

(No Model.)

3 Sheets—Sheet 1.

H. I. COE & J. J. McBRIDE.
HATCH DOOR.

No. 548,606.

Patented Oct. 22, 1895.

Fig. I.

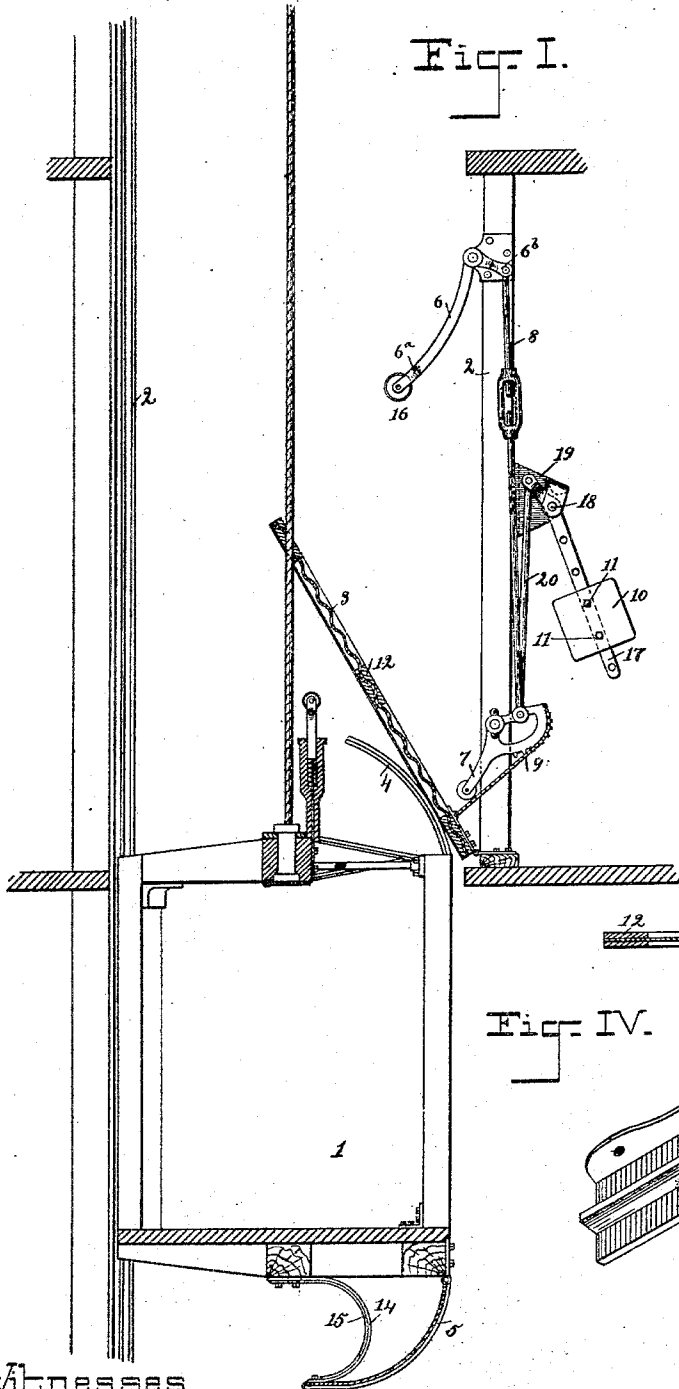


Fig. II.

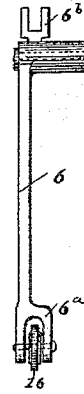
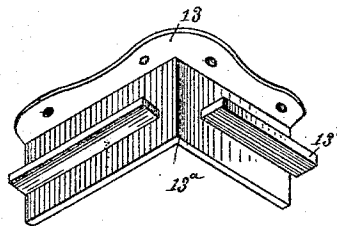


Fig. III.



Fig. IV.



Witnesses

Little Hanna
Mazie & Bidgood

Inventors

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(No Model.)

3 Sheets—Sheet 2.

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Fig-VI.

