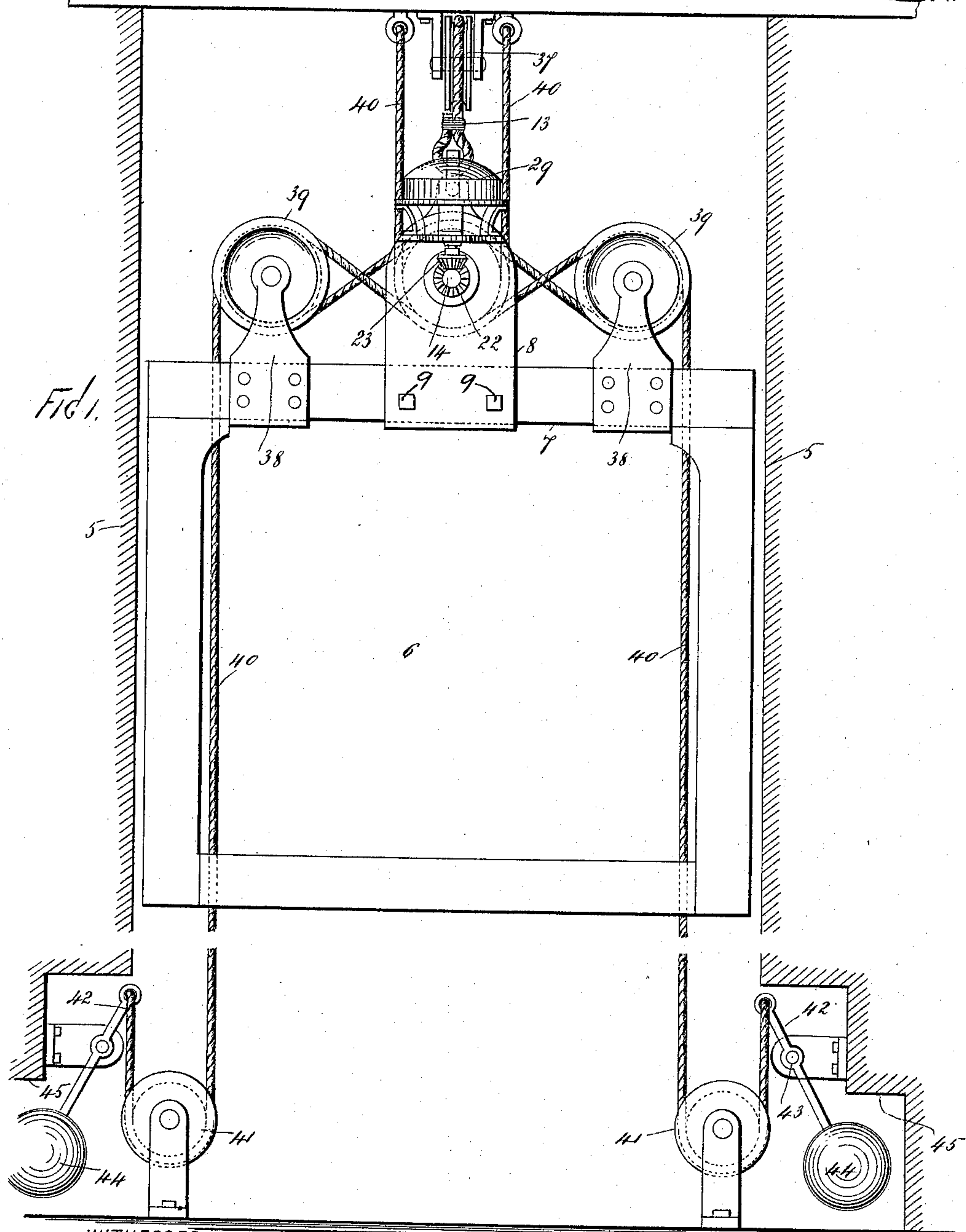
Patented Sept. 6, 1898.

G. BROWN.
ELEVATOR BRAKE.

(Application filed May 26, 1898.)

(No Model.)

~~3 Sheets—Sheet 1.~~



WITNESSES

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FIG. 2.

