

No. 648,642.

Patented May 1, 1900.

L. F. TEBEL.
ELEVATOR LOCK.

(Application filed Aug. 18, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.

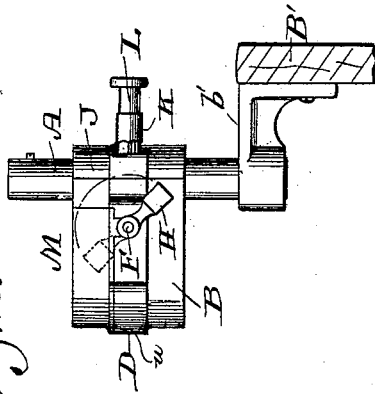


Fig. 7.

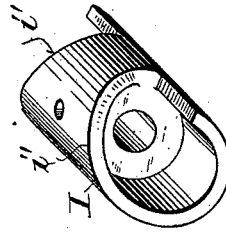


Fig. 8.

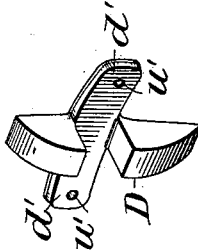
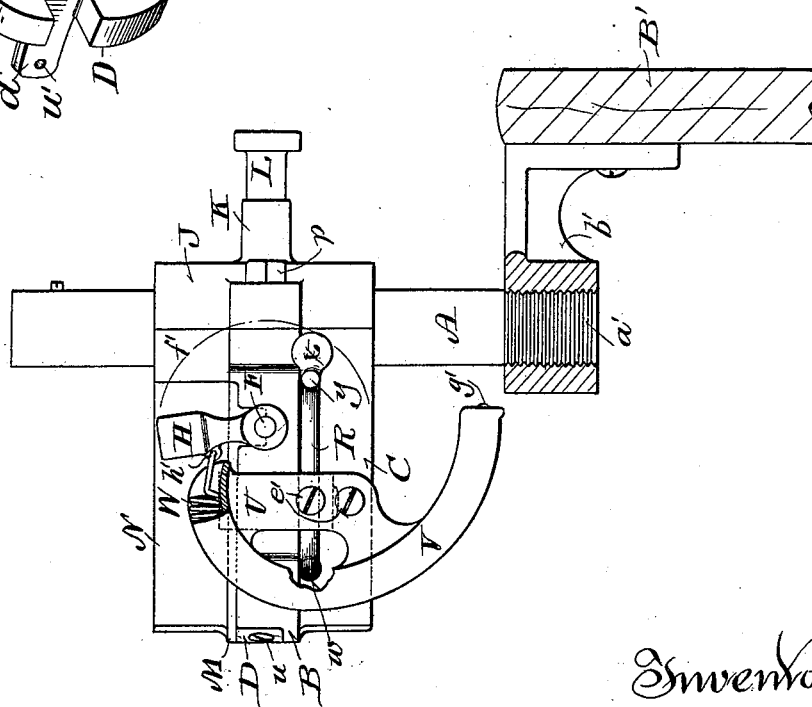


Fig. 1.



