(Model.)

5 Sheets—Sheet 1.

A. & J. M. SHEPHERD.

LIFT.

No. 545,315. Patented Aug. 27, 1895.

Fig. 1.

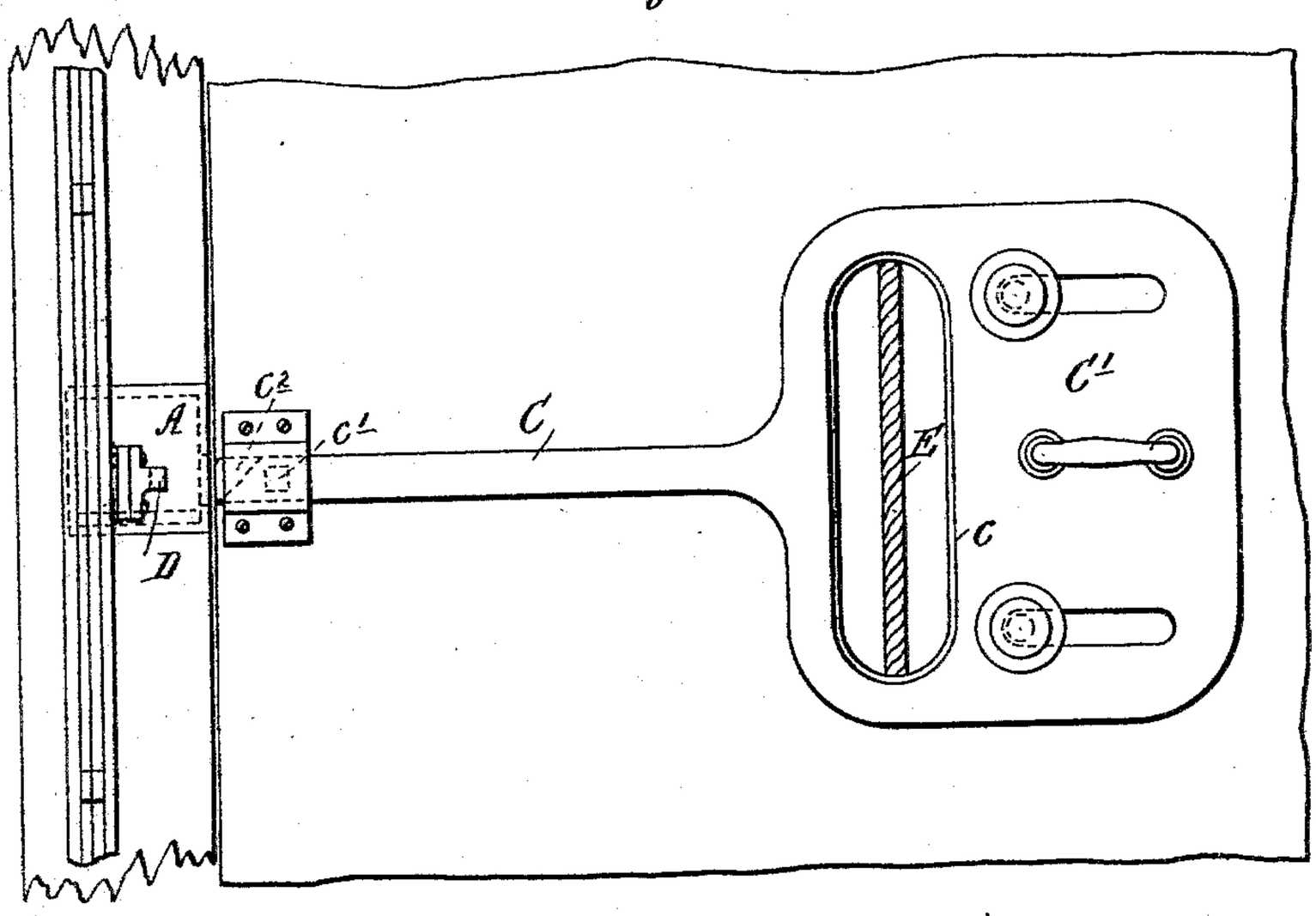
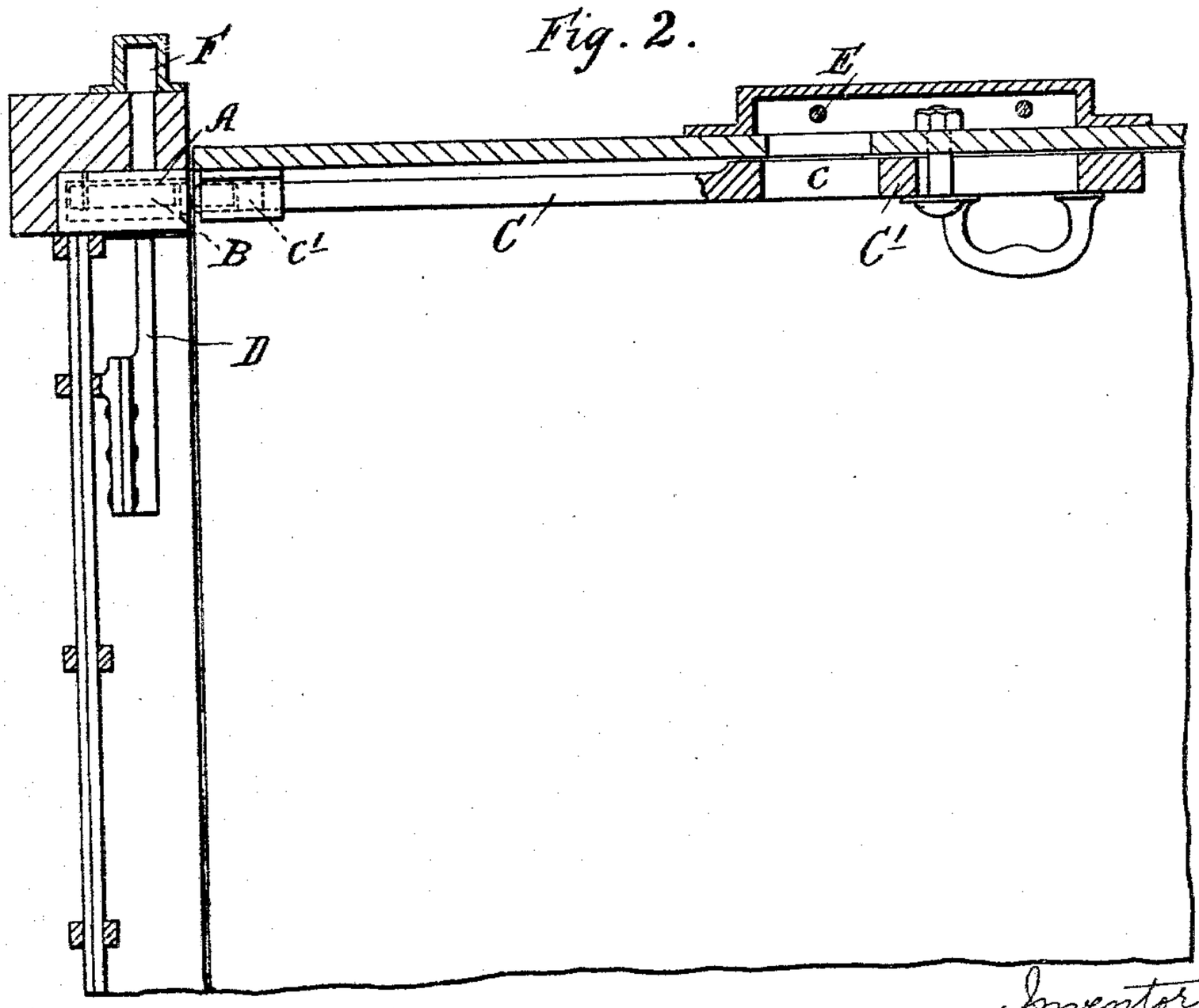