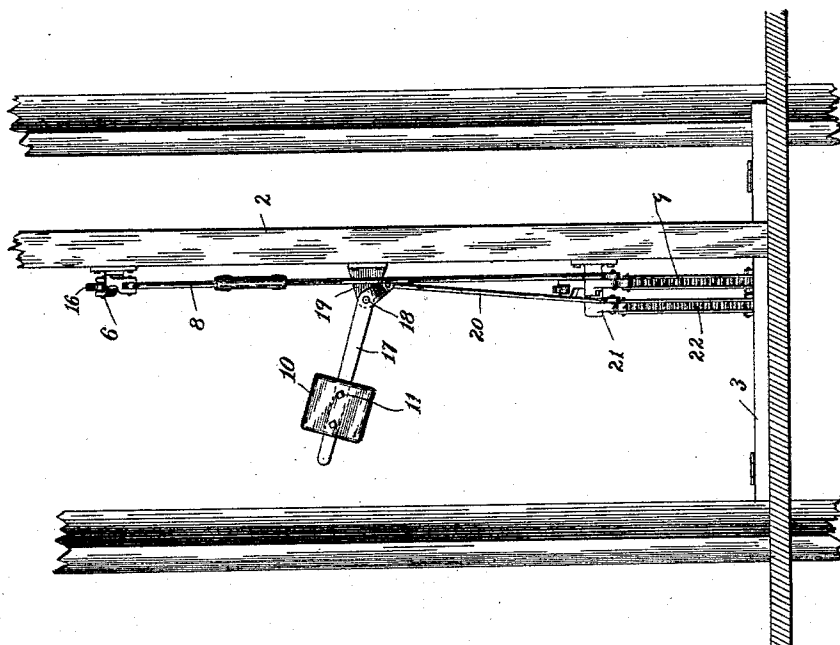


Fig-VII.

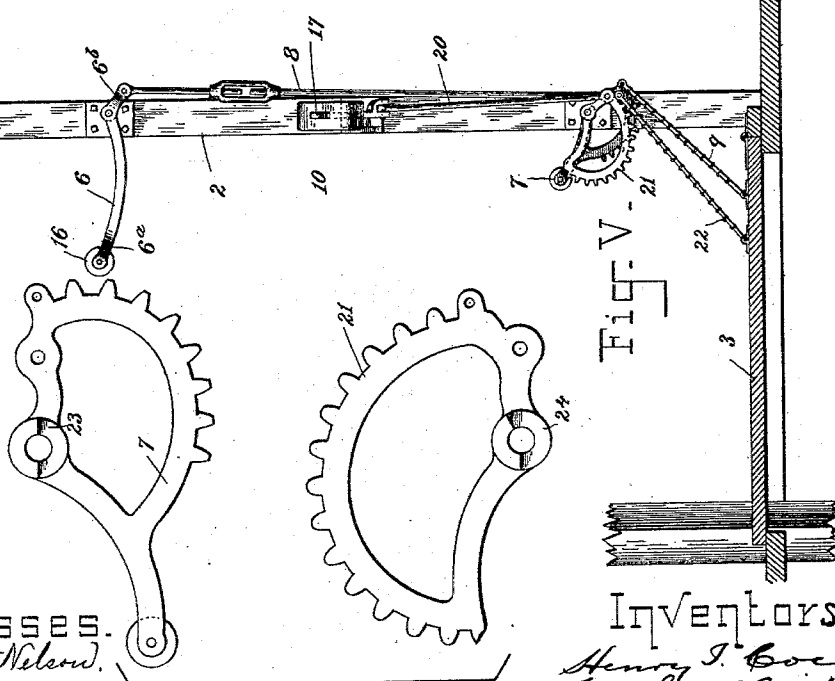


Fig-V.

Witnesses.

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Maxie V. Bidgood.

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John J. McBride
By [Signature] attys

(No Model.)

3 Sheets—Sheet 3.

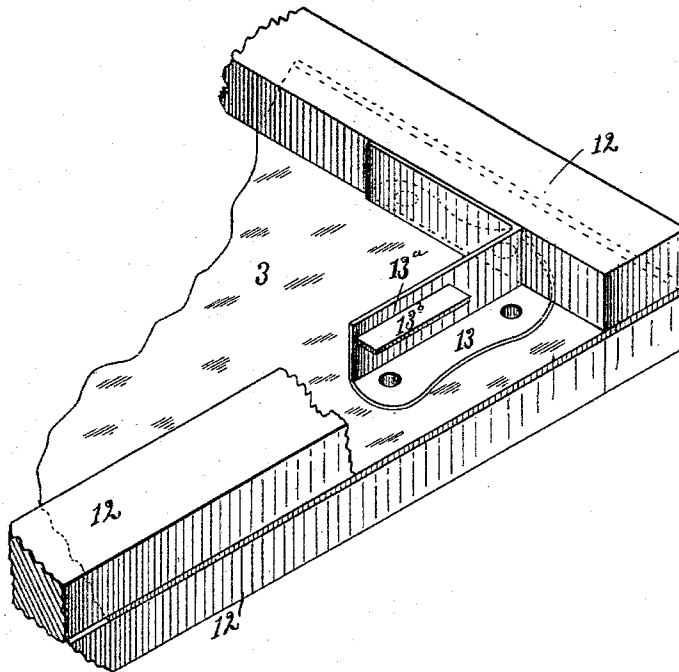
H. I. COE & J. J. McBRIDE.