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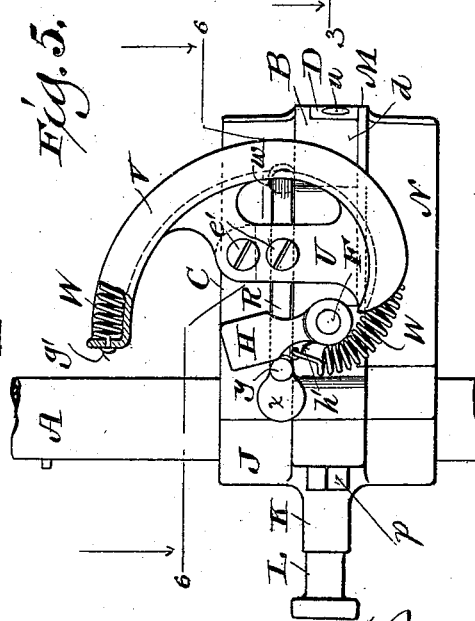
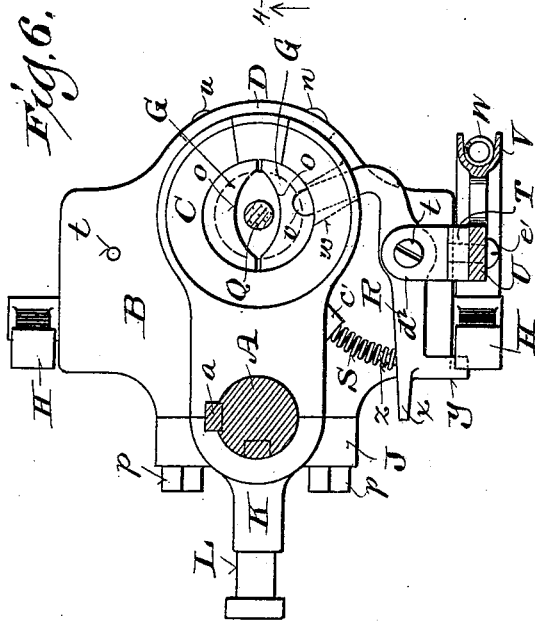
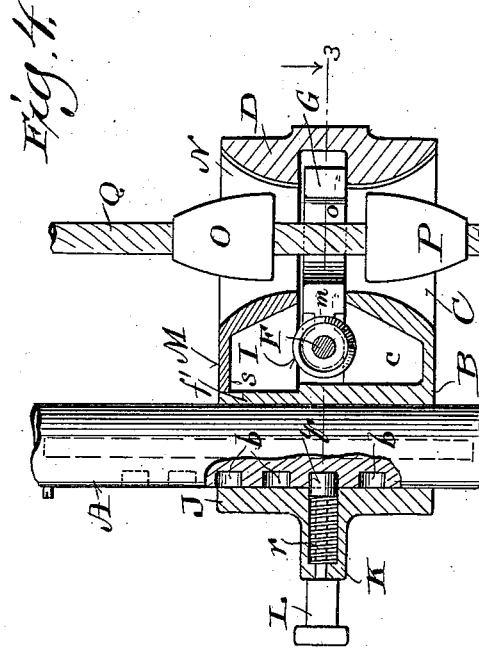
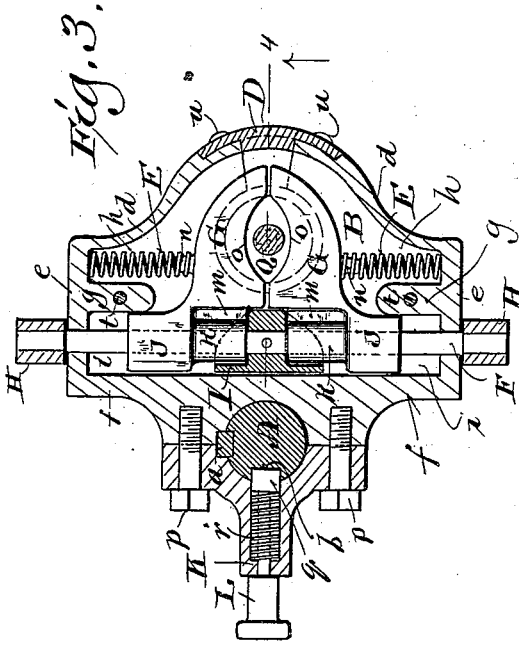
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UNITED STATES PATENT OFFICE.

LOUIS F. TEBEL, OF MILWAUKEE, WISCONSIN.

ELEVATOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 648,642, dated May 1, 1900.

Application filed August 18, 1899. Serial No. 727,671. (No model.)

To all whom it may concern:

Be it known that I, LOUIS F. TEBEL, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Elevator-Locks; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has especial reference to locking devices for passenger or freight elevators traveling in a vertical elevator-shaft; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a side elevation of one form of my improved device, partly broken away or in section to better illustrate certain details of construction and with the levers in the open or unlocked position. Fig. 2 is a similar view, on a reduced scale, of said device, omitting certain features shown in the preceding figure and showing the levers in the closed or locked position. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 4. Fig. 4 is a vertical sectional view on the line 4 4 of Fig. 3. Fig. 5 is another side elevation of my device of the form shown in Fig. 1, broken away at one point to illustrate a detail of construction and showing the elevator-lock in vertically-reversed position on the post from the position shown in Fig. 1 and with the levers in the closed or locked position. Fig. 6 is a plan view of the form and arrangement of my device shown in the preceding figure, partly in horizontal section, on the line 6 6 in said figure. Fig. 7 is a detail perspective view of the cam that operates the locking-leaves. Fig. 8 is a detail perspective view of the closing-plug or back piece.