Fig. 2.



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LIFT.

No. 545,315. Patented Aug. 27, 1895.

Fig. 1a

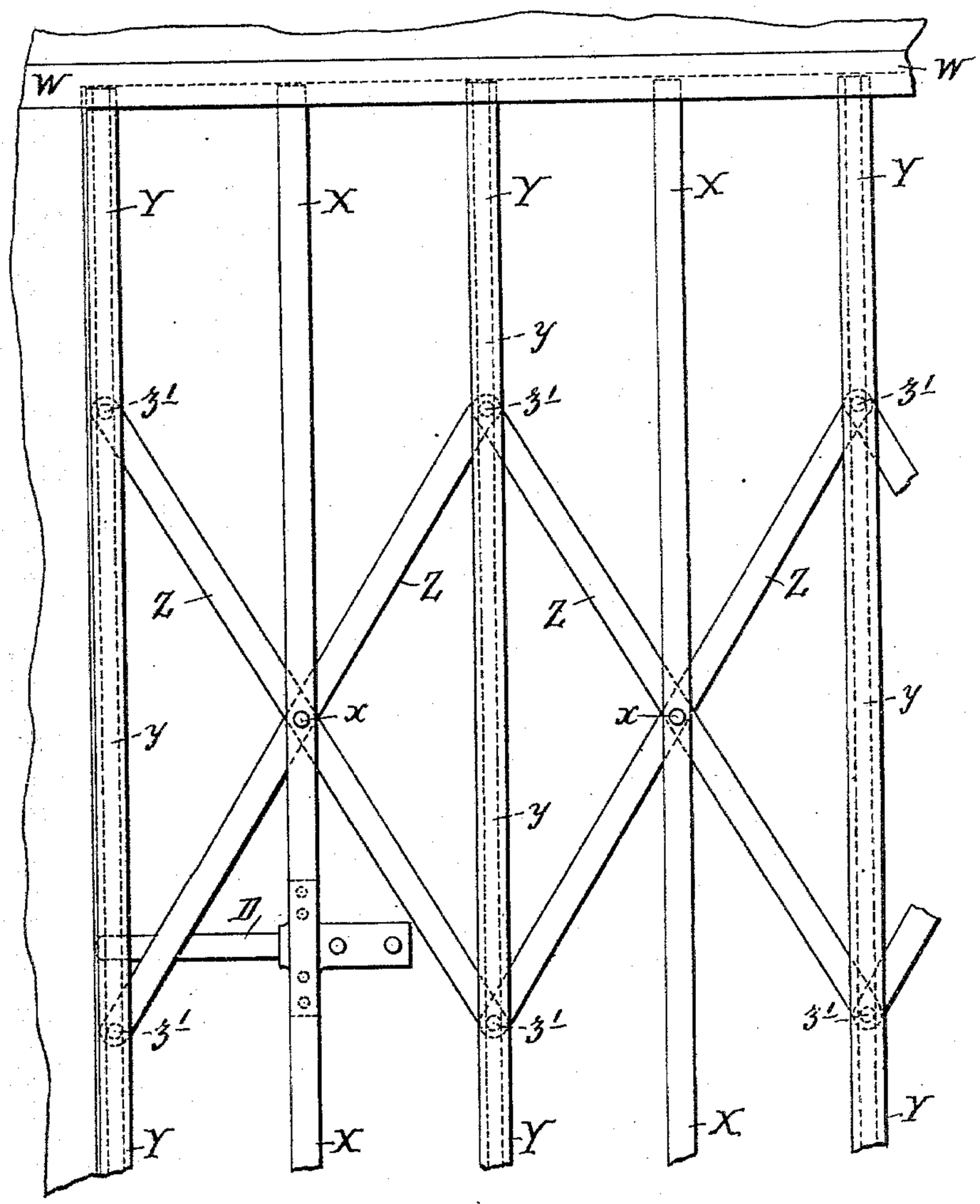
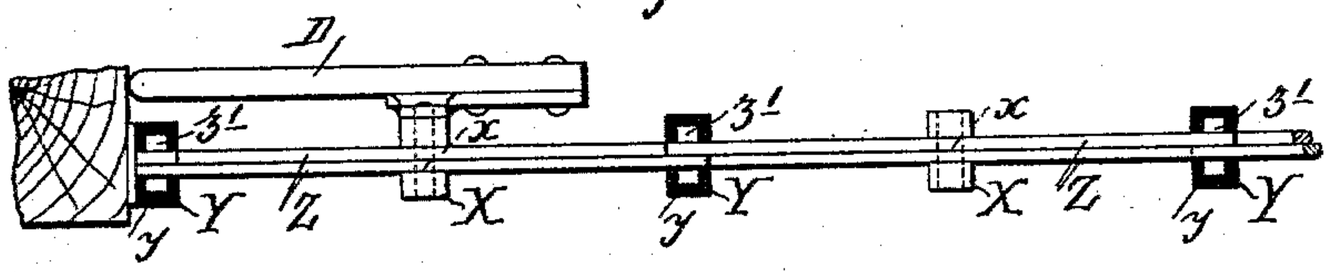


