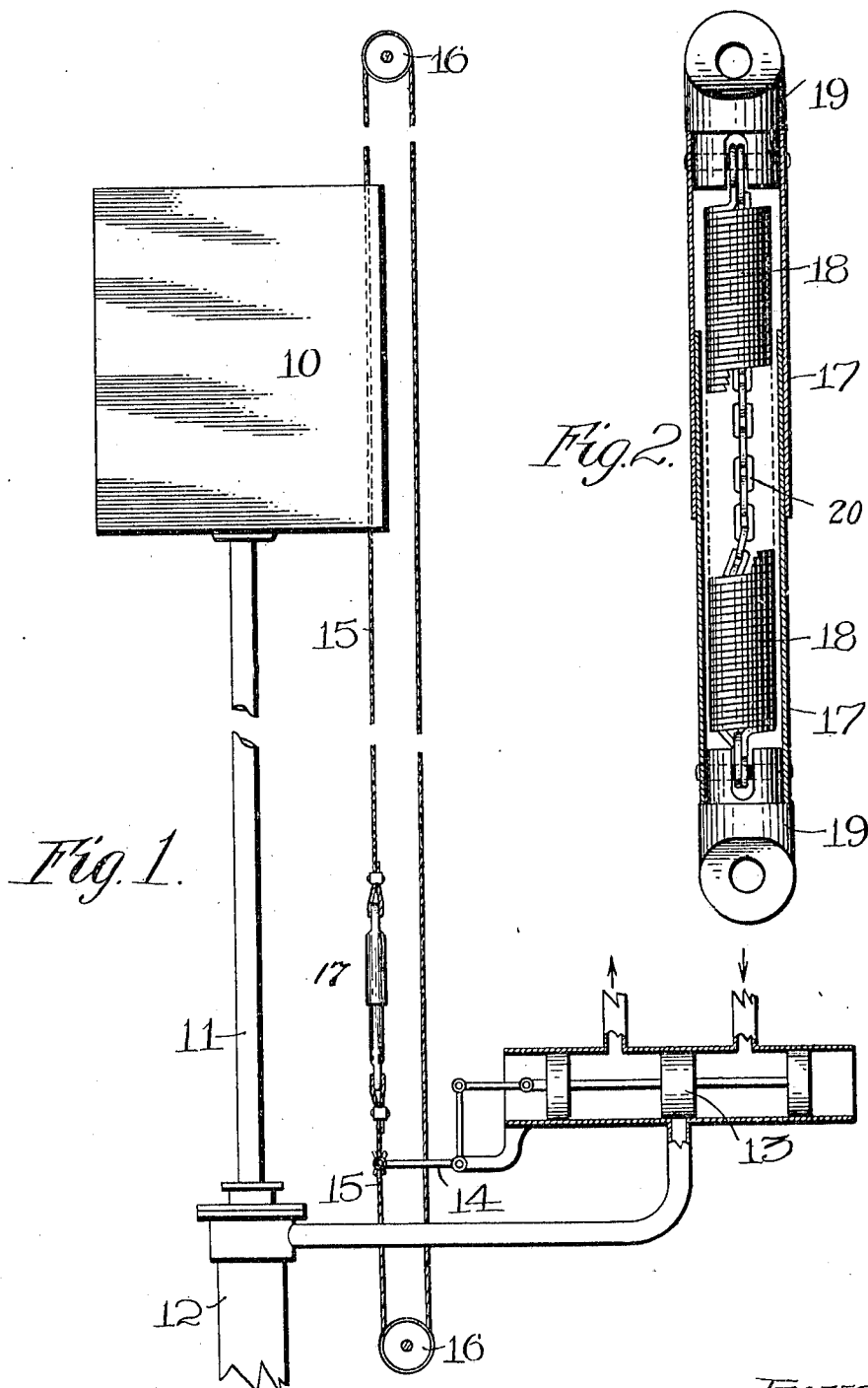


M. J. HOY.
ELEVATOR SAFETY DEVICE.
APPLICATION FILED MAR. 18, 1909.

949,274.

Patented Feb. 15, 1910.



Witnesses:
C. F. Wilson
C. M. Allen.

Inventor:
M. J. Hoy.
By Attorneys:
Southgate & Southgate

UNITED STATES PATENT OFFICE.

MICHAEL J. HOY, OF WORCESTER, MASSACHUSETTS.

ELEVATOR SAFETY DEVICE.

949,274.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed March 18, 1909. Serial No. 484,241.

To all whom it may concern:

Be it known that I, MICHAEL J. HOY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Elevator Safety Device, of which the following is a specification.

This invention relates to a safety device for elevators, particularly plunger elevators.