HATCH DOOR.

No. 548,606.

Patented Oct. 22, 1895.

Fig VIII.



Witnesses

Lilli Hanna
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UNITED STATES PATENT OFFICE.

HENRY I. COE, OF ST. LOUIS, MISSOURI, AND JOHN J. McBRIDE, OF RIDGEFIELD PARK, NEW JERSEY; SAID McBRIDE ASSIGNOR TO SAID COE.

HATCH-DOOR.

SPECIFICATION forming part of Letters Patent No. 548,606, dated October 22, 1895.

Application filed May 10, 1890. Serial No. 351,290. (No model.)

To all whom it may concern:

Be it known that we, HENRY I. COE, residing at the city of St. Louis, in the State of Missouri, and JOHN JAMES McBRIDE, residing at Ridgefield Park, in the county of Bergen and State of New Jersey, citizens of the United States, have invented certain new and useful Improvements in Hatch-Doors, of which the following is a specification.

Our invention relates to safety hatch-doors for elevator-shafts; and it consists in the details of construction thereof hereinafter fully described, and set forth in the claims.

Figure I is a vertical section through an elevator shaft, cab, and hatch-door provided with our improvements. Fig. II is a side elevation of the operating-arm hereinafter referred to. Fig. III is a section of another form of hatch-door. Fig. IV is a detailed perspective view of an angle-piece. Figs. V and VI are elevations, at right angles to one another, of the preferred form of counterweight mechanism. Fig. VII is an elevation of the adjacent faces of the two sprocket arms or cams. Fig. VIII is a perspective view of one corner of our improved door, showing an angle-piece combined therewith.

The elevator-cab 1 runs in a shaft between uprights 2, and in passing up and down lifts the hatch-door 3 by means of mechanism which is substantially the same as that shown in Letters Patent No. 451,947, issued May 12, 1891, to J. J. McBride, and claimed therein as to the general features of construction and operation. It consists, essentially, of cams or bows 4 and 5, respectively on the top and bottom of the cab, and arms 6 and 7, pivoted at the side of the shaft and connected together by the rod 8, and also connected by chain 9 to the hatch-door. The top cam or bow 4 engages with the door and lifts it as the cab is rising. The under cam engages with the arm 6 as the cab is descending, and through the medium of rod 8, sprocket-arm 7, and chain 9 lifts the door.

Our present invention relates more particularly to the features of construction now to be described.

The arm 6 is provided at its lower end with roller 16, surrounded or bound, as shown, with

a solid rubber ring for engaging with the surface of the door and deadening the force of the shock and the noise of concussion, this being especially described in the construction shown, as the rod 6 is rigid and unyielding in operation. This arm has a bearing for the pivots of roller 16 and rod 8 in the enlarged portions 6^a 6^b at its ends, which are offsets from the main body of the arm. This enables the arm to be hung nearer the post, and thus the strain on it to be diminished. It will also be noticed that the offset on the lower arm when the latter is pressed back will strike against the rod 8, preventing the arm from passing the rod. Were the arm to be swung past the rod by a sudden blow given it by the operation of the under cam on the cab on the lever 7, it would be liable in its return movement to engage with the rod and become locked therewith, disarranging the parts.

The under cam 5 is made in the form of a bow hinged to the bottom of the cab at one side of the latter and held in place at its force end by a bow-spring 14, which may be strengthened by an additional or auxiliary spring 15. These springs are rigidly attached to and extend in a curve or bow from the bottom of the cab to the cam 5, where they are rigidly attached to the latter. This gives a compact construction, noiseless and easy in action. The cam is thereby also held steady and in the proper direction.

