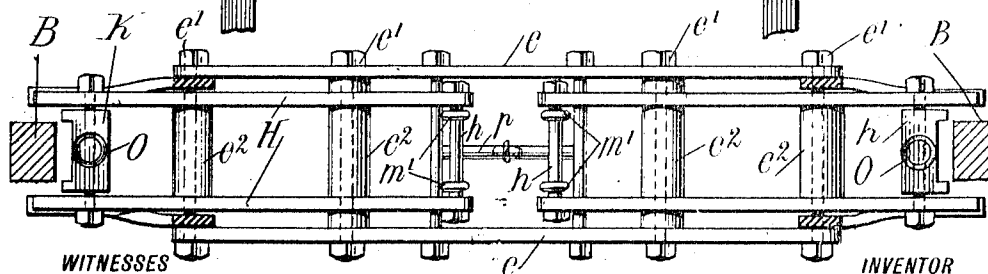


2 SHEETS—SHEET 1.



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A. G. HULING.
SAFETY DEVICE FOR THE CAGES OF LIFTS AND HOISTS.
APPLICATION FILED AUG. 17, 1911.

1,055,179.

Patented Mar. 4, 1913.

2 SHEETS—SHEET 2.

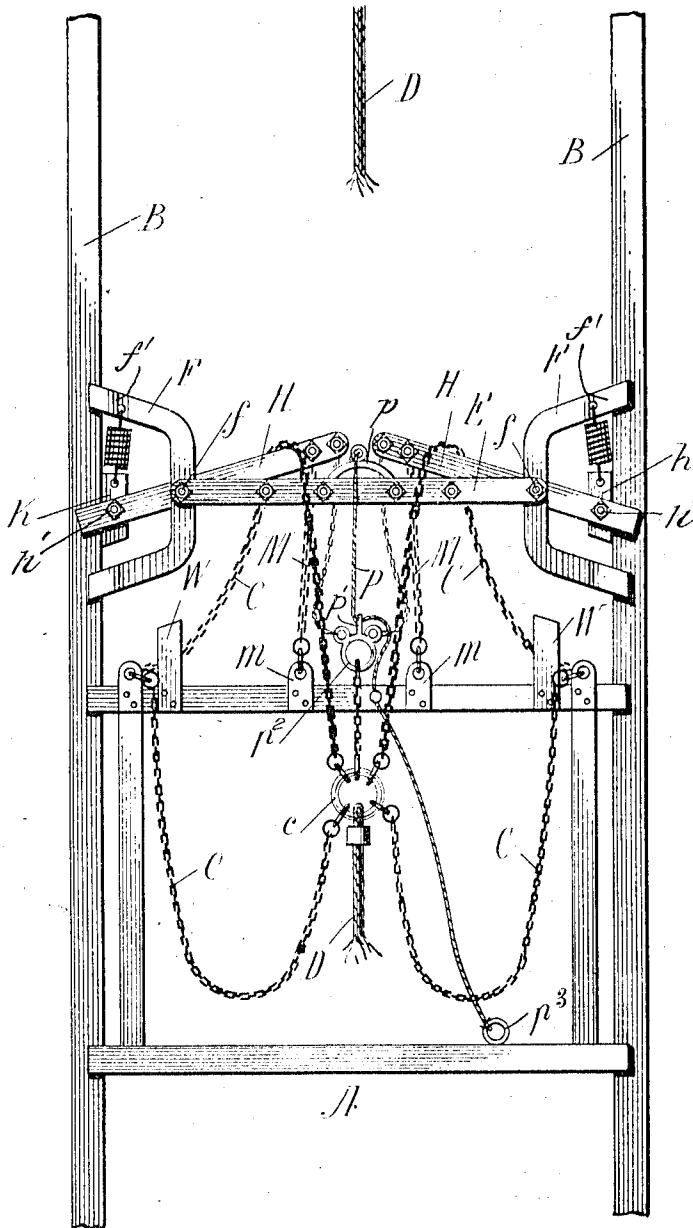


Fig. 3

WITNESSES

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UNITED STATES PATENT OFFICE.

ARTHUR GARDNER HULING, OF LA SALLE, ILLINOIS.