Referring to the drawings, A represents a vertical post having a spline *a* rigid therewith, which post is shown screw-threaded at its lower end *a'* for engagement with a screw-threaded bore in a flange *b'*, secured to and projecting from a portion B' of the elevator car or cage, said post A thus forming part of the framework of said car or cage and being provided with a series of sockets *b b b* to enable the lock to be secured at different elevations on said post, as hereinafter explained. B represents the shell of the said lock, com-

prising a horizontal plate having a conical walled open cup C integral therewith, adjacent to which, near said post A, is a recess *c*, the said plate of the shell B being provided with a vertical flange *d e f*, extending all around its edge, the rear wall of said cup and said plate and its flange being centrally cut away vertically to receive a plug or back piece D, hereinafter more particularly described. From opposing end portions *e e* of said flange there project inwardly flange extensions *g g*, forming recesses *h h* between them and the adjacent portions of the back part *d* of said flange to receive spiral springs E E, while on the other side of said flange extensions *g g* and between the same and the front portions *f f* of said flange there are other recesses *i i* to receive the cam-shaft F and the ends *j k j k* of the locking-leaves G G, the said ends of the leaves having smooth bores therethrough and being loosely mounted and movable upon said cam-shaft F. The ends of the cam-shaft F project beyond the end portions *e e* of the described flange, which is cut through from its upper edge for this purpose, and said projecting ends are fitted with levers H H, rigidly secured thereto, for operating said cam-shaft, and to the center of said shaft F there is rigidly secured the annular cam I, (shown detached in Fig. 7,) whose spirally-disposed ends *i' i'* engage with the end edges of the webs *m m*, that connect the rounded parts *k k* of the ends of the locking-leaves G G with the main portions of the latter, while said rounded portions *k k* are forced within the annular shell of said cam I by the action of the springs E E, the leaves G G being preferably formed with lugs *n n* to receive the adjacent ends of said springs, and the said leaves having rounded concave opposing faces, as shown at *o o*, so as to clear the opening in the cup C of the shell B when said leaves are forced back by the action of the cam I.

At the front of the device the front portion *f f* of the described flange on the shell B is centrally continued beyond the horizontal plane of the remaining portion of said flange, as shown at *f'*, and against this front end *f f'* of the shell, which is recessed to receive the described post A and its spline *a*, is placed the similarly-recessed cap J and secured thereto by screws *p p*. The cap J is formed with a

lateral projection K, having a bore in the end thereof for the passage therethrough of the shank of the spring-bolt L, whose head *q* and spring *r* move in a recess in said projection K, so that said head *q* may be withdrawn from its seat within one of the sockets *b* of the post A and forced into another socket in the vertical adjustment of the elevator-lock upon said post. M represents the closing plate or cap of the lock, which fits upon the portions *d e e* of the described flange of the said shell B, and which is formed with a reversely-flaring conical-walled open cup N and adjacent recess *s*, and which is secured to the said shell B, as by screws *t t*, passing into the flange extensions *g g* of said shell. The rear wall of said plate M and its cup N is centrally cut away vertically similarly to the shell B and cup C for the reception of the plug or back piece D, the inner face of said back piece conforming in shape to that of the conical walls of the cups C N and the outer face of the back piece D having central lateral extensions received in recesses in the flange *d* and secured thereto by screws *u u*.

My described lock, consisting of the shell and cup B C, closing-plate and cup M N, and the interposed locking-leaves G G and operating mechanism is reversible, so as to be applied to the post with the shell B lowermost and plate M uppermost, as in Figs. 1, 2, 3, and 4, or with the shell B above and plate M below, as shown in Figs. 5 and 6, accordingly as may be more convenient for ready access to the locking-levers H H in any particular construction or arrangement of the elevator car or cage to which my lock is to be applied, and in many cases my device would be preferably constructed in its simplest form shown in Fig. 2, where the levers H H are shown free from the attachments illustrated in Figs. 1, 5, and 9. In this simplest form and with the shell B lowermost, as shown in Fig. 2, when the locking-leaves G G are closed, they are kept closed so long as the levers H remain in the downward position, (represented in full lines in said Fig. 2,) and the weight of the heads of said levers H, together with the force of the springs E, will be sufficient to keep said levers in such downward position, with the locking-leaves G G as shown in Fig. 3. If it is desired to open the leaves G G, the said levers H are raised by the elevator operator into the position shown in dotted lines in Fig. 2, which action rocks the cam-shaft F, to which the said levers H are rigidly secured, thereby partly rotating the cam I, fast on said shaft, and the spiral edges *v' v'* on said cam in engagement with the edges of the webs *m m* of the said leaves G G will force said leaves apart, compressing the springs E E until the concave faces *o o* of said leaves clear the opening of the described cups C N and afford a clear passage for the conical stops O P on the cable Q, (shown in Fig. 4,) there being of course a pair of

