(No Model.) 2 Sheets—Sheet 1.

M. MARTIN.

SAFETY LIFT.

No. 305,212. Patented Sept. 16, 1884.

Fig. 1.

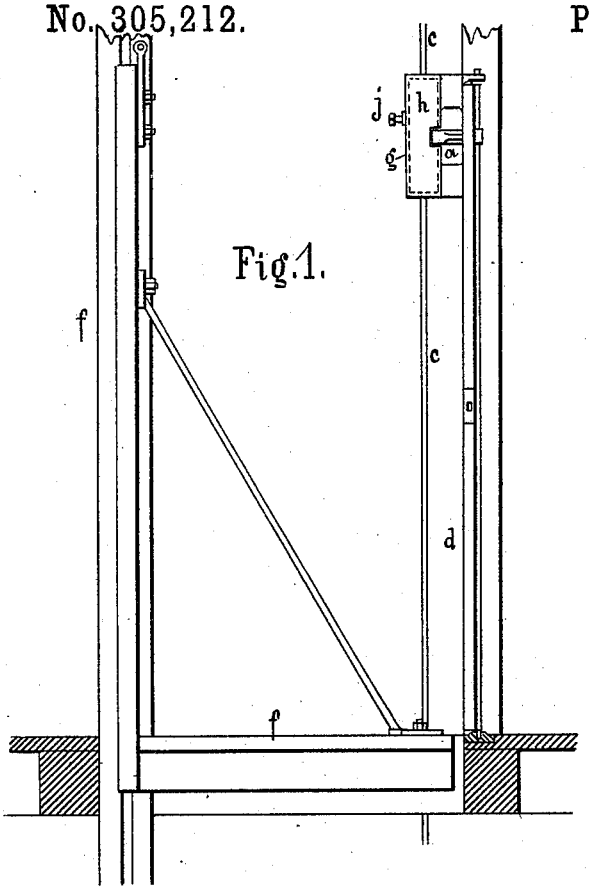


Fig. 3.

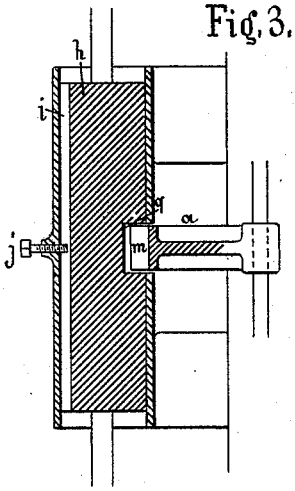


Fig. 4.

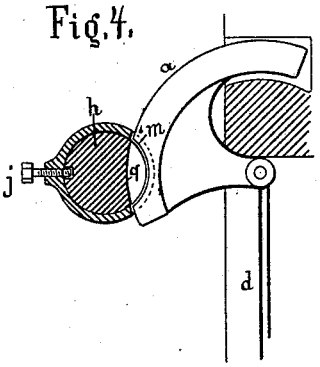


Fig. 2.

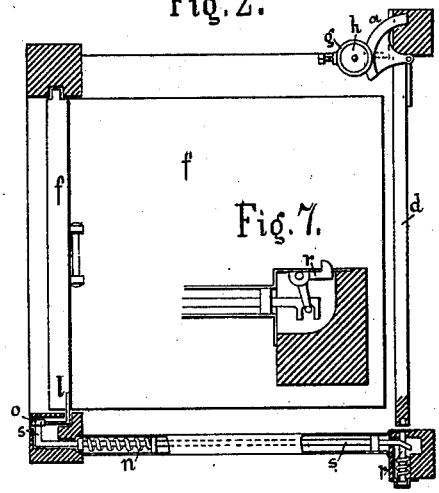
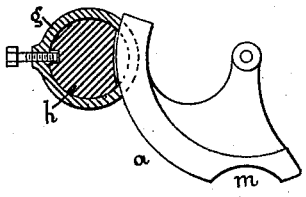


Fig. 7.

Fig. 5.



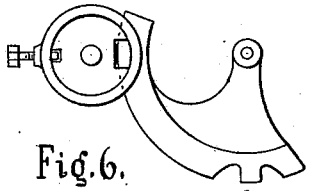


Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

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SAFETY LIFT.

No. 305,212. Patented Sept. 16, 1884.

Fig. 8.