Fig. 2a.



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(Model.) 5 Sheets—Sheet 3.

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LIFT.

No. 545,315. Patented Aug. 27, 1895.

Fig. 3.

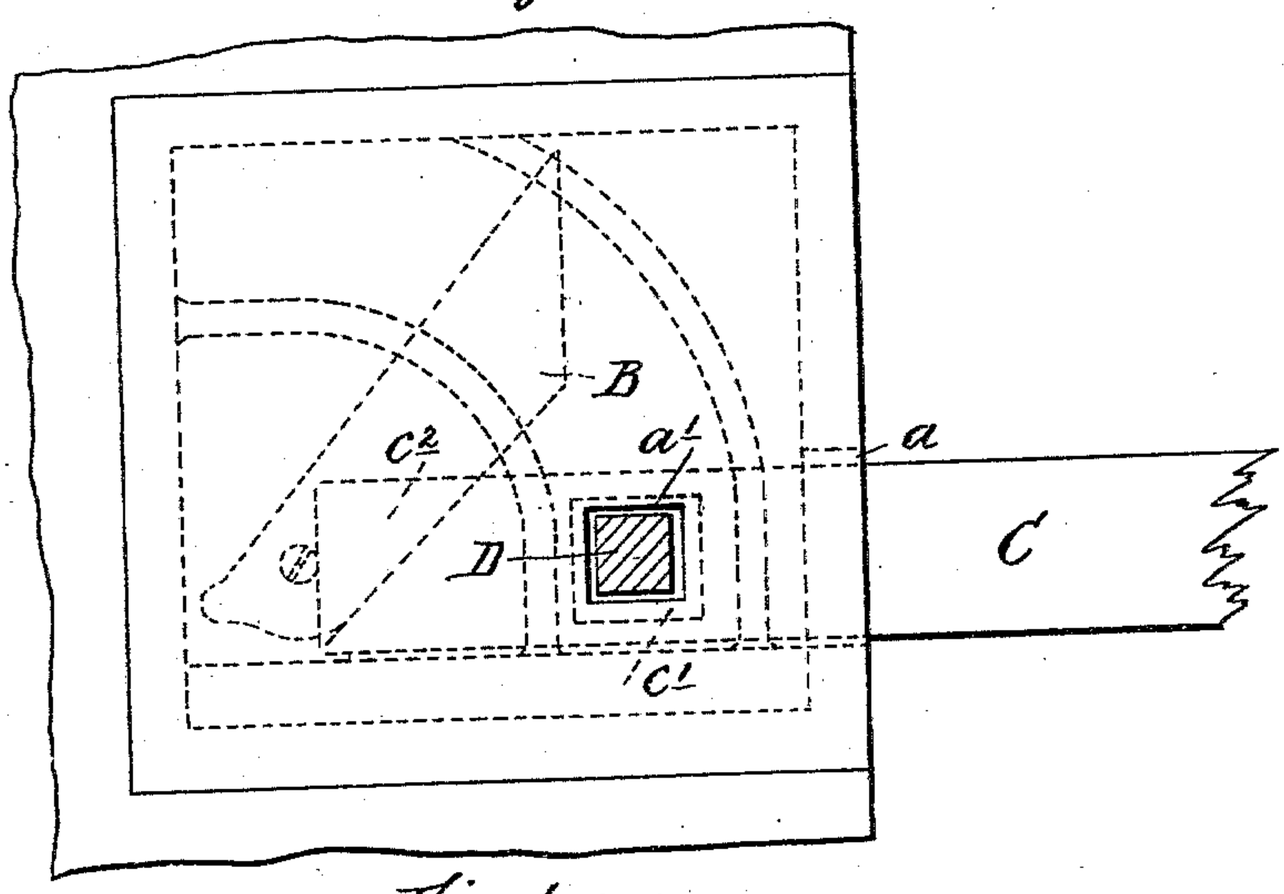


Fig. 4.