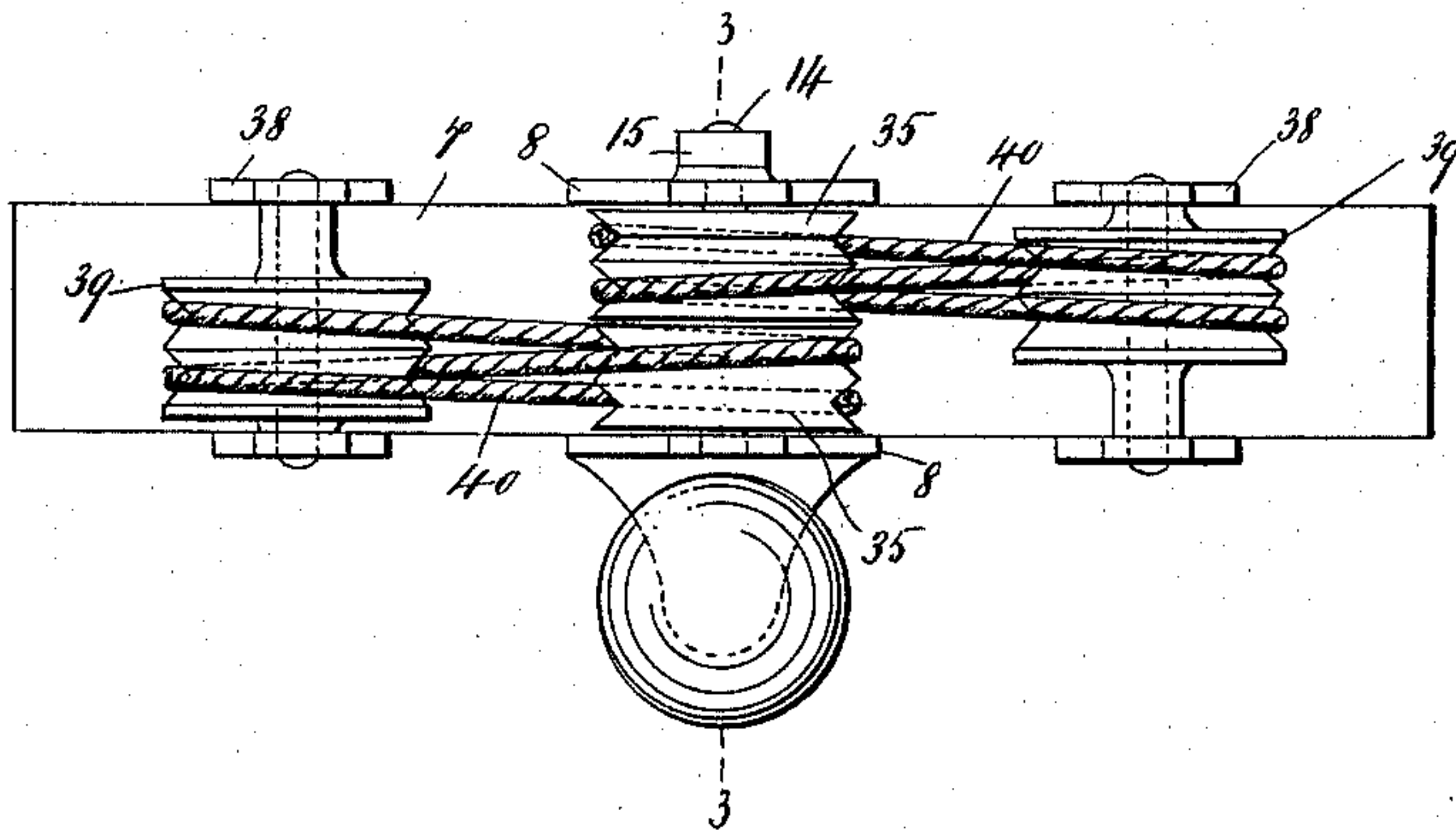
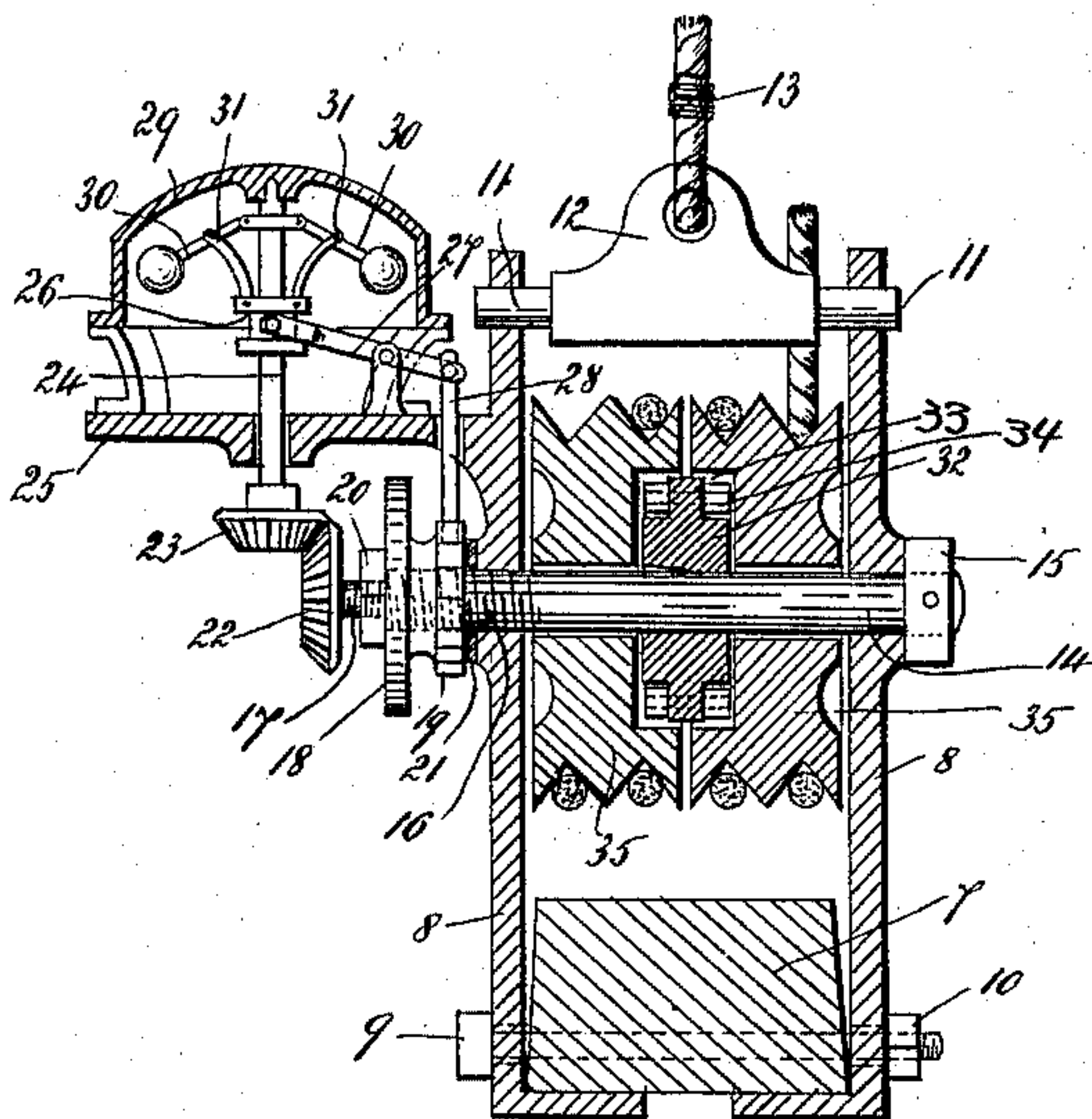