It is common experience in plunger elevator practice that when an elevator is stopped at a floor and left for a long period, it will frequently creep either up or down. This is generally ascribed to faulty construction or wearing of the valves which control the flow of water to and from the cylinder; in fact when this state of affairs exists inspectors of elevators generally specify that the valves must be overhauled. This condition is not only objectionable on account of the fact that the leaking of water to and from the cylinder results in a loss of water but it is extremely dangerous and has been responsible for many a fatal accident. It is also found that the operating cables or ropes which control the main valve sometimes break in practice when it does not appear that they have been worn out sufficiently to cause them to give way.

It is the principal object of this invention to overcome both creeping of the elevator under the conditions above mentioned and the breakage of the cable except when it wears out from long continued use.

It is also an object of this invention to provide an exceedingly simple and inexpensive construction for accomplishing this result.

Further objects and advantages of this invention will appear hereinafter.

Reference is to be had to the accompanying drawing in which,

Figure 1 is a side elevation somewhat diagrammatic in form of a plunger elevator and a portion of its operating mechanism, and Fig. 2 is a vertical central sectional view on enlarged scale of the safety device shown in Fig 1.

The invention is illustrated as applied to a well known type of plunger elevator in which the car 10 is mounted on a plunger 11 working in a cylinder 12 which is controlled by a main valve 13. This main valve is provided with a stem which is operated by a lever 14 connected with the operating rope or cable 15. In practice, this flexible connection 15 which operates the main valve

is generally in the form of a cable which consists of a core of Manila rope surrounded by a plurality of strands of wire spirally wound on the rope. The rope serves as a guide for the wire and adds somewhat to the strength of the cable. I have discovered that the cause both of the creeping of the elevator and of the occasional snapping of the cable is simply the shrinkage of this Manila rope due to dampness. This cable is generally considered as an endless one running over two pulleys 16 and it sometimes passes over a sheave or pulley not shown and operates the main valve therefrom; but in the form shown it is secured to the lever 14. In either case, the result is the same. If this cable shrinks, the result will be to turn the lever or sheave as the case may be, and thus open or close the main valve to a slight degree. This admits water to the cylinder or permits it to be discharged therefrom in accordance with the direction of motion of the valve, although the valves themselves may be in perfect condition. The way in which the shrinkage is responsible for the snapping of the cable will be obvious. Now, in order to overcome this difficulty in an exceedingly simple way, I have introduced a yielding means in the length of the cable which will permit the cable to shrink without moving the valve and which when the cable expands will take up the expansion likewise without moving the valve. In its preferred form this safety device consists of a telescoping tube 17 connected with the operating cable at any desired point but preferably connecting the lever with the cable as indicated in the drawings. Within this casing is a spring 18 which is fixed to the opposite heads 19 of the casing and yields in an obvious manner to permit the expansion and contraction of the operating cable. When the cable 15 shrinks there will be an upward pull on the lever 14, but with the spring in position above it an elongation takes place to compensate for the shrinkage. Therefore the lever 14 remains stationary. In the form shown the slight shrinkage below the lever 14 can be ignored as the distance to the lower pulley 16 is so short, but the springs can be put in anywhere where needed. The shrinkage of the right half of the cable ordinarily will be transmitted up and down equally to the left half, but as the spring readily yields and it takes some force to move the valve

lever, most of the shrinkage will be taken up by a single spring as shown. To provide against undue expansion of the spring in case it should become weakened in any way, a chain or the like 20 is provided inside the spring or at least inside the casing 17 connecting the two heads 19 and of sufficient length to permit the spring to expand enough for all ordinary uses. It will be seen that by this exceedingly simple and inexpensive construction, the above mentioned results are fully accomplished and it has been found in practice that the device is exceedingly effective for this purpose. It has been applied in cases where the inspector reported that the valves required overhauling, and it entirely overcame the difficulty.

While I have illustrated and described a preferred embodiment of the invention and shown it as applied to a particular type of elevators and valve operating means, I am aware that it can be applied to many other types of the same and that many modifications can be made in the construction without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction shown and described nor to the particular type of elevator or valve operating means illustrated but

What I do claim is:—

1. In a plunger elevator, the combination with valve operating means and an operating rope or cable therefor, of yielding

means interposed between the valve operating means and one end of the operating rope or cable whereby the latter can contract and expand without moving the valve operating means.

2. In a plunger elevator, the combination with valve operating means and an operating rope or cable, of means whereby the expansion and contraction of the operating rope or cable can take place without moving the valve operating means.

3. In an elevator, the combination with a car, of an operating rope or cable provided with connections for controlling the operation of the car, movable entirely independently of the car, and a spring interposed in the length thereof, whereby the expansion and contraction of the rope or cable will not cause it to exercise any controlling effect upon the car.

4. An operating device for an elevator comprising a flexible connection, a telescoping tube connected at its two ends with said flexible connection, a spring in said telescoping tube, and a chain or cable within the tube for limiting the expansion of the spring.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

MICHAEL J. HOY.

Witnesses:

A. E. FAR,

C. F. WESSON.