

C. O. YALE.  
Hatchway-Door Mechanism.

No. 205,940

Patented July 9, 1878.

Fig. 1

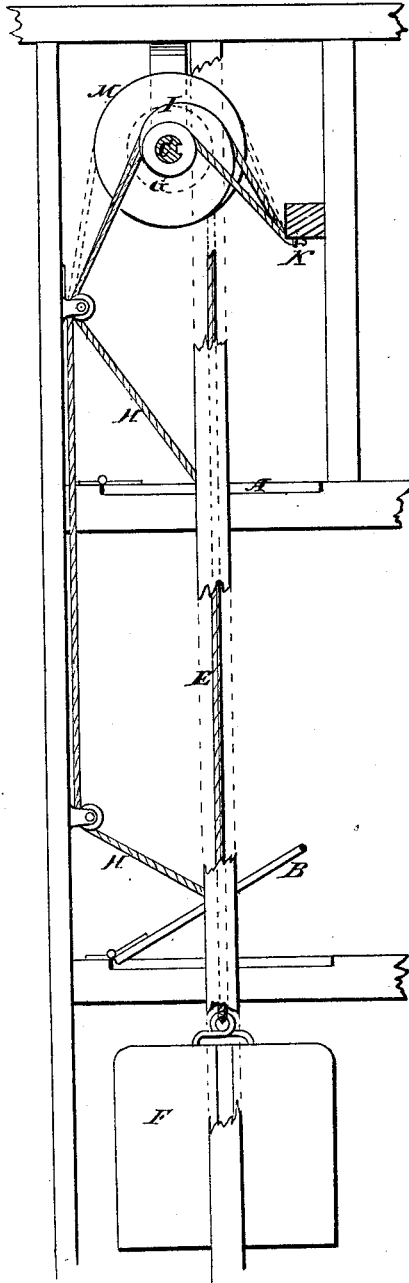


Fig. 2.

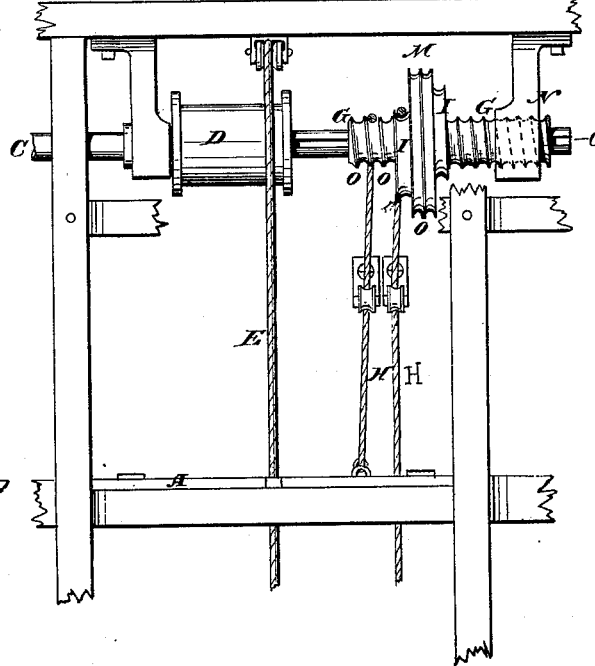
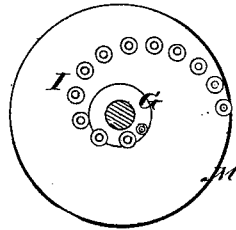


Fig. 3.



Witnesses  
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## IMPROVEMENT IN HATCHWAY-DOOR MECHANISMS.

Specification forming part of Letters Patent No. **205,940**, dated July 9, 1878; application filed February 21, 1878.

*To all whom it may concern:*

Be it known that I, CHARLES O. YALE, of the city, county, and State of New York, have invented certain new and useful Improvements in Mechanism for Opening and Closing Hatches, whereof the following is a specification:

My invention consists in the combination, with the cords or chains for opening the hatches, of a wheel that is caused to pass under the said cords successively, the latter being arranged transversely to the axis of said wheel, and lifted and lowered as the wheel passes under them; also, in the combination with the wheel, of guides or guiding grooves for guiding the cords as the wheel passes under them from perimeter to perimeter; also, in the combination with the wheel, of a lifting device for lifting and lowering the cords from and to a point near the wheel's axis, and laying the cords on and taking them from the periphery of the wheel; also, in the combination, with the wheel on both sides thereof, and preferably on the same axis, of drums for maintaining the cords under tension while the hatches are closed, such drums, or their equivalent, having suitable guides or guiding-grooves for guiding the cords and presenting them properly to, and receiving them from, the lifting device; also, in the arrangement of the hatch-door machinery, substantially such as above indicated, and hereinafter more fully described, upon the main or drum shaft of the hoisting-gear.