FIG. 3.



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FIG. 4.

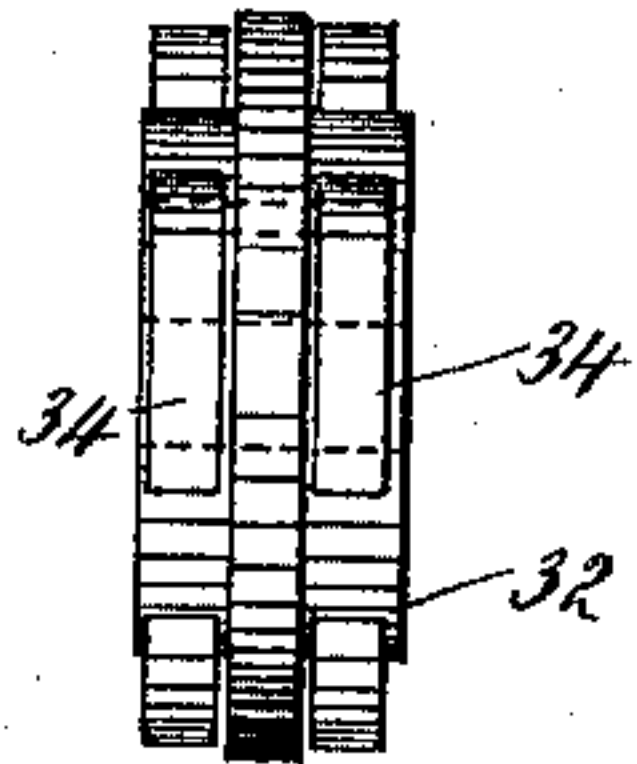


FIG. 5.

