(No Model.)

J. COOPER.

ELEVATOR SAFETY DEVICE.

No. 536,605. Patented Apr. 2, 1895.

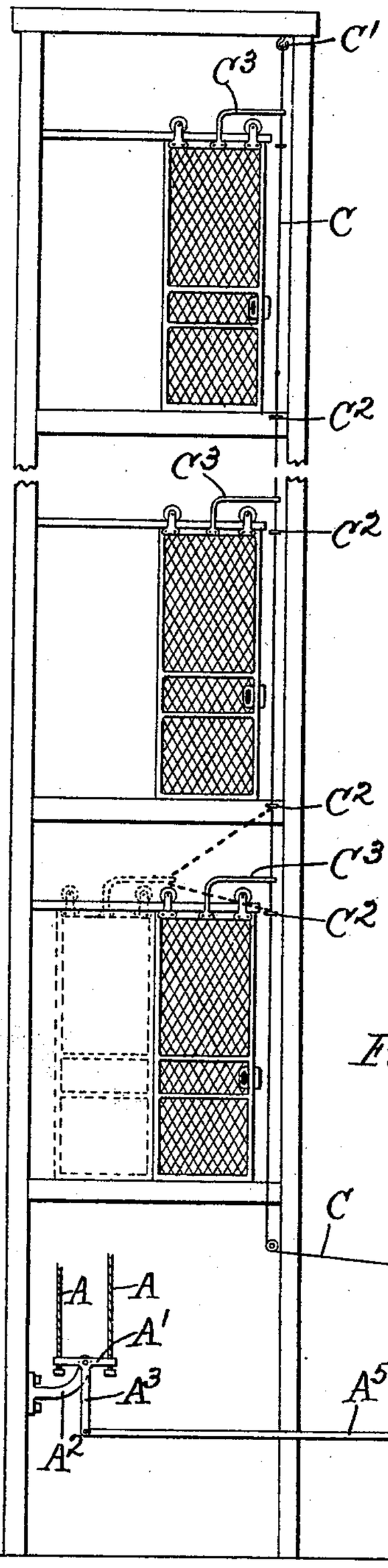


Fig. 1.

Fig. 2.

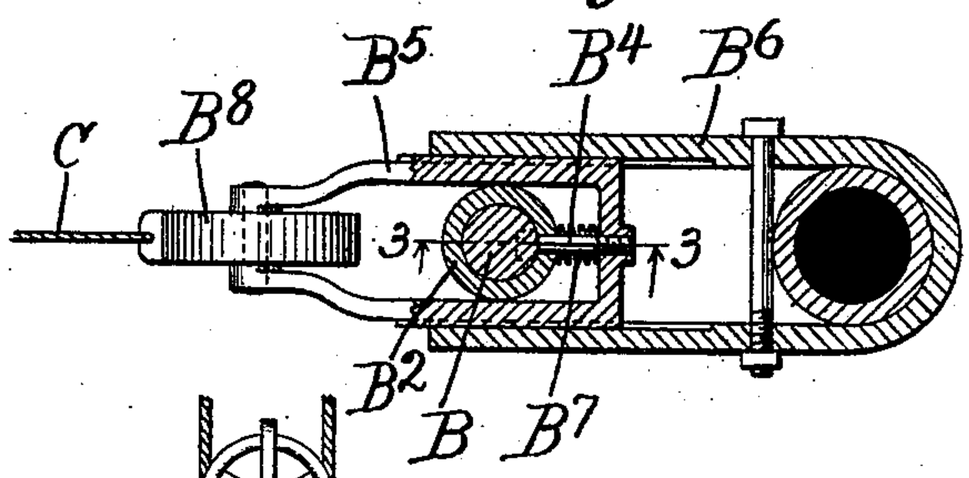
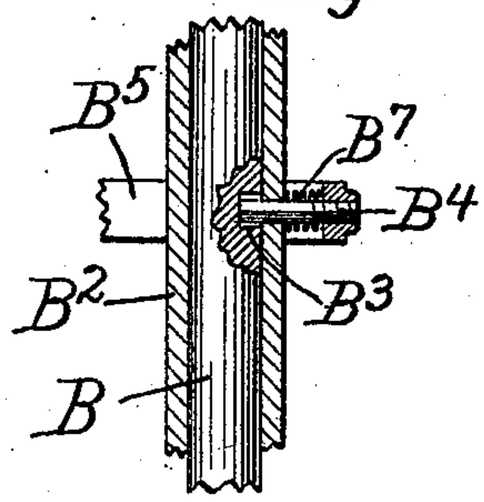


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES COOPER, OF CHICAGO, ILLINOIS.

ELEVATOR SAFETY DEVICE.

SPECIFICATION forming part of Letters Patent No. 536,605, dated April 2, 1895.

Application filed April 5, 1894. Serial No. 506,410. (No model.)

To all whom it may concern:

Be it known that I, JAMES COOPER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator Safety Devices, of which the following is a specification.

My invention relates to safety devices for elevators and has for its object to provide an improved device which, when used in connection with an elevator car, prevents said car from being started when the elevator door is open.