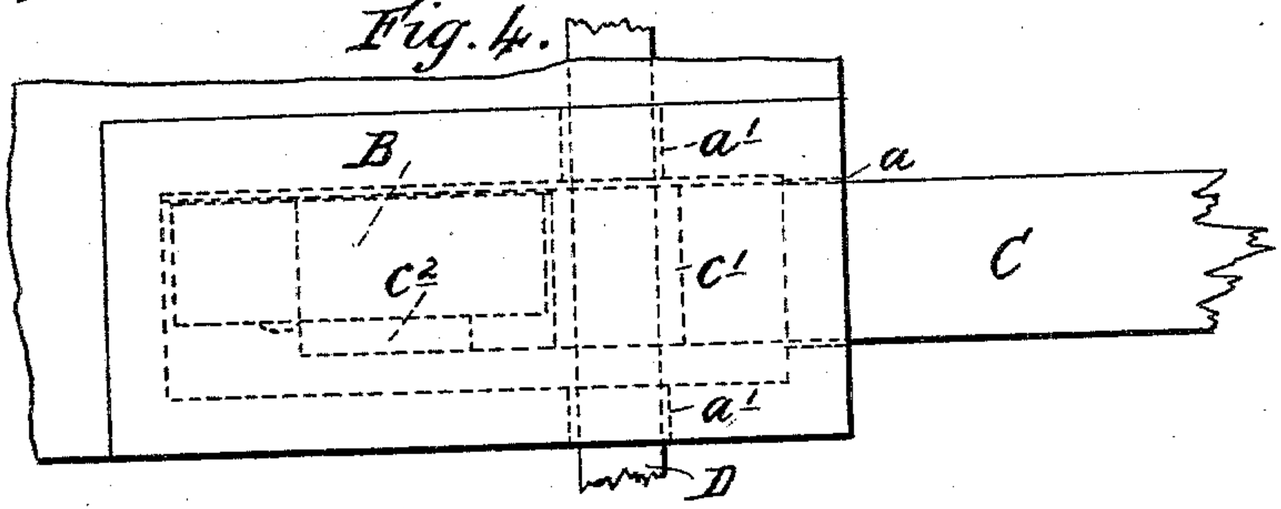
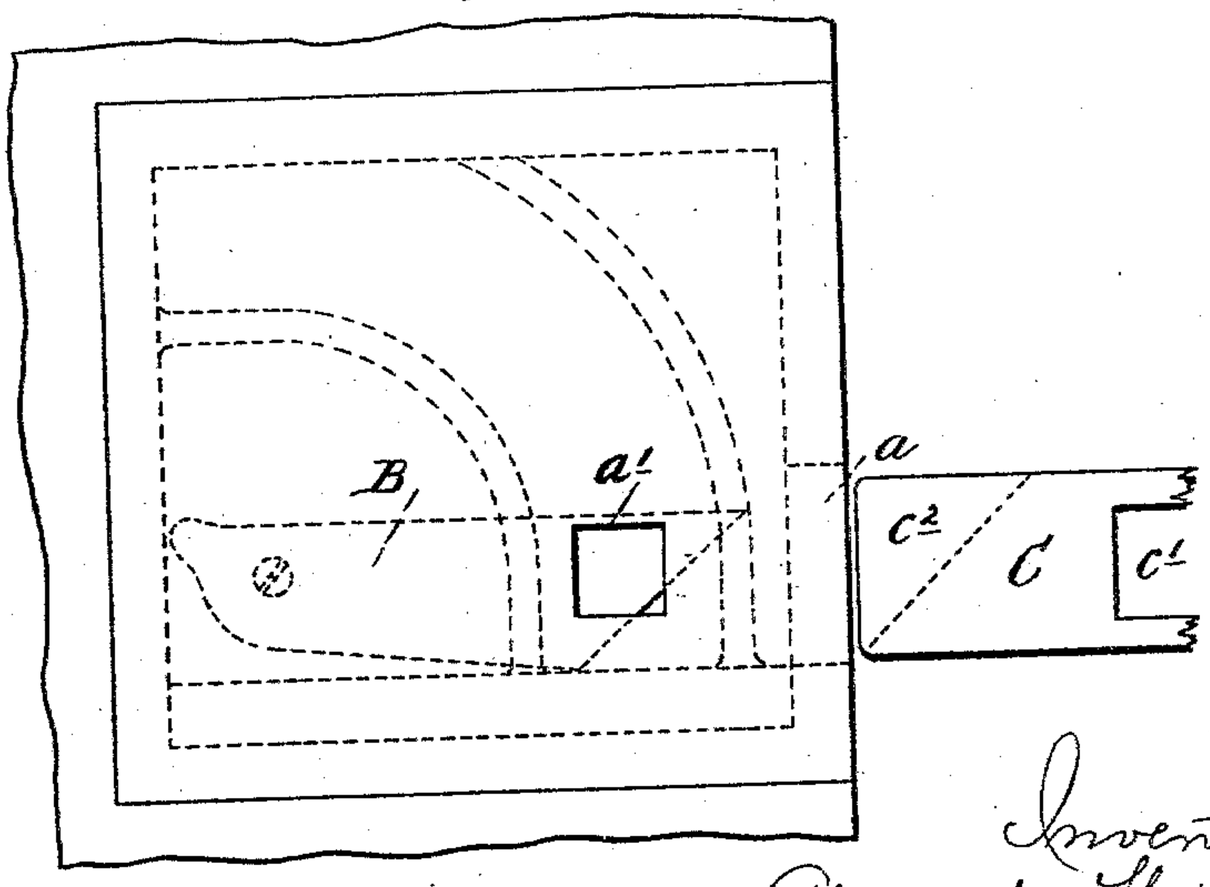


Fig. 5.