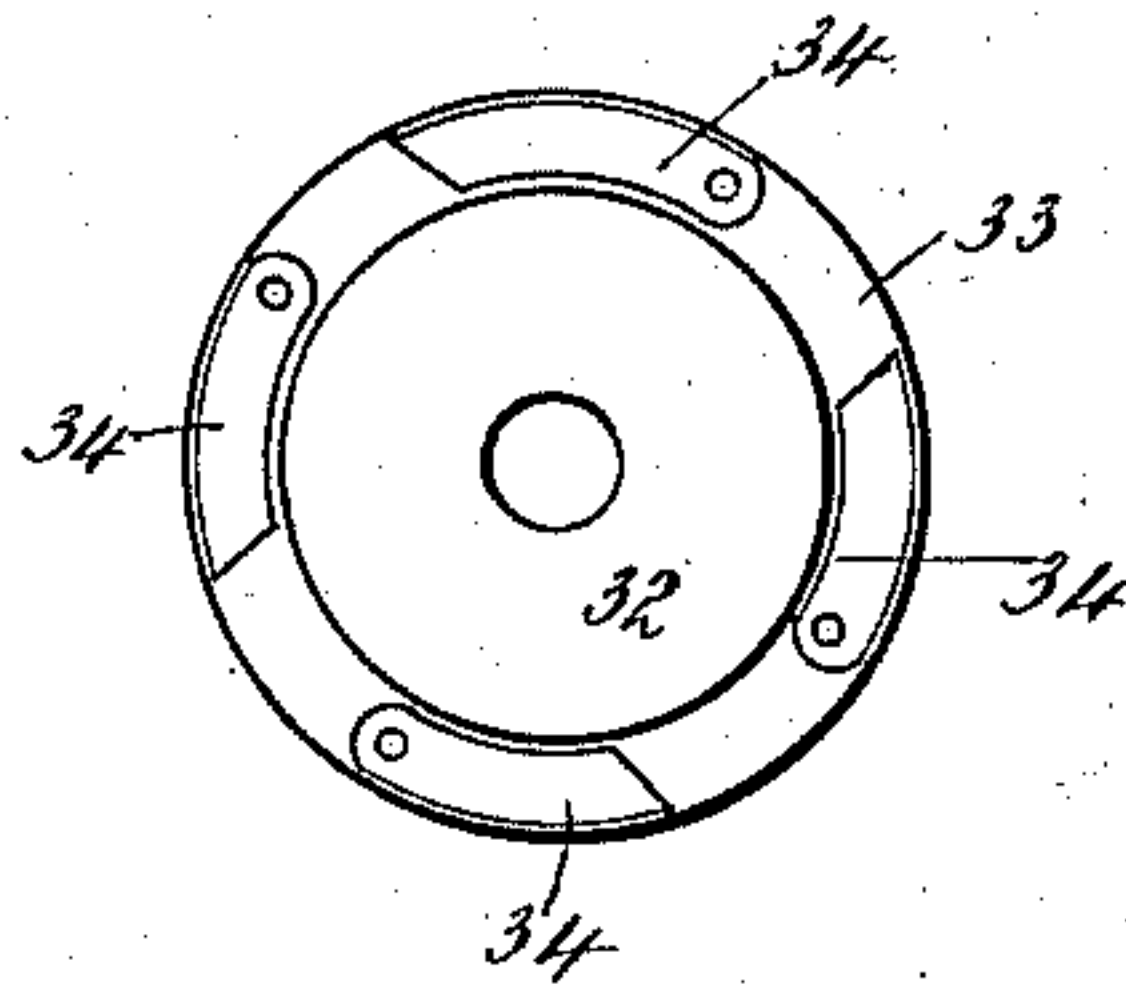


FIG. 6.