SAFETY DEVICE FOR THE CAGES OF LIFTS AND HOISTS.

1,055,179.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed August 17, 1911. Serial No. 644,490.

To all whom it may concern:

Be it known that I, ARTHUR G. HULING, a citizen of the United States, and a resident of La Salle, in the county of LaSalle and State of Illinois, have invented a new and Improved Safety Device for the Cages of Lifts and Hoists, of which the following is a full, clear, and exact description.

An object of the invention is to provide a simple, and automatically operating safety device which will check the descent of a cage of an elevator or hoist in the event of the accidental breaking of the hoisting rope or cable, and to so construct the device that at the instant of the breaking of the hoisting rope or cable, the weight of the cage or car acts to throw into operation the frictional safety device.

A further object of the invention is to provide means under the control of the operator whereby, at will, the descent of the cage may be checked in the event of attaining too great a speed for safety.

Reference is to be had to the accompanying drawings constituting a part of this specification, in which similar characters of reference denote corresponding parts in all the views, and in which—

Figure 1 shows a front elevation of a lift or hoist embodying the invention; Fig. 2 shows a top plan view, parts being in section, of the automatic safety device; and Fig. 3 shows a front elevation of the apparatus just after the breaking of the hoisting rope, and illustrating the mode of operation.

A represents a cage or car which may be of any usual or preferred construction, and which is arranged to move vertically between suitable guide rails B, all in the usual manner. The cage or car A is connected by means of chains C to a ring *c* which is connected to the hoisting rope D. There are preferably four chains C—C, one connected to each corner of the top of the cage and all of which are connected to the ring *c*. In the normal operation of the apparatus, the rope or cable D and the chains C support the cage or car A, and raise and lower the same by power from any suitable source acting upon the rope or cable D. The improved safety device comprises a cross head E which is preferably constructed of side bars *e*, and held together by the transverse bolts *e'*, and the spacing

sleeves *e''* (see Fig. 2 of the drawings). The cross head E is somewhat shorter than the distance between the guide rails B, and at each end it is provided with the frames F, bolted or riveted to the side bars *e* as shown at *f*, the frames F having the forwardly extending arms *f'* which engage the opposite faces of the guide rails B and assist in guiding the cross head E and its various instrumentalities as it is moved up and down with the cage or car A. Mounted upon the bolts *e'* at opposite ends of the cross head E are the levers H which are arranged in pairs as shown, and which at their upper ends are connected by bolts *h* and at their lower ends support bolts *h'*, upon which are mounted the friction shoes or blocks K, arranged in close proximity to the inner faces of the guide rails B, but normally held out of contact therewith. In the event of the breaking of the cable or rope D, it is intended that a pull shall be applied to the inner ends of the levers H, and thus force the friction blocks K in close contact with the inner faces of the guide rails B, and for this purpose the cage A is connected to the inner ends of the levers H by means of chains or cables M, there being preferably four of such cables, two connected to each side of the top frame of the cage or car as shown at *m*, and at their upper ends by rings *m'* mounted upon the bolts *h*. The chains or cables M are of such length as to normally permit the lifting of the inner ends of the levers H, as shown in Fig. 1 of the drawings, so as to hold the friction blocks K out of contact with the guide rails B during the normal running of the cage or car. The inner ends of the levers H are lifted and held lifted by means of light chains N which are connected at their lower ends to the bolts *h*, and at their upper ends to the ring *c* through an intermediate connection to be described.

From the foregoing description, it will be observed that the cross head E and the safety device mounted thereon constitute a separate and distinct carriage from that of the cage or car, and that it is under the normal operation of the elevating means held and moved up or down with the cage or car at substantially a uniform distance above the top of the cage or car at all times, and that during such normal operation, the

inner ends of the levers H are held up with the friction shoes or blocks K out of contact with the inner faces of the guide rails B. It will be further understood that the levers H are held elevated at their inner ends by means of the chains N connected to the ring c. Assuming that the cable D accidentally breaks, the supporting chains C at once drop by gravity as will also the chains N, and the entire weight of the cage or car is transferred to the chains M, which are connected to the inner or upper ends of the levers H, and thus the weight of the car pulling upon the levers H, rock the said levers about their fulcrums, instantly forcing the friction blocks or shoes K into direct frictional engagement with the inner faces of the guide rails B, thus checking and stopping the descent of the cage or car A. The springs O in the normal operation of the car will be distended as shown in Fig. 1, and during the normal operation, act to maintain the friction blocks K in an upright position with their faces parallel to the faces of the guide rails B. As soon, however, as the cable breaks, the springs act to pull up upon the blocks K and the ends of the levers H to cause an initial contact or frictional engagement of the blocks with the rails B, after which the weight of the car through the chains M, will cause a forcible and positive frictional contact of the blocks K with the rails B.