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(Model.) 5 Sheets—Sheet 4.

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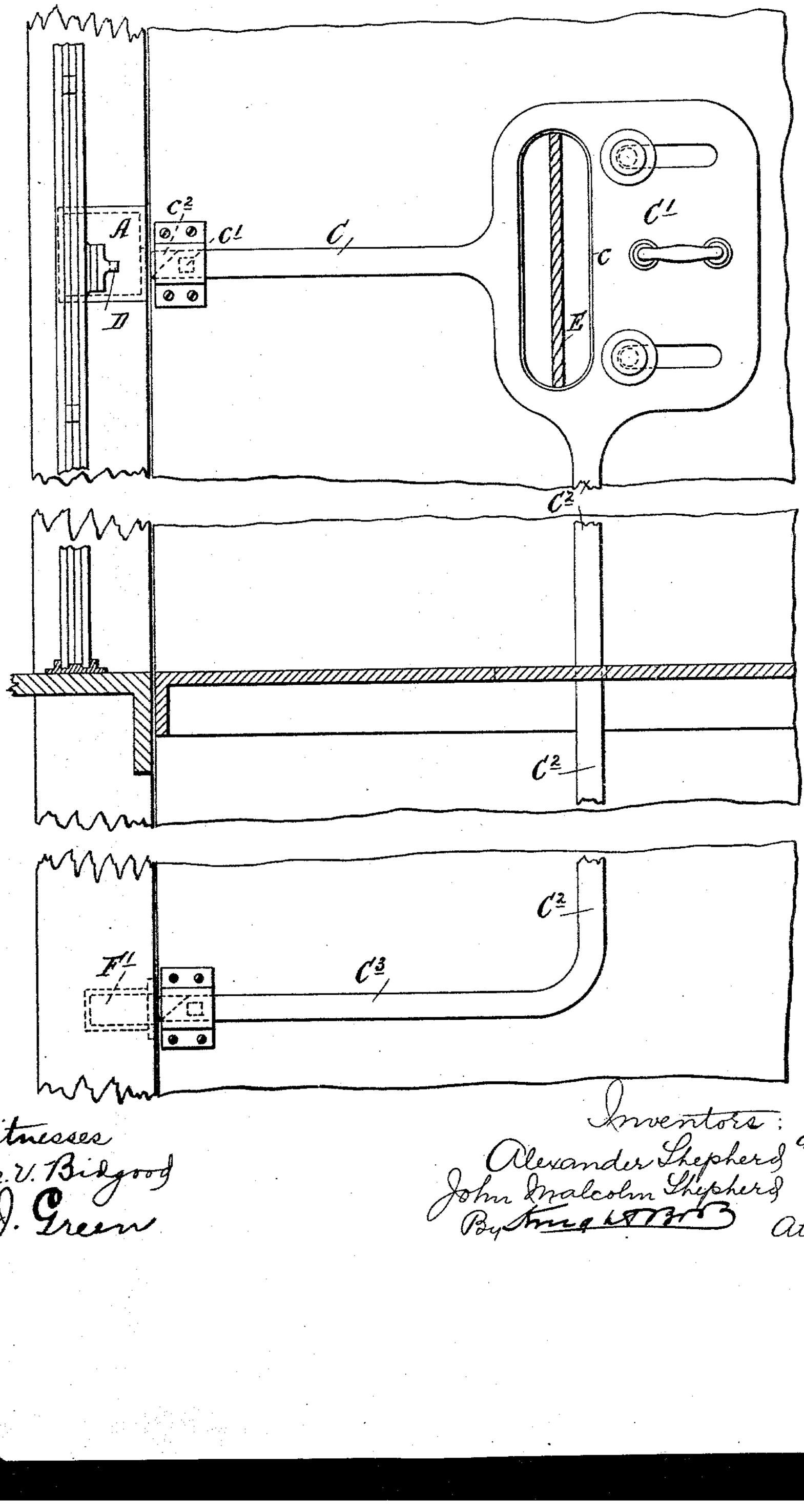
LIFT.

No. 545,315. Patented Aug. 27, 1895.

Fig. 6.



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(Model.) 5 Sheets—Sheet 5.

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LIFT.

No. 545,315. Patented Aug. 27, 1895.

Fig. 7.