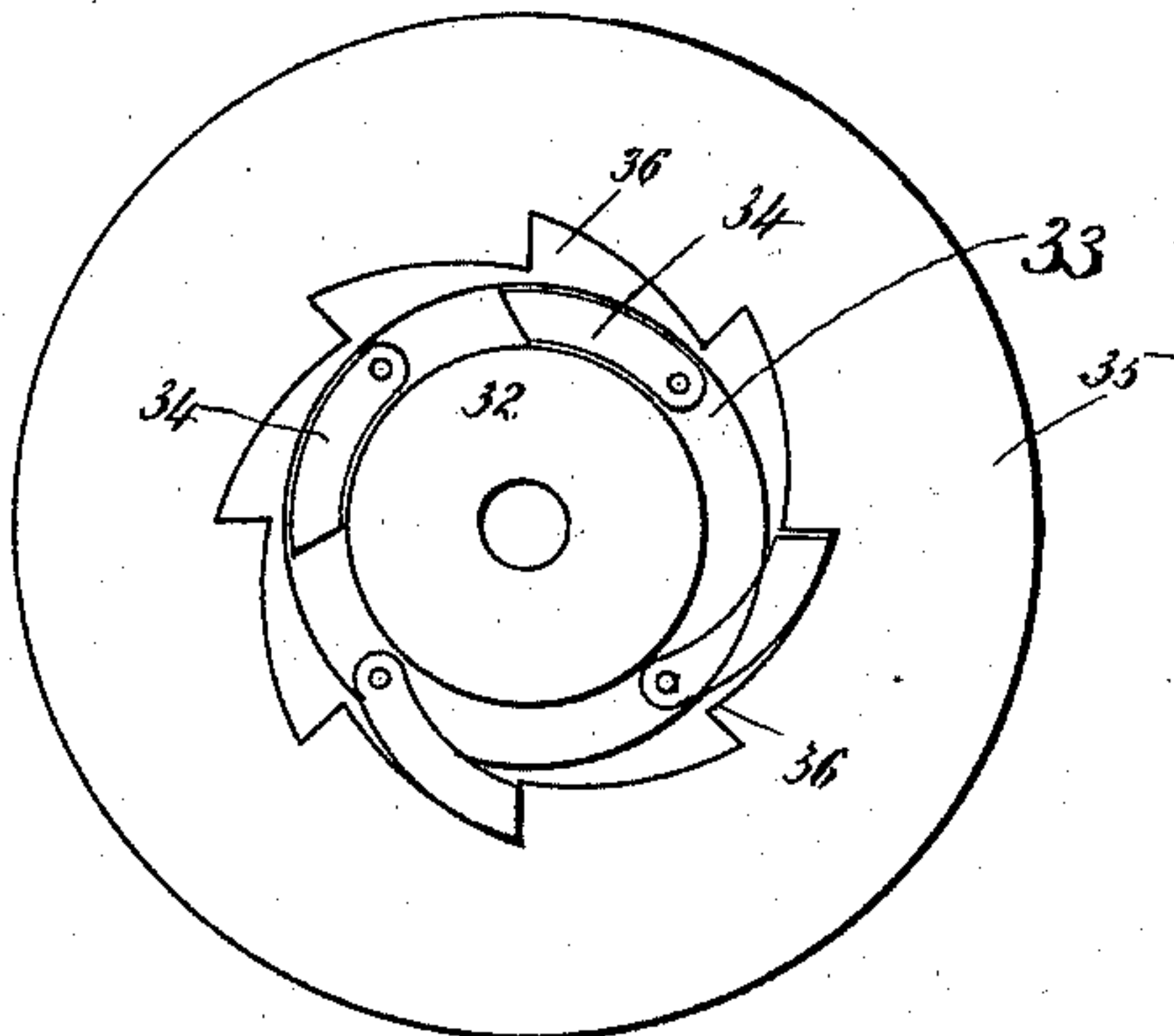


FIG. 7.

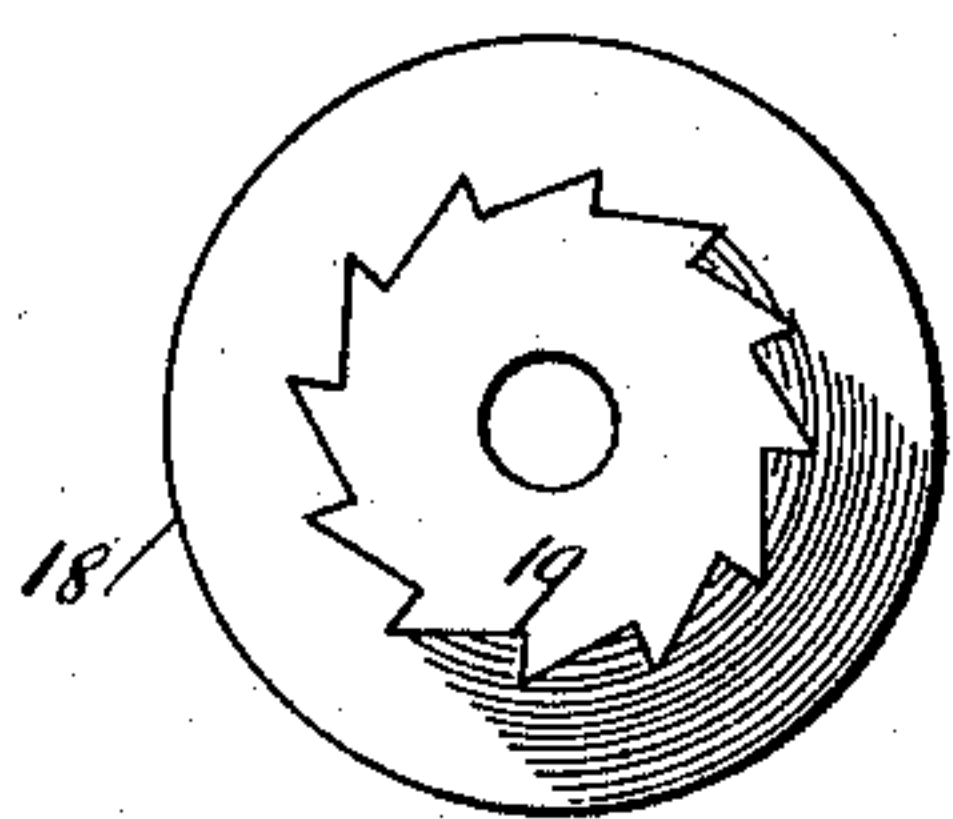
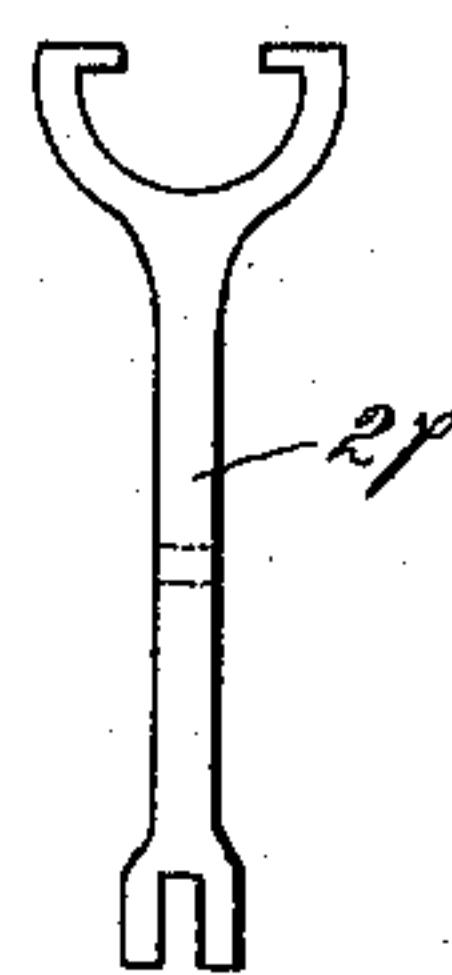


