

G. N. Creamer,

Hatchway.

No. 100,265.

Patented Mar. 1, 1870.

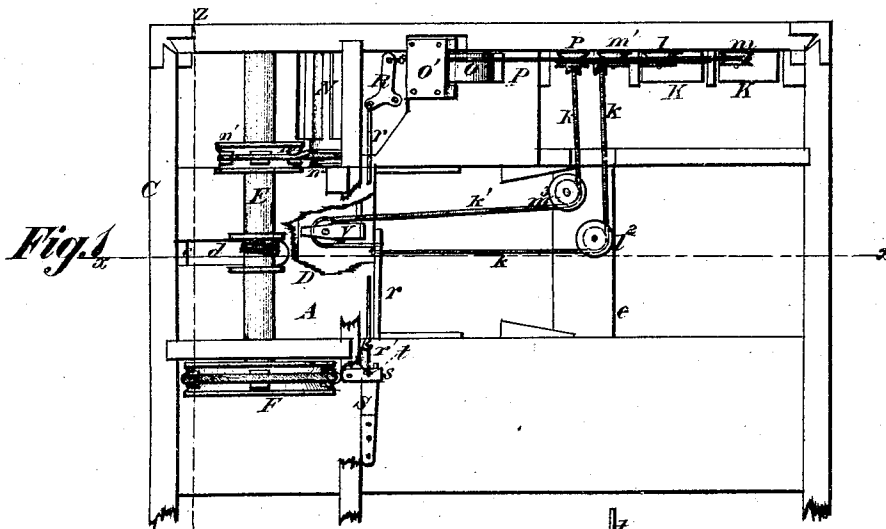


Fig. 1

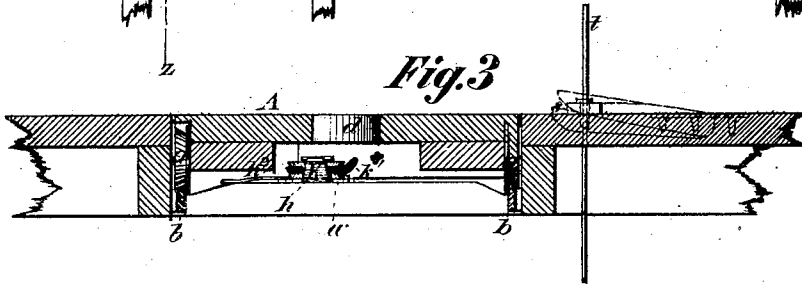


Fig. 3

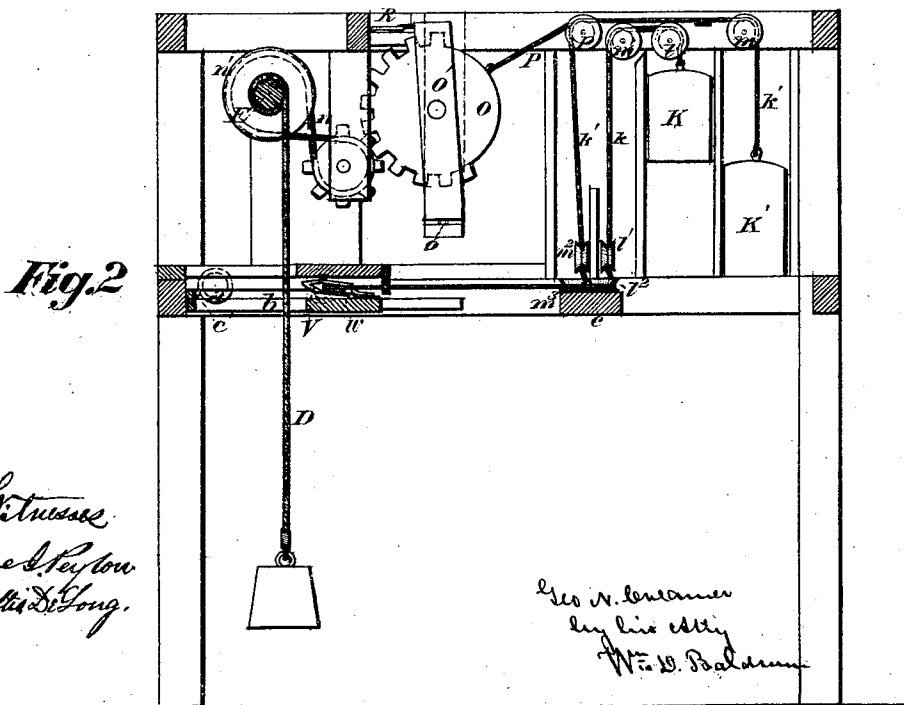


Fig. 2

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GEORGE N. CREAMER, OF TRENTON, NEW JERSEY.

Letters Patent No. 100,265, dated March 1, 1870.