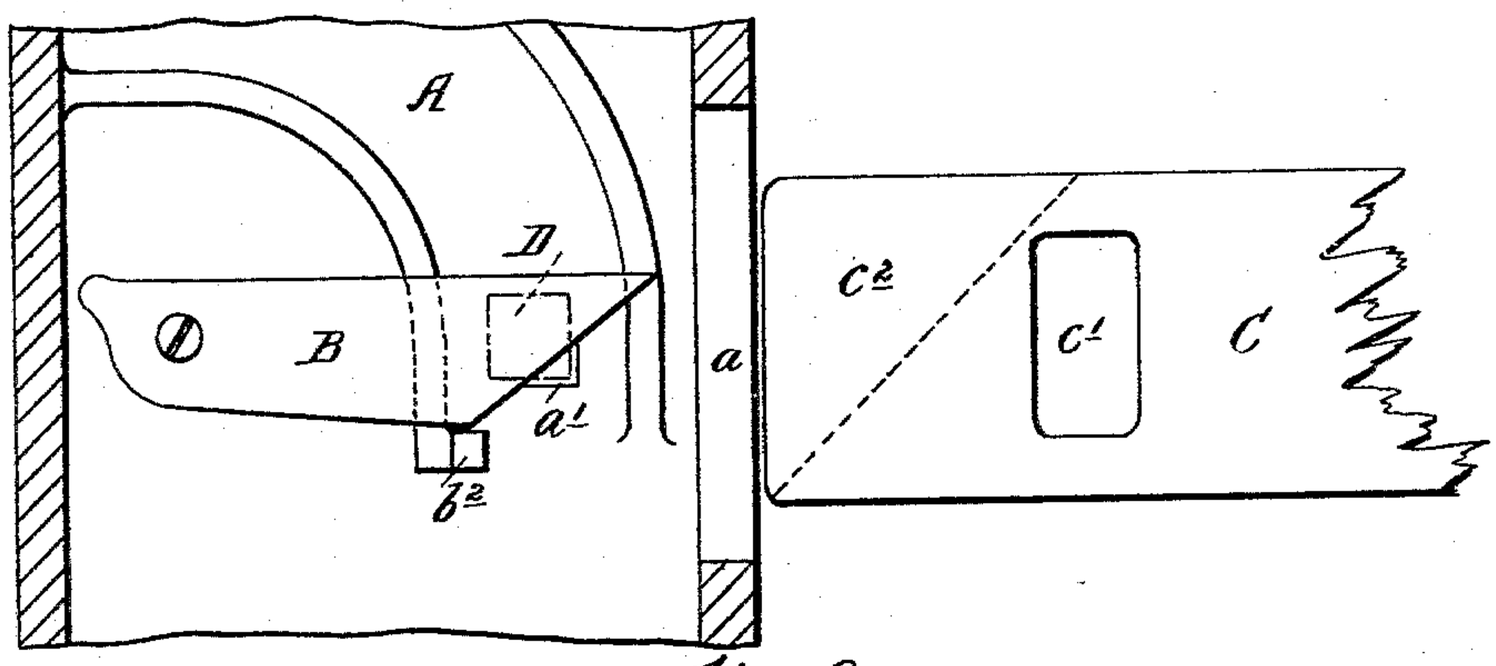


Fig. 8.

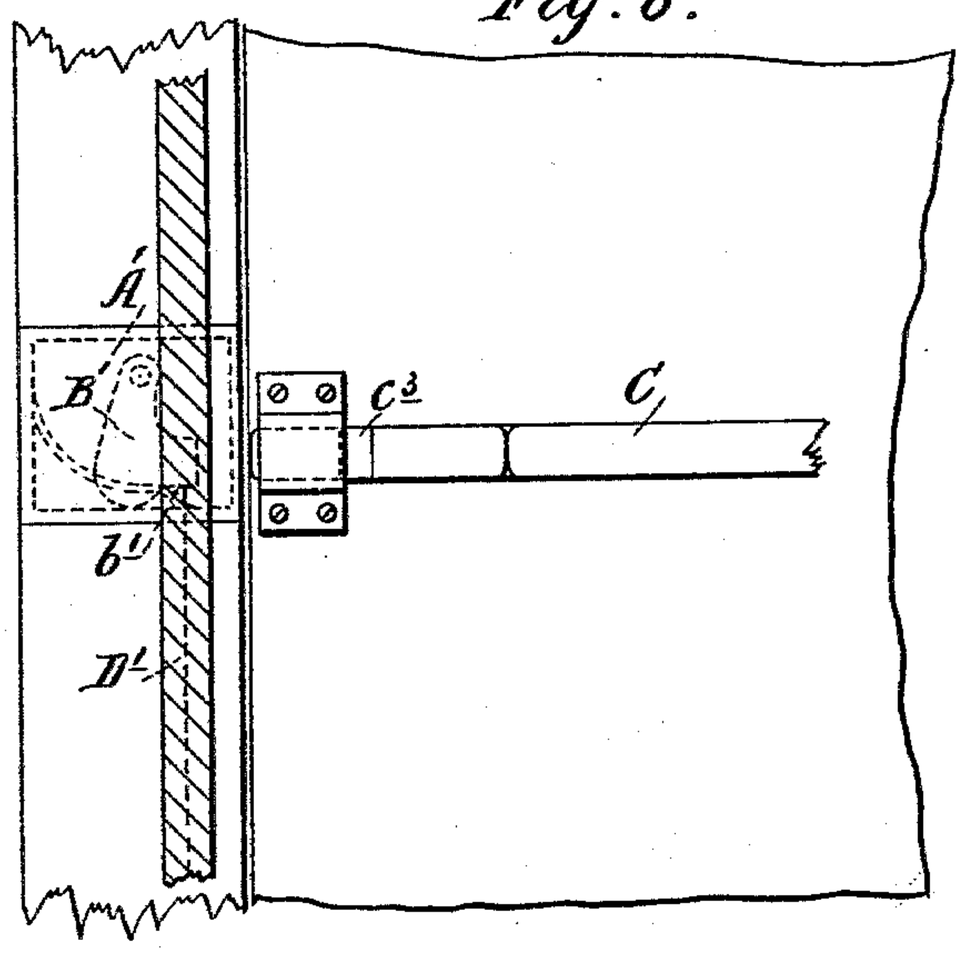
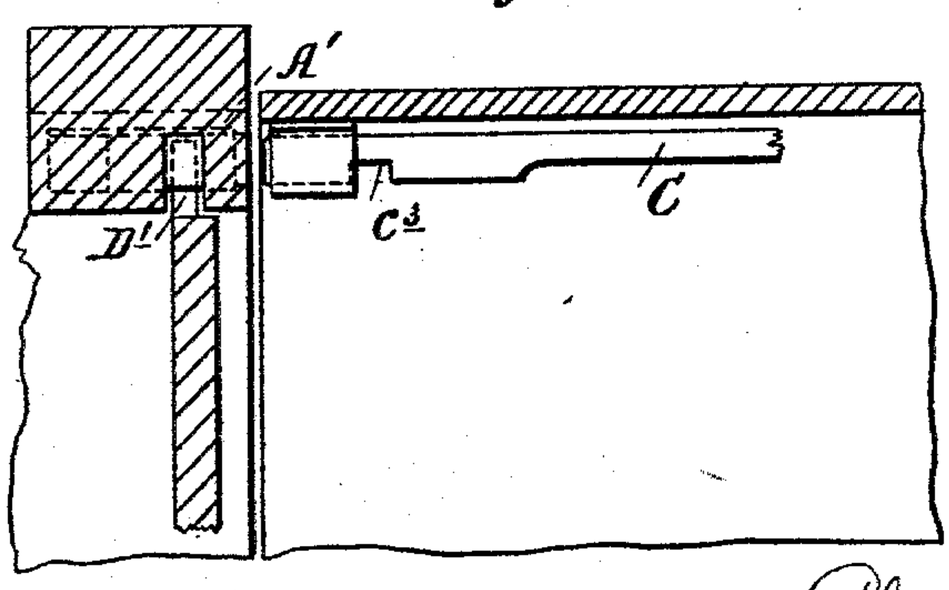