FIG. 8.



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UNITED STATES PATENT OFFICE.

GEORGE BROWN, OF NEW YORK, N. Y.

ELEVATOR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 610,256, dated September 6, 1898.

Application filed May 26, 1898. Serial No. 681,820. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BROWN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Elevator-Brakes, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to elevators; and the object thereof is to provide an elevator-car with improved suspending devices and an improved stop or brake mechanism, whereby the elevator will be held and the dropping or falling thereof prevented in case the main suspension-cable, by which it is raised and lowered, should break or be disconnected therefrom.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a side view of an elevator-car provided with my improvement and showing parts of the side walls of the elevator-shaft; Fig. 2, a plan view of the brake mechanism which I employ; Fig. 3, a partial section on the line 3 3 of Fig. 2; Fig. 4, an edge view of a locking-disk which forms a part of my improved brake mechanism; Fig. 5, a side view thereof; Fig. 6, an inside view of one of a pair of double pulleys which form a part of said brake mechanism and showing the locking-disk mounted therein; Fig. 7, a side view of a wheel provided with a ratchet-hub, which also forms a part of said mechanism; and Fig. 8, a side elevation of a lever which also forms a part of said mechanism.

In the drawings forming part of this specification the same parts of my improvement are designated by the same numerals of reference in all of the views, and in said drawings I have shown at 5 the opposite side walls of an elevator-shaft and at 6 an elevator-car mounted therein, and said elevator-car is provided with a top cross-beam 7, which forms a part of the frame thereof, and this cross-beam 7 is preferably of the form in cross-section shown in Fig. 3, the side walls thereof being inwardly and upwardly inclined.

Connected with the cross-beam 7 are two

vertical side plates 8, said plates being connected with said beam by bolts 9, each provided at one end with a nut 10, and the upper ends of said plates are provided with circular holes, through which are passed trunnions 11, formed on the opposite ends of the block 12, with which the main suspension-cable 13 for raising and lowering the car is connected.

The upper ends of the side plates 8 are adapted to move slightly on the trunnions 11, and passing centrally through said side plates is a shaft 14, which is provided at one end with a head 15 and which is screw-threaded at the opposite end, as shown at 16.

The screw-threaded end of the shaft 14 projects beyond the adjacent side plate 8 and is provided with a reduced extension 17, and mounted on the screw-threaded portion of the shaft 14 is a wheel 18, having an inwardly-directed ratchet-hub 19, and the screw-thread on the reduced extension 17 of the shaft 14 is the reverse of that on the shaft, and mounted thereon is a set-nut 20, which is intended to hold the wheel 18 in place, and between the hub 19 and the plate 8 is preferably placed a washer 21. The extension 17 of the shaft 14 is also provided with a beveled pinion 22, which operates in connection with a beveled pinion 23, secured to the lower end of a shaft 24, which passes through a horizontal bracket or support 25, formed on or secured to the adjacent plate 8, and the upper end of said shaft 24, above said bracket or support, is provided with a sliding collar 26, with which is connected a lever 27, the outer end of which projects in the direction of the adjacent plate 8 and is pivotally connected with a vertically-movable bar 28, which passes downwardly through the bracket or support 25 and the lower end of which is adapted to operate in connection with the ratchet-hub 19 of the wheel 18.