The form of door which we prefer to use on account of its lightness consists, as shown, of the sheet-metal plate, which may be corrugated, as shown in Fig. I, or plain, as in Fig. III, clamped between wooden battens or framing-pieces 12. These battens or framing-pieces may be fastened together with screws or rivets or by an angle-piece 13, (shown in Fig. IV,) whose angle 13^a fits in a corner of the wooden frame, while the ribs 13^b occupy gains cut in the edges of the battens. This gives a strong joint and enables a light wooden frame to be used.

The above-described form of door may be used either as a hinged hatch-door or as a carrying hatch-door, as shown, respectively, in Figs. I and III.

In case the sheet metal of the door is corrugated the wood battens may be similarly corrugated to fit them.

We provide a counterweight for the door of such construction that it may be readily adjusted to balance the door and so arranged as to occupy little space and be perfectly noiseless in action. 10 is the counterweight, adjustable by screws or bolts 11 on a lever 17, which is pivoted at 18 to a bracket 19, fixed to the building. A rod 20 connects the short inner arm of lever 17 with sprocket-arm 7. The arrangement and shape of the lever and the length of the rod 20 are such that the counterweight will oppose the most resistance to the weight of the door as the latter approaches a horizontal position—that is to say, when most of the latter's weight is taken off of its hinges. A preferred form of this counterweight mechanism is shown in Figs. V, VI, and VII. Here the counterweighted rod 20 is connected to a sprocket-cam 21, separate from the door-lifting sprocket-lever or nose-cam 7, but mounted on the same pivot. The shape of the cam 21 is so proportioned as to keep its chain 22 taut and cause the counterweight to act efficiently on the door at all positions. The main object of using a separate sprocket-cam for the counterweight, as here shown, is to enable the chain 22 to be fixed farther out on the door than chain 9, thus bettering the leverage of the counterweight on the door. The arrangement, also, takes strain off chain 22 when door is almost up or down and regulates and steadies the movement of lifting machinery.

It will be seen that as the door is raised by nose cam or lever 7 the chain 22 will be slackened, allowing the sprocket-cam 21 to turn on its pivot and the weight 10 to fall. As the weight approaches a perpendicular position near the rod 20 the door approaches a position directly over its hinges and striking the nose of lever or cam 7 frees it back, so that lever 6 is withdrawn completely from the shaft out of the way. To allow for this extra movement of the nose lever or cam, the two sprockets are allowed to move independently on their pivot. This result may be accomplished by having no connection between them or by having their bearings shouldered together with slight freedom of movement, as shown at 23 24, Fig. VII. Such an arrangement renders the movement regular and prevents slam of the door. When desired, the two sprockets

may be mounted on separate pivots in different locations in the elevator-shaft.

There is a special object in this case in making the doors of wood and metal combined. The wood battens stiffen the metal doors and prevent them becoming misshapen when subjected to heat. They are especially well adapted for elevators having automatically-operated door-opening devices because of their stability.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. In elevator hatch-door operating mechanism, the combination with the door-lifting rod 8; of the arm or lever 6, having housings for the anti-friction roller, and for the connection of said rod, off-set on one side, so that when the lever is down the off-set or housing for the anti-friction roller will impact on the rod 8, and be arrested thereby; substantially as set forth.

2. In combination, with a hatch-door and suitable operating devices; a lever having a counterweight; said lever being connected to the door by means of a rod, a chain and sprocket-cam, substantially as set forth.

3. The combination of a hatch-door, operating lever or arm 6, nose-cam or arm 7, rod 8, chain 9, counterweight 10, lever 17, rod 20, sprocket cam 21 and chain 22 arranged and adapted to operate; substantially as set forth.

4. The combination, with the hatch-door; of the nose-cam 7, chain connecting the cam with the door, the rod 8, the lever 6, the bracket 19, the weighted-lever 17, and the rod connecting the weighted lever with the nose-cam; substantially as described.

5. The combination, with the hatch-door; of the nose-cam 7, chain 9, rod 8, lever 6, weighted lever 17, rod 20, cam 21, and chain 22; the cams having shouldered connections 23, 24, substantially as described.

6. The combination with the cab having a cam made in the form of a bow and hinged to the bottom of the cab at one side of the latter; of the bow-shaped spring secured rigidly to the bottom of the cab and also secured rigidly to the lower end of the cam; substantially as shown and described.

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JOHN J. MCBRIDE.

Witnesses:

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