these stops on said cable opposite each landing, and when this is done the elevator is of course free to pass up or down; but when it is desired to stop the elevator at any landing then by a simple movement of the levers H the cam I is turned so as to permit the springs E E to again force the locking-leaves G G into the closed position, (best shown in Fig. 3,) and as the lock on the elevator comes against the pointed end of the first stop on said cable this stop will force said leaves G G apart, permitting said stop to clear the leaves, but the said springs E E will then instantly bring the adjacent faces of the leaves together again, and said leaves will next come against the base end of the other conical stop, which will thus instantly arrest the movement of the elevator and hold the same stationary at that landing until the levers H are turned to force the leaves G G back to their open position.

With the form of my device shown in Fig. 2 and just described the levers H always require to be operated by the person within the car or cage who is running the elevator; but the attachments shown in Figs. 1, 5, and 6 and now to be described will enable the lock to be operated by the cable from a point distant from the said car or cage, as hereinafter explained. R is a trip-lever pivotally held against the horizontal outer portion of the shell B and formed with an inwardly-projecting rounded or otherwise reduced end *v*, which extends through a slot *w* in the wall of the cup C, said lever R having a thumb-piece *x* and an outward-projecting stop *y* at its other end, with a lug *z* projecting inwardly from said end opposite the stop *y*. S is a spring extending from said lug *z* to a seat or socket *c'*, formed on or in the shell B adjacent to the exterior wall of the cup C, which spring acts to normally keep the outer end of said lever R outward and the inner end *v* of said lever inward, beyond the inner wall of said cup C, as best shown in Fig. 6. The lever R is held against the outer face of the shell B by one of the horizontal arms *d'* of a yoke T and by one of the hereinbefore-named screws *t*, which unite the shell B and closing-plate M, the said screw serving as the pivot of said lever R and the other horizontal arm of said yoke fitting against the outer face of the closing-plate M, but not being shown in the drawings. U is a plate secured to the vertical part of the yoke T, as by screws *e' e'*, and having a rounded grooved rim V, preferably of a volute form, said groove serving as the seat for a spiral spring W, one end of said spring being secured to the end of said rim, as shown at *g'*, and the other end of said spring being secured to one of the levers H, as shown at *h'*. When the locking-leaves G G are in closed position, the lever H on the end of the cam-rod F nearest the spring W is held in what is called the "locked" position by engagement with the stop *y* on the lever R, as shown in Figs. 5 and 6, against the retractile force of the

spring W; but the instant that the thumb-piece *x* on said lever R is pressed toward and the stop *y* thereby withdrawn from contact with said lever H the spring W will retract and pull the lever H to the open position, thus locking the cam-shaft F and forcing the locking-leaves G G apart to the open position. Thus when the said parts R S T U V W are used with my device the leaves G G can be kept closed by the stop *y* on the lever R and instantly opened by the operator within the elevator car or cage touching the thumb-piece *x* of said lever R whether the elevator-lock is in the normal position on the post A (shown in Fig. 1) or in the reversed position, (shown in Figs. 5 and 6,) a manual operation of one of the levers H being required to close the locking-leaves and bring the elevator to a stop by consequent engagement with the described conical cable-stops O P opposite the desired landing, and hence this locking operation is substantially the same whether the last-described form of my device or the simpler form (shown in Fig. 2) is employed; but, as already stated, it is sometimes desirable to provide means for unlocking the leaves G G from a point remote from the landing where the elevator car or cage has been stopped and when there is no operator in said car or cage, and to accomplish this result with the form of device shown in Figs. 1, 5, and 6 it is only necessary to take hold of the cable Q at such point remote from the car or cage and agitate it, when the conical stop which is then within the cup C will strike against the reduced projecting inner end *v* of the lever R and force said end outward, thereby withdrawing the stop *y* from contact with the adjacent lever H, which will permit the spring W to act and instantly pull said lever to the open position, thus rocking the cam-shaft F and forcing the locking-leaves G G apart, as already described, and permitting the elevator to resume its travel.

From various causes the cable Q, which is used to operate the controlling mechanism for starting and stopping the travel of the elevator car or cage, is liable to lengthen or shorten to a slight extent, and the result of this would be to cause a difference between the level or plane of the floor of said car or cage and that of the floors of the landings at the several stories of the building within which the said elevator is located, and a difference in height of even an inch or less is a source of annoyance and danger. To obviate this and compensate for any stretching or shortening of the elevator-cable after the conical stops O P have been once adjusted and secured thereto, I have provided the series of sockets *b b b* in the post A and the adjusting spring-controlled bolt L, (best shown in Fig. 4,) whereby the said car or cage may be brought to the proper level at any time after such variation, which is frequently caused by variation of temperature from time to time as well as by continued use of said cable.