Supported above the bracket or support 25 is a dome-shaped cap 29, in which the upper end of the shaft 24 is pivoted, and said shaft is provided with an ordinary governor, consisting of the pivoted weighted arms 30, which are connected with the collar 26 by supplemental pivoted arms 31, and the operation of this device will be hereinafter described.

Mounted centrally on the shaft 14 and rig-

idly secured thereto in any desired manner is a locking-disk 32, (shown in Figs. 3, 4, and 5,) and said locking-disk is provided at each side with a peripheral groove 33, in each of which is pivoted a plurality of dogs 34, which are preferably four in number, and said dogs on both sides of said disk project in the same direction, and mounted on said shaft 14, at each side of the locking-disk 13, is a double pulley 35. These pulleys 35 are exactly of the same form and construction, and each is provided in its inner face with an annular space forming an annular chamber in which the locking-disk 32 is placed, and said pulleys 35 are also each provided around said annular space with a plurality of tangential teeth 36, and these teeth in both of said pulleys project in the same direction.

The main suspension-cable 13 is passed over a pulley 37, supported at the top of the elevator-shaft, and said cable is carried from said pulley to a drum suitably located at the bottom of the shaft in the usual manner, said drum being not shown, this arrangement being similar to that usually employed for raising and lowering an elevator-car.

Mounted at the opposite sides of the support, consisting of the plates 8 and other connected parts, are two brackets or supports 38, which are secured to the cross-beam 7 or connected therewith in any desired manner and which are preferably yoke-shaped in form, and mounted in each of these supports is a double pulley 39, one of which is arranged in the same vertical plane as one of the pulleys 35 and the other in the same vertical plane as the other pulley 35, and I also employ two cords or cables 40, which are permanently secured to a suitable support at the top of the elevator-shaft, and one of these cords or cables 40 is passed downwardly to the left of and beneath one of the double pulleys 35, and around said pulley, and then above and around the pulley 39 at the right thereof, and then over and around said pulley 35, and then over and around the said pulley 39, and downwardly through the elevator-shaft, and preferably through the elevator-car and around the pulley 41 in the bottom of the elevator-shaft, and the end thereof is connected with one end of a lever 42, which is pivotally supported at 43, and the opposite end of which is provided with a weight 44, and I also provide means to limit the upward movement of said weight, which, as shown in the drawings, consists of a shoulder or projection 45, formed in or on the side wall of the elevator-shaft, but any suitable means may be provided for this purpose. The other cord 40 after being secured at the top of the elevator-shaft, as described, is passed downwardly to the right of and partially around the other pulley 35, then over and around the pulley 39 at the left, then over and around said pulley 35, and then back over and around said pulley 39, and is carried downwardly to the bottom of the elevator-shaft, where it is passed around a correspond-

ing pulley 41 and connected with a lever 42, as hereinbefore described with reference to the other cord or cable 40.

By means of this construction it will be seen that the elevator-car while being supported by the cable 13 moves on the cords or cables 40, and said cords or cables pass freely around the pulleys 35 and 39 as the car rises and descends, and the cords or cables 40 are kept taut by the levers 42, and the lower ends of said cords or cables are yieldingly supported, so as to provide for sudden jerks or jars occasioned by the starting or stopping of the car in the operation thereof, the lower ends of said cords or cables being capable of a slight upward movement, which is limited by the stops with which the weights 44 of the levers 42 come in contact; but in the normal position of these parts said levers occupy the position shown in Fig. 1, and the cords or cables 40 are held taut thereby.

In the operation of the car the pulleys 35 revolve constantly in opposite directions as the car rises and descends, and one of these pulleys is always locked in connection with the locking-disk 32 by means of the pivoted dogs 34, which operate in connection with the teeth 36, formed in said pulleys, and one of said pulleys is locked in connection with said locking-disk as the car ascends and the other as it descends. In this operation the shaft 14 is always revolved in one direction or to the right, and if at any time the suspending-cable of the car should be broken or disconnected and the car should start to fall, or if by any reason the car should at any time be drawn upwardly too fast, the shaft 14 would be turned so quickly that the governor would be operated by the gear-wheels 22 and 23, and the pivoted arms 30 of said governor would be thrown upwardly and the bar 28 downwardly, so that the lower end thereof would engage with the ratchet-hub. This would prevent the revolution of the wheel 18 with the shaft 14, and said shaft would be forced through said wheel by reason of its screw-threaded connection therewith, and the hub of said wheel would be pressed upon the adjacent plate 8, and the separate plates 8 would be drawn together and by a friction on the pulleys 35 prevent the revolution thereon, and this would operate as a brake to stop the car.