Referring to the accompanying drawings, Figure 1 is a view of the elevator shaft and driving mechanism of an ordinary hydraulic elevator with my device in position. Fig. 2 is a section on line 2—2 Fig. 1. Fig. 3 is a section on line 3—3 Fig. 2.

Like letters refer to like parts throughout the several figures.

In Fig. 1 I have shown a view of an elevator shaft with the elevator car omitted, the driving mechanism being of the ordinary hydraulic type. The controlling ropes or cables A A pass through the car and move in the ordinary manner by means of a lever on the car. The ends of these cables are attached to the cross piece A′, pivoted to the support A^2. Rigidly attached to the cross piece is the arm A^3 connected to the bell crank lever A^4 by the rod A^5. The other end of the lever A^4 is connected to the valve rod B, said connection being made in the ordinary manner by a sliding block. The valve rod B projects beyond the bell crank lever A^4 and extends into the tube B^2. A notch B^3 in said valve rod (see Fig. 3) is located so that it will come opposite the pin B^4 when the valve is closed. Said pin B^4 works in a hole in tube B^2 and is attached to one end of the box or frame B^5 surrounding the tube B^2 and working in the guides B^6. A spiral spring B^7 tends to keep the pin B^4 from entering the notch B^3. A coil spring B^8 has one end attached to the frame B^5, the other end being fastened to the flexible cord C which extends to the top of the elevator shaft, and is fastened to hook C′. C^2 C^2 are guides for cord C. Each elevator door is provided with an arm C^3, the cord C passing through a hole in the end of each arm. Any suitable device may be substituted for the coil spring B^8 which will allow the cord C to move a greater distance than the frame B^5, and at the same time exert a pull on said frame so as to keep the pin B^4 in the notch B^3 when said cord is moved by the opening of one of the doors.

My device may be used in connection with any sort of a valve, the only requirement being that the rod B is moved as the valve moves. In case the elevator is run by an electric motor, this rod B would be attached to the rheostat arm so that it would be locked when the elevator door is open.

It is evident that the several parts may be altered in form, construction and arrangement without departing from the spirit of my invention, and I therefore do not wish to be limited to the exact construction shown.

The use and operation of my invention are as follows: When the elevator doors are closed the cord C is suspended as shown in Fig. 1, and the spiral spring B^7 keeps the pin B^4 from engaging the valve rod B by entering the notch B^3 when the valve is closed, and hence the operator in the car can move the controlling lever or rope and hence the valve, and stop or start the car at will. If now the car is stopped at one of the floors and the door opened, the arm C^3 attached to said door carries the cord C with it (see Fig. 1) and thus shortens the cord. The frame B^5 and hence pin B^4 is pulled forward and, since the elevator is stopped, said pin enters the notch B^3 in the valve rod B. As this distance is very small some device must be used in connection with the frame that will allow the cord to be moved until the door is fully opened. Of course any suitable device may be used, the one shown in the drawings consisting of a coil spring B^8 having one end attached to the frame B^5. As the cord C shortens, said spring allows its motion to continue after the pin B^4 and frame B^5 cease to move. The spring as it is pulled out, is wound up so that it exerts a pull on the frame B^5 and keeps the pin B^4 in the notch B^3 while the door is open. When said pin is in said notch this valve rod is held rigid, and hence the valve cannot be moved so as to start the car. As the door is closed the cord C returns to its normal position, and when the said cord hangs straight the tension is taken from the frame B^5 and the spiral spring B^7 moves the pin out of the notch B^3 and frees

the valve rod B. The operator can now start the car.

As described above, the valve locking device may be said to consist of two parts, viz: the valve rod B and pin B^4, which move freely with relation to each other while the valve is open and which are adapted to be locked together when the valve is closed. It is evident that the result may be accomplished in a different manner than that shown in the drawings although I deem such illustration sufficient to show the nature of my invention.

It will thus be seen that I have here a device which prevents the elevator operator from starting the car until the door is closed, thus avoiding the danger of having persons injured by starting to pass through the door after the car is in motion.

It is evident that my device can be used in connection with any sort of a valve, and that it may also be used in connection with a rheostat arm or the like in case of electric elevators.

I claim—

1. The combination in an elevator apparatus of a motor mechanism, a moving element by which said motor mechanism is controlled, a rod attached to said moving element and provided with a single notch, a pin which is opposite said notch only when the motor mechanism is stationary, but normally out of engagement with said notch, and connections between said pin and the elevator doors, said connections being unbroken both when the doors are open and closed whereby the pin is forced into said notch when one of the doors is open, and the valve is closed.

2. The combination with the driving mechanism of an elevator, of a moving element by which said driving mechanism is controlled, a locking device for said moving element comprising two parts which move freely with relation to each other at all times when the driving mechanism is in motion but which are adapted to be locked together when the driving mechanism is at rest, and connections between said locking device and the elevator doors said connections being unbroken both when the doors are open and closed whereby the moving element is locked when one of the elevator doors is open and said moving element is in the position that brings the driving mechanism to rest.

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Witnesses:
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