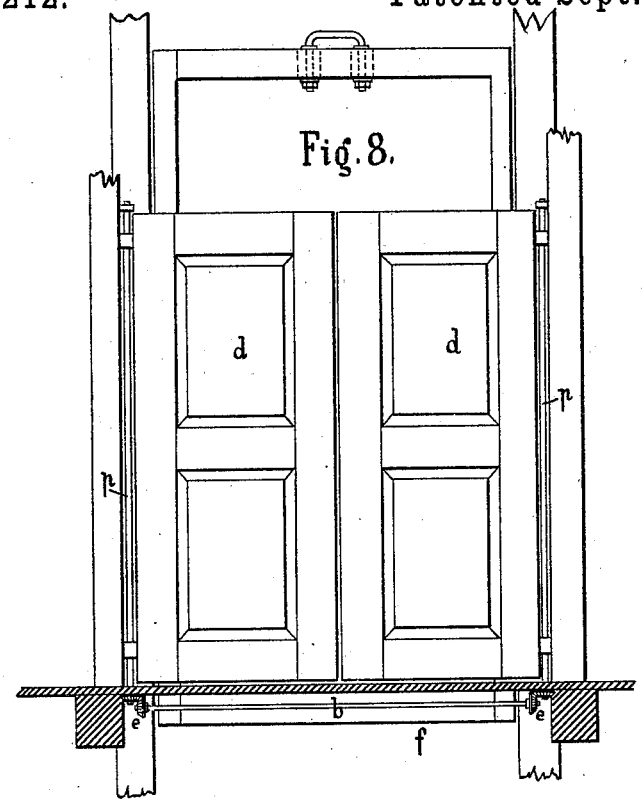
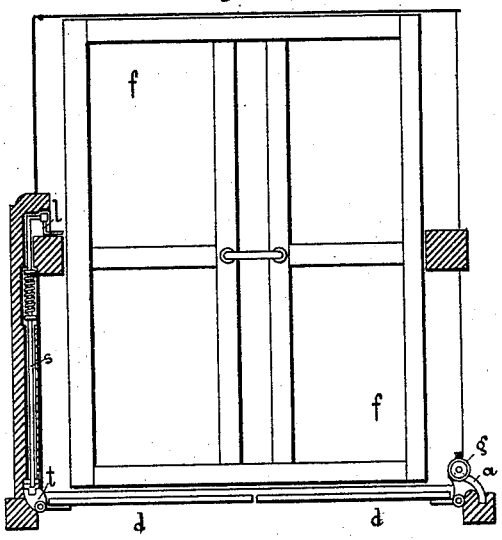


Fig. 9.



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UNITED STATES PATENT OFFICE.

MORITZ MARTIN, OF BITTERFELD, PRUSSIA, GERMANY.

SAFETY-LIFT.

SPECIFICATION forming part of Letters Patent No. 305,212, dated September 16, 1884.

Application filed July 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, MORITZ MARTIN, of Bitterfeld, Prussia, Germany, manufacturer, have invented new and useful Improvements in Safety-Lifts, of which the following is a specification.

My invention relates to lifts for raising and lowering goods in warehouses, factories, &c., and the floor-openings whereof are guarded by doors; and it consists in a device for preventing the lift from being moved away from a floor so long as the doors of the same floor are not completely closed. Besides, the invention comprises mechanism serving to keep the doors of any floor locked, except when the lift is on a level with the floor.

The invention is represented on the annexed two sheets of drawings.

Figure 1 shows in a vertical sectional side view a lift provided with my invention. Fig. 2 is a sectional plan thereof. Fig. 3 is a vertical section, and Fig. 4 a sectional plan, of the device constituting the main part of the invention, the door being supposed to be closed. Fig. 5 is a plan showing the position of the parts when the door is open. Fig. 6 shows a modified arrangement of a portion of the device. Fig. 7 represents a modification of the door-locking mechanism. Figs. 8 and 9 are respectively a front elevation and a sectional plan of a lift having a door with two leaves.

For the purpose of preventing the lift from being put in motion while the doors guarding the floor-opening of the lift are open, the rod (or rope) leading to the starting-lever of the winding machinery and brake has a sliding piece connected to it provided with a notch, and to the door is fixed a sector, which, when the door is open, engages with the said notch; so that under these conditions no pull or thrust can be transmitted by the rod to the said machinery, whereas when the door is closed the sector leaves the notch of the sliding piece, the rod being then free to be operated for releasing the brake or for putting, in addition thereto, the winding-machine into gear.