Fig. 9.



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UNITED STATES PATENT OFFICE.

ALEXANDER SHEPHERD AND JOHN MALCOLM SHEPHERD, OF EDINBURGH, SCOTLAND.

LIFT.

SPECIFICATION forming part of Letters Patent No. 545,315, dated August 27, 1895.

Application filed December 27, 1893. Serial No. 494,901. (Model.) Patented in England December 15, 1893, No. 24,161.

To all whom it may concern:

Be it known that we, ALEXANDER SHEPHERD and JOHN MALCOLM SHEPHERD, merchants, of 111 Princes Street, Edinburgh, in the county of Mid-Lothian, Scotland, have invented Improvements in Lifts, (for which we have obtained British Letters Patent No. 24,161, dated December 15, 1893,) of which the following is a specification.

This invention relates to improvements in lifts, and has for its object to minimize the possibility of accidents.

In accordance with our invention the doors in the various flats cannot be opened unless the lift is stopped opposite to them. The lift cannot again be put in motion until the door at which it is stopped be again closed, when it is locked until the next visit of the lift. The rope whereby the lift is worked is, if inside the lift, inclosed in a box, in which there is a hole cut large enough to allow of the hand passing through and working the lift. If the rope be outside the lift, a hole is all that is necessary. Over this opening a sliding shutter works, which when pushed over the opening entirely precludes the possibility of reaching the rope. To this shutter is attached a rod. Each door when closed is locked by an automatic bolt, which can only be raised by the rod attached to the shutter.

The said invention is applicable to all kinds of horizontal or vertical sliding doors, as well as to hinged or swinging doors of hoists, lifts, and the like.

Figure 1 is a part elevation, and Fig. 2 a part sectional plan, showing our invention as applied to horizontal sliding-lift door. Figs. 1ª and 2ª are, respectively, elevation and plan views of a part of such door. Fig. 3 is an elevation, and Fig. 4 is a plan, of the lock in its open position; and Fig. 5 is an elevation of the lock in its shut position. Fig. 6 is a part elevation showing our invention as applied to a hoist having a sliding door and a lower compartment of the cage for luggage. Fig. 7 is a modification of the lock arranged so as to enable it being operated, whether the cage be a little above or below the floor-level. Fig. 8 is a part elevation, and Fig. 9 a part plan, of the invention as applied to a lift-up door.

Referring to the said drawings, we suitably mount in one of the upright posts of the lift's framework a lock A, of a rectangular box shape, in which is pivoted a lead, iron, or other bolt B, the front end of which is beveled or inclined, so as to enable the front end, which is correspondingly beveled, of a sliding rod C to lift up the said bolt B, so as to permit of the door sneck or bolt D being passed through the lock, and so open or unfasten the door. The sliding rod C is formed or provided at its inner or rear end with a sliding shutter C′, which is formed with a hand-opening *c*, through which the operating-rope E of the lift may be actuated, said shutter C′ being mounted in such a manner that its opening *c* corresponds with the main opening for the rope E in the side or wall of the lift when the lock is shut and the door locked, and at the same time the shutter C′ is made sufficiently large, so that when the bolt or rod C is pushed into the lock, so as to unfasten the door, the rope-opening in the wall or side of the lift will be covered up, so as to prevent access being had to the rope E during the time that a door is open.