In the normal operation of the parts the governor is not revolved with sufficient rapidity to depress the bar 28 and the brake mechanism does not work; but said brake-governor is instantly thrown into operation if the suspending-cable of the car should break or be detached therefrom or if for any reason the car should be drawn upwardly too rapidly.

My improved brake mechanism for elevator-cars is simple in construction and perfectly adapted to accomplish the result for which it is intended, and it will be apparent that changes in and modifications of the construction herein described may be made with-

out departing from the spirit of my invention or sacrificing its advantages.

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

1. An elevator-car provided with the usual suspending-cable by which it is raised or lowered, and a brake mechanism, comprising two vertical plates secured to the top of the elevator-car, a brake-shaft passing therethrough, two double pulleys mounted on said shaft and adapted to revolve in opposite directions, means for locking either of said pulleys to said shaft, a governor connected with said shaft, a threaded wheel mounted on the end of said shaft adjacent to one of said plates, and provided with a ratchet-hub, a locking-bar connected with said governor and operating in connection with said hub, two other double pulleys mounted on opposite sides of said first-named pulleys, and two supplemental cords or cables which are connected with a suitable support at the top of the shaft, and passed around the pulleys on the brake-shaft, and the pulleys at the opposite sides thereof, said supplemental cables being also carried downwardly to the bottom of the shaft and provided with yielding connections, substantially as shown and described.

2. The combination with an elevator-car provided with a cable by which it is raised and lowered, of a brake mechanism, comprising two supplemental cables secured at the top of the elevator-shaft and provided with suitable connections at the bottom thereof, a brake-shaft mounted in yielding side plates at the top of the car, two double pulleys mounted thereon, and adapted to revolve in opposite directions, one or the other of said pulleys being always locked in connection with said shaft, other pulleys mounted on the opposite sides of the pulleys on the brake-shaft, a screw-threaded wheel mounted on one end of said shaft provided with a ratchet-hub, said wheel being adapted to be forced against one of said plates, and a governor in operative connection with said shaft and provided with a vertically-movable bar which is adapted to operate in connection with said ratchet-hub, substantially as shown and described.

3. In a brake mechanism for elevator-cars constructed as herein described, the combination of two yielding plates, a brake-shaft passing therethrough, two double pulleys mounted on said shaft and adapted to be locked in connection therewith, one end of said shaft being screw-threaded and provided with a screw-threaded wheel which is adapted to be forced against one of said plates, and a governor geared in connection with said end of said shaft and provided with a verti-

cally-movable locking-bar, which is adapted to operate in connection with said wheel, substantially as shown and described.

4. A brake mechanism for elevator-cars constructed as herein described, and comprising two yielding plates, a brake-shaft passing therethrough, two pulleys mounted on said shaft and adapted to revolve in opposite directions, one end of said shaft being screw-threaded and provided with a screw-threaded wheel which is adapted to be forced against one of said plates, and a governor geared in connection with said end of said shaft, and adapted to operate in connection with said wheel, and two supplemental cables which are connected with a support at the top of the elevator-shaft and passed around said pulleys, said cables being carried downwardly to the bottom of the shaft and provided with yielding connections, substantially as shown and described.

5. A brake mechanism for elevator-cars comprising two yielding plates secured at the top thereof, a brake-shaft passing therethrough, a governor in operative connection with the end of said shaft, a screw-threaded wheel, mounted on the screw-threaded end of said shaft, means connected with said governor for preventing the revolution of said wheel, two double pulleys mounted on said shaft and adapted to be locked in connection therewith, and supplemental cords or cables supported at the top of the elevator-shaft and passed around said pulleys, substantially as shown and described.

6. A brake mechanism for elevator-cars comprising two yielding plates secured at the top thereof, a brake-shaft passing therethrough, a governor in operative connection with the end of said shaft, a screw-threaded wheel mounted on the screw-threaded end of said shaft, means connected with said governor for preventing the revolution of said wheel, two double pulleys mounted on said shaft and adapted to be locked in connection therewith, and supplemental cords or cables supported at the top of the elevator-shaft and passed around said pulleys, said car being also provided with supplemental pulleys on the opposite sides of the pulleys mounted on the brake-shaft and around which said supplemental cords or cables are also passed, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 23d day of May, 1898.

GEORGE BROWN.

Witnesses:

F. A. STEWART,
A. C. McLOUGHLIN.