In Figs. 1 and 2, *f* is the lift, *d* the door, and *c* the rod (or rope) leading to the starting-lever of the winding machinery and brake. The latter parts are not shown in the drawings, as they do not constitute any part of the invention, and as they may be of any known construction. To the said rod *c* is connected the sliding piece *h*, (see also Figs. 3, 4, and 5,) represented in the drawings as being round in section, but which may be of any other convenient sectional shape. This piece is vertically movable in the guide *g*, but so as to be prevented from rotating, for which purpose it is shown as being provided with a groove, *i*, into which projects a screw, *j*.

To the door *d* is fixed the sector *a*, extending through a horizontal slit of the guide *g* into a notch, *q*, cut into the piece *h*. The sector has a notch, *m*, corresponding to the sectional form of the piece *h*, and which registers with the latter when the door *d* is closed. The parts being thus arranged and the door closed, as in Figs. 1 to 4, the piece *h* is free to pass through the notch *m*. The rod *c* may consequently be moved to operate the starting-lever of the winding-machine, and thus to put the lift in motion; but when the door is opened, however little, the notch *m* does not register any more with *h*, and no pull or thrust can be exercised by means of the rod *c*.

Fig. 5 shows the position of the sector *a* when the door is fully open.

In the modification represented by Fig. 6 the sector is provided within the notch *m* with a tooth, *k*, the piece *h* having a groove to correspond therewith. This tooth may be tapered toward the top and the bottom, so that in case the door *d* is not fully closed the motion imparted to the rod *c* will cause the sides of the said groove to act against the inclined surfaces of the tooth, and thereby cause the door to be completely closed.

The door-locking mechanism comprises a bolt actuated by a spring, so as to keep another bolt or catch in engagement with the door, and which a tappet on the lift draws back when the platform of the lift arrives in the opening guarded by the door.

In Fig. 2, *s* is the main bolt, and *n* the spring which pushes it toward the door *d*. At the end toward the back of the lift the bolt is bent at an angle, and against this portion of the same, which is preferably provided with a roller, *o*, acts the tappet or cam *l*, adapted to push the bolt backward against the pressure

of the spring *n*. These parts are, however, not new, as they have been described in the specification of my United States Patent No. 271,884; but with the said bolt another bolt or locking-piece *r* is combined, actuated by a spring to engage with a mortise in the door, while at the end of the bolt *s* there is an inclined surface which acts against a shoulder on the piece *r*, to withdraw it from the mortise when the bolt *s* is drawn back by the tappet *l*. The door will thus be free to be opened when the lift is in the position shown in the drawings, while it is kept locked so long as the lift is above or below this position.

According to Fig. 7 the locking-piece *r* consists in a bell-crank lever, one arm of which forms the catch engaging with the door, while the other arm is in connection with the bolt *s*.

Figs. 8 and 9 show an arrangement in which the floor-opening of the lift is guarded by a door with two leaves, the axles *p* whereof are fixed to the leaves, and so connected together by the bevel-wheels *e* and the shaft *b* that the motion of either leaf is dependent upon the motion of the other one. For insuring the complete closing of both door-leaves before the lift can be raised or lowered, it is therefore but necessary to provide one of them with the device for locking the starting-rod *c*, and one with the door-locking mechanism, as is shown by the drawings. The latter mechanism in this case consists in the bolt *s* alone engaging with a notched piece, *t*, fixed to one of the leaves, and adapted to prevent the leaf from being moved when the bolt is in the notch.

I claim as my invention—

1. In a lift the floor-openings whereof are guarded by doors *d*, turning on axles, the combination, with a door, *d*, and the starting rod or rope *c*, of the sliding piece *h*, having a notch, *q*, and of the sector *a*, having the notch *m*, substantially as and for the purpose described.

2. The combination, with the door *d*, provided with sector *a*, arranged to engage with the sliding piece *h*, of a locking-piece, *r*, adapted to engage with the door by the action of a spring, and to be withdrawn from the door by the tappet *l* and the bolt *s*, substantially as and for the purpose specified.

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

MORITZ MARTIN.

Witnesses:
HENRY SPRINGMANN,
B. ROI.