In order to prevent the safety device from dropping too close to the top of the cage or car, there are provided the stops W projecting sufficiently above the top to form rests or supports for the frames F.

It may at times be desired that the operator shall be able to check the descent of the cage or car, in case, by reason of overloading, it should be descending too fast for safety, and to this end, there is provided means whereby the crosshead E and its connected safety devices may be raised relatively to the top of the cage or car, and thus, by raising the fulcrums f of the levers H, cause the friction shoes or blocks K to engage the guide rails B. To this end, there is provided a cord or rope P, which at one end is connected to a metallic bracket p attached to the top of the crosshead E, and this rope or cord P passes through an eye p' of a ring p², the other end of the cord P leading to the cage or car A, and provided with a ring or handle p³ in convenient reach of the operator. A pull upon the handle p³ will cause the corresponding elevation of the crosshead E, and thus the levers H will be rocked, bringing the friction shoes K into engagement with the guide rails B.

It may be desirable at times to use U shaped shoes or friction blocks which will embrace the sides of the guides B instead of the faces of the same. This is intended to

prevent severe outward pressure from spreading the guides B, should the cage or hoist be very heavy.

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

1. In combination, a cage or car of an elevator, a cross head located above but independent of said cage or car, arms at the end of the cross-head, a lever mounted on said cross-head and carrying a friction dog, a hoisting rope, means for connecting the cage or car to the hoisting rope, means for independently connecting the cage or car to the lever of the friction dog, means connected to the lever and the hoisting rope to normally hold said friction dog inactive and a spring connecting the friction dog with one of said arms.

2. In combination, a cage or car for elevators, a cross head supported above but independent of said cage or car, a lever pivotally mounted at each end of the cross head, a friction dog carried by each of said levers, a frame at each end of the cross head and provided with upper and lower arms for engaging the guide rails, a hoisting rope, means for connecting the cage or car to the hoisting rope, independent means for connecting the cage or car to the inner ends of the levers, means for normally holding the levers out of operation, and springs connecting the upper ends of the friction dogs with the upper arms of said frames.

3. In combination, a cage or car for elevators, a cross head supported above but independent of said cage or car, a lever pivotally mounted at each end of the cross head, a friction dog carried by each of said levers, a hoisting rope, means for connecting the cage or car to the hoisting rope, independent means for connecting the cage or car to the inner ends of the levers, means for normally holding the said levers out of operation, and means under the control of the operator for raising the cross head with relation to the cage or car, to operate the friction dogs and cause them to engage the guide rails.

4. In combination, a cage or car for elevators, a cross-head located above but independent of the cage or car, the cross head being provided with members for engaging the guide rails, safety braking devices mounted upon said cross head, a hoisting rope, means for connecting the cage or car to the hoisting rope, means for connecting the cage or car to the safety braking devices of the cross head, means for connecting the safety braking devices to the hoisting rope, and tension devices connecting the braking devices with members of the cross head to move the braking devices into initial braking position.

5. In combination, a cage or car for elevators, a cross head located above but inde-

pendent of the cage or car, a lever pivotally
mounted on said cross head and carrying a
friction dog, a hoisting rope, means for con-
necting the cage or car to the hoisting rope,
5 means for independently connecting the cage
or car to the said lever, means for normally
holding the lever and friction dog in inactive
position, a spring connected at one end with
the friction dog, and a connection between
10 the other end of the spring and the cross
head, the said spring maintaining the fric-

tion dog in an upright position, and adapted
when the hoisting rope breaks to move the
lever and the friction dog into active
position.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

ARTHUR GARDNER HULING.

Witnesses:

W. H. FRASER,

ADELBERT G. LEE.