Referring to the annexed drawings, which illustrate my invention, Figure 1 is a general view of a hatchway having mechanism applied thereto embodying said invention. Fig. 2 represents a front elevation of such machinery, showing more fully its application to the drum-shaft of a hatchway hoisting-gear. Fig. 3 is a modification of the lifting device, for lifting and lowering the cords or chains that operate the hatches.

A B represent the doors or hatches of a hoistway. C is the main or drum shaft of the hoisting-gear, having the usual drum D, on which is wound the hoisting-rope E, to which rope is attached the weight or car F. M is a wheel adapted to revolve on its axis, and also to move longitudinally with its axis.

H H are cords or chains attached to the

hatchway-doors, for operating or opening and closing them. The doors are preferably opened by a positive motion obtained from the drum-shaft C, and allowed to close by their own gravity. The cords or chains H are arranged in guiding-rollers along the wall of the hatchway, and their upper ends are carried across a drum or drums, G, and made fast to a beam or some stationary part of the frame-work. The drums G are affixed to each side of the larger drum or wheel M, the periphery of which holds up the cords H while the hatches are open, and when closed the smaller drums G maintain the cords under such light tension as to prevent their slackening. The hatches or doors are opened and closed by lifting and lowering the cords H, through means of a lifting and lowering device, operating in connection with the drums G and M, which are splined fast to their shaft by a groove, c, in the side of the shaft, and a key or feather within the said drums, so that G G and M may move longitudinally on the shaft while rotated by it. The longitudinal motion is produced by a suitable spiral or cam groove working in connection with a corresponding part, M, of the frame. Combined with said wheel or drum M and drums G are guides O, which guides practically hold the cords or chains H in one place, but allow them free play through or over the guides, so that as the said drums and wheel travel along on their axis they will pass under the cords, and the latter move back and forth freely when in the act of being raised and lowered. The guides on the drums G are constructed and adapted for leading and presenting the cords to and taking them from the lifting device, and those on the drum or wheel M serve a like purpose, as the wheel passes under the cords from one perimeter thereof to the other.

The device shown in the drawing for lifting and lowering the cords or chains H is substantially a ledge, I, in the form of a scroll or volute placed on the sides of the wheel M, and to co-operate properly with the guides on the drum or drums it is grooved like them.

An alternative device consists of a roller or rollers, arranged in a similar manner on the sides of the wheel M, and so as to operate properly with the drums G. When one such

roller is used, the diameter thereof must be such as to occupy about the space between the drums G and the periphery of the said wheel; but where a number of small rollers are used they may be arranged in the figure of a volute or scroll, as illustrated in Fig. 3.

In the drawing, the mechanism for operating the hatches is placed directly on the main or drum shaft C of the hatchway hoisting-gear, whereby such mechanism is much simplified; but the general principles of my invention as to other features would not be affected by the use of additional shafts or other machinery.

From the foregoing description it will be understood that when the cords H are on the periphery of the wheel M the doors are open, and when they are on the drums G the doors are closed; also, that the several doors or hatches are consecutively opened and closed by successively operating with the same wheel on the several cords that connect with the different doors, which is automatically accomplished by the hatchway hoisting-gear in the act of raising or lowering the weight or car F.

I claim as my invention—

1. The combination, with the cords or chains for operating a series of hatchway-doors, of a

wheel adapted to travel longitudinally on its shaft, and act upon the several hatch cords or chains successively, for holding the respective hatch-doors open as the load ascends or descends through the hatches.

2. The combination, with a traveling wheel at the sides thereof, and moving on the same shaft, of devices for lifting or lowering the hatch-cords, for opening and closing the hatches, respectively, as the load ascends or descends through them.

3. The combination, with the traveling wheel and lifting devices at the sides thereof, of drums for maintaining the cords under proper tension while the hatches are closed, as set forth, each having guides or guiding-grooves for the cords, substantially as specified.

4. The arrangement and combination, with and upon the main or drum shaft of a hatchway hoisting-gear, of a complete mechanism for opening, holding open, and closing the hatches consecutively and automatically as the load passes through the hatchway.

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Witnesses:

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