By reason of the described construction of my device the movement of the locking-leaves either toward or from each other will always be a sliding movement in a straight line, with the opposed faces of said locking-leaves always parallel, and hence a secure lock for the cable-stops is always provided and the danger of said stops being forced through between said leaves, as sometimes arises when the locking-leaves of an elevator-lock are pivoted to the shell at their ends so as to have movement on the arcs of a circle, is entirely obviated.

The herein-described plug or back piece D is of the usual form of such devices employed to close the vertical openings in the shells and closing plates or caps of elevator-locks, which openings, as is well known, are for the lateral admission of the elevator-cable, said plug D being shown detached in Fig. 8, wherein the central lateral extensions of said plug are marked *d' d'*, with holes *u' u'* therethrough for the admission of the hereinbefore-named securing-screws *u u*.

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

1. The combination with the car or cage of an elevator of a post secured thereto and provided with a series of sockets, an elevator-lock movable on said post, and a spring-controlled bolt on said lock for adjustable engagement with one or another of said sockets.

2. In an elevator-lock, the combination with a shell and closing-plate having open guiding-cups for the passage of a cable and its stops therethrough, of a shaft extending through said shell, a cam fast on said shaft, and a pair of spring-controlled locking-leaves loosely mounted on said shaft, and capable of a sliding movement, in a straight line, only, to open or close the opening between said guiding-cups on the rotation of said cam in the proper direction.

3. In an elevator-lock, the combination with a shell and closing-plate having open guiding-cups for the passage of a cable and its stops therethrough, of a rocking cam-shaft extending through said shell, and having levers on its projecting ends; a pair of sliding locking-leaves supported in said shell but free from attachment thereto, and loosely mounted on said shaft; a cam fast on said shaft between the ends of said locking-leaves, and springs arranged parallel to said shaft and bearing against said locking-leaves, whereby the opposed parallel faces of the latter will be forced together, in a straight line, by said springs to close the opening between said guiding-cups when the said shaft is rocked in one direction, or forced apart by said cam when the shaft is rocked in the opposite direction.

4. In an elevator-lock, the combination with a shell and closing-plate having open guiding-cups for the passage of a cable and its stops therethrough, of a rocking cam-shaft extending through said shell and having le-

vers on its projecting ends; a pair of locking-leaves having rounded ends loosely mounted on said shaft; springs for forcing the adjacent faces of said locking-leaves together to
 5 close the opening between said guiding-cups; a cam in the form of an annular shell provided with spiral ends, fast on said shaft between said rounded ends of the said locking-leaves, the annular shell of the said cam receiving said rounded ends of the leaves when
 10 the latter are forced together by said springs, when the shaft is rocked in one direction, and the spiral ends of said cam engaging with the edges of the ends of said leaves and forcing
 15 the latter apart against the force of said springs, when the said shaft is rocked in the opposite direction.

5. In an elevator-lock, the combination with a cable provided with oppositely-disposed conical stops, and a shell and closing-plate having open guiding-cups for the passage of said cable and its stops therethrough, the wall of one of said cups having a slot
 20 therethrough, of a rocking cam-shaft extending through said shell and having levers on its projecting ends; a pair of locking-leaves having rounded ends loosely mounted on said shaft; springs for forcing the adjacent faces
 25 of said locking-leaves together; a cam in the

form of an annular shell provided with spiral ends, fast on said shaft between said rounded ends of the said locking-leaves; a trip-lever, pivoted to the said shell, and formed at one end with an inward projection extending through the slot in the adjacent cup-wall, and the opposite end of said lever having an outward-projecting stop; a spring for keeping said stop on the trip-lever normally in the path of the adjacent lever on the rocking cam-shaft; a plate secured to said shell, having a
 40 spring-supporting rim, and a spiral spring carried thereby, one end of said spring being secured to said plate, and the other end of said spring being secured to the said adjacent lever on the rocking cam-shaft.

6. The combination with the car or cage of an elevator, of a post secured thereto, and an elevator-lock adjustable longitudinally of said post.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

LOUIS F. TEBEL.

Witnesses:

H. G. UNDERWOOD,
 B. C. ROLOFF.