The collapsible or telescopic lattice-work door partly shown in elevation, Fig. 1ª, and in sectional plan, Fig. 2ª, is of the ordinary well-known construction. It is composed of a number of upright laths X Y, which slide in top and bottom grooves or channels W, said laths being arranged in pairs opposite each other, and each alternate pair of such is formed with internal channels *y*, in which the pins *z*′, connecting the extreme ends of the lattice links Z, slide up and down, the said links Z being pivoted at their centers to the plain laths X, as shown, by means of pivots or rivets *x*. The action of the said door is such that on one upright being moved to one side all the other uprights do likewise, except the stationary one, which is against the post of the framing of the hoist or lift. As long as one upright is prevented from being moved to the one side, none of the other uprights can be moved. It will thus be seen that so

long as the sneck or bolt D is retained in the normal position, as shown, the door is prevented from being collapsed or opened; but, on the lift coming opposite the door and the shutter C′ and rod C being operated so as to lift the bolt B of the lock A, the sneck or bolt D of the door can pass through the lock A and rod C, the door being thus left free to be collapsed or opened in the direction of the arrow.

The action of the foregoing is such that on the lift being brought opposite the door that it is desired to open, the operator pushes forward the shutter C′, so as to cover up the opening to the rope E. This pushing forward of the shutter C′ also causes the front end of the sliding rod or bolt C, which is attached to or is a part of the shutter, to pass through the opening *a* of the lock A, and lift up the pivoted bolt B into the position shown in Figs. 3 and 4, and so permit of the sneck or bolt D of the door being passed through the opening *a′* of the lock A and opening C′ of the rod C, (shown more particularly in Figs. 3 and 4,) so as to unfasten the door and so permit of it being opened. It will thus be seen that when the door is opened or unlocked the rope of the lift is covered up by the shutter C′, so as to prevent access being had to same for starting purposes, and the shutter C′ is kept in that position as long as the bolt D remains through the opening *c′* of the rod C—that is to say, as long as the door is open—thereby precluding the possibility of starting the lift as long as the door is open, since the shutter C′ and the door are interlocked. Likewise, when the shutter C′ is drawn back, so as to permit of access being had to the rope, no door can be open, as the end of the sneck or bolt D will only impinge against the side of the lock's bolt B, and so prevent the door from being opened—that is to say, the door is prevented from being collapsed or telescoped—owing to the said bolt B being in the position shown in Fig. 5—that is to say, lying across the openings *a′* of the lock through which the sneck or bolt D passes.

In order to prevent the lock's bolt B being tampered with when used in an open-framework lift, as shown, we provide a metal or other cup or cover F outside the post opposite the openings A′ of the lock A, as shown in Fig. 2, and to prevent the sneck or bolt D of the door being passed through the lock A before the shutter C′ has been moved sufficiently to cover up the opening for the rope E, we form or provide the front end of the sliding rod or bolt C with a projection or web c^2, against which the end of the sneck or bolt D would come if tried to be passed through the lock.

When our invention is applied to a lift in which the cage is provided with a separate portion for luggage, as is illustrated in Fig. 6, we form or provide the shutter C′ and the sliding rod C with a depending rod or arm C^2, the lower end of which, after passing through the floor of the cage, being provided with a corresponding sliding rod C^3, so as to enable the lift to be stopped or started either at or from the passenger or luggage level, this being effected by one or other of the sliding bolts or rods C C^3 working in recesses or hollow cups F′ in the wall—that is to say, the bolt which is not operating the lock A.

When it is desired to allow for the cage not being stopped exactly opposite or level with the floor, as is sometimes the case, we form the sliding rod or rods C, Fig. 7, of a broader section, and form the opening *c′* larger than the bolt D of the door, so as to permit of the sliding rod C entering into the lock A through the opening *a*, which is also made larger, and so actuate the bolt B of the lock A, the said bolt B being in this case kept in its normal position by means of a pin or projection b^2.

Our invention may also be applied to lifting or sliding up doors, as is illustrated in Figs. 8 and 9 of the drawings, in which case the bolt B′ of the lock A′ would be mounted vertically—that is to say, it would hang down from its pivot in such a manner as to permit of its lower end *b′* bearing on the top end of a rib or flange D′, which, in this case, forms the sneck of the door and extends down the side or edge of the door from the level of the lower end *b′* of the lock's bolts B to the bottom of the door, the sliding rod C and shutter being prevented from moving when the door is open by means of the flange or sneck D′ of the door engaging with and working vertically in a slit or groove c^8 formed in the sliding rod or bolt C, there being corresponding slits or grooves formed in the lock and upright for the flange or sneck to work in.

The foregoing thus provides an appliance for lifts, hoists, and the like, whereby the possibility of accidents is greatly diminished, owing to the fact that if a door is open the lift or cage has to remain in a stationary position opposite the said door until the door is closed and locked before the actuating-rope can be operated.

We claim—

1. The combination in a lift, hoist or the like, of a door having a bolt or sneck D, with a lock having a pivoted bolt B and a shutter C′ and rod C adapted to unlock the lock and be engaged by the bolt or sneck, substantially as set forth.

2. The combination in a lift, hoist or the like, of a door having a bolt or sneck D, the car having lower luggage compartment, the lock having pivoted bolt B, and the shutter C′, and rods C and C^3, substantially as set forth.

3. The combination in a lift, hoist or the like, of a door having a bolt or sneck D, a lock having a bolt B with inclined or beveled nose and adapted to lock the bolt or sneck D,

a shutter C′ adapted to close the rope opening, and a rod C extending from the shutter and adapted to engage the inclined nose of bolt B for releasing sneck D and formed with opening *c′* for engagement of sneck D, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALEXANDER SHEPHERD.
JOHN MALCOLM SHEPHERD.

In presence of—
JOHN D. KER,
JNO. E. GIBSON.