IMPROVEMENT IN SELF-ACTING HATCHWAY-HOISTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE N. CREAMER, of Trenton, in the county of Mercer, and State of New Jersey, have invented certain new and useful Improvements in Self-Acting Safety Hatchway-Hoists; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan or top view of the skeleton-frame of a portion of a building to which my improvements are applied;

Figure 2 represents a view of the same, partly in elevation and partly in section, at the line $x x$ of fig. 1; and

Figure 3 represents a vertical transverse section through the same at the line $z z$ of fig. 1.

I have shown my apparatus applied to a two-story building, that being sufficient to illustrate the invention, though it may be applied to any number of floors by mere reduplication of the pulleys, cords, locking-tumbler, and weights.

For the details of construction of the hatch I need only refer to my application for Letters Patent of even date herewith, as they form no part of the invention herein claimed.

It is the object of the first part of my improvements to arrange the mechanism for operating the hatchway-hoist, so that it may not in any manner obstruct the use of the floors for ordinary purposes.

It is the object of the second part of my invention to combine the hoisting apparatus with the hatch, so that the hatch may be opened and closed by the same power which works the rope for hoisting, and it is in this sense that I designate my invention as self-acting.

It is the object of the third branch of my invention to provide for operating the hoist and the hatch simultaneously or independently, as may be desired; and

The improvement for this object consists in a device for throwing the hatch-operating mechanism into or out of gear with the hoisting apparatus.

The hoisting-rope D is wound around and depends through the hatch from the windlass E , arranged at the upper part of the building in the ordinary manner.

On the shaft of the windlass E I secure a pulley, upon which I wind the rope for operating the windlass E , which rope depends on each side of the drum in the usual way, through suitable openings made in the floors near the hatchways.

Toward the other extremity of the shaft of the windlass E I affix upon this shaft a pulley, n^1 .

In a suitable frame, O' , depending from the joists, I mount a drum-wheel, O , (which has cogs on, say, one-half of its perimeter,) in such manner that the cogged drum-wheel O may rock (on a pivot, o) toward and from the windlass E .

A smaller drum-wheel, N , having cogs on its entire perimeter, is mounted in suitable bearings and so located as to mesh in gear with the cogs on the perimeter of the wheel O when it is rocked toward the windlass.

On the end of the drum-wheel N a pulley, n^2 , is mounted in line with the pulley n^1 on the shaft of the windlass.

The pulleys n^2 n^1 being connected by a driving-belt, it will be seen that, as the windlass is turned in either direction, the drum-wheel N is also rotated correspondingly, and thus the hoist may be made to impart motion to the hatch-operating mechanism, as hereinafter described.

On the back cross-piece of the hatchway I secure two lugs $V V$, in which is pivoted a horizontally-slotted casting with a projecting nose. The preponderance of weight in this casting is in front of its pivot, that is, toward the hatchway. A spring is fixed beneath this casting to assist in depressing it when the hatch is closed. In the slot of this casting a horizontal pulley, w , is secured. This constitutes the locking tumbler, the operation of which is hereinafter more fully described. (See figs. 1 and 3.)

Beneath the floor and at a distance from the hatchway equal to the length of the hatch I attach to a cross-piece, e , a little apart from each other, two horizontal pulleys l^1 m^2 , and under the floor and near the wall I mount two corresponding but vertical pulleys l^2 m^1 , in line respectively with the pulleys l^1 m^2 . Above these pulleys l^1 m^2 I mount upon the joists and parallel with the joists two pulleys, m^1 and p , the pulley p being somewhat higher on the joists than the pulley m^1 .

Next to the pulley m^1 , away from the windlass, and in line with it I mount upon the joists and parallel with it a pulley, l , and still further away in the same direction I mount in like manner a pulley, m , in line with the pulley p .

Under the pulleys l and m above described I place against the wall two upright boxes or frames, reaching a suitable distance from the floor, and in these boxes respectively the weights K and K' are guided up and down. Attaching a cord, P , of suitable length to the cord k , which supports the heavy weight K' by one end, I carry the other end of it up over the pulley m , along the joist, to and over the pulley p , and fasten the cord to the smooth surface of the drum-wheel O .

The weight K' thus keeps the drum O out of gear with the wheel N .

The cord k is fastened by one end to the back edge of the hatch, and carried forward to and around the pulley w in the locking-tumbler, then back to and around the pulley m^2 , across to and under the pulley m^2 , and up to and over the pulley p , toward the pulley m , and between the pulleys p and m the cord P is

spliced to it. A third cord, *k*, is attached by one end to the lighter weight *K*, and passes over the pulleys *l* *m*, down to and under the pulley *l*, across to and around the pulley *l*, and forward to the back end of the hatch to which it is fastened.

To the rocking-frame *O*' of the drum-wheel *O* a bell-crank, *R*, is connected by a link.

A link-rod, *r*, connects this bell-crank with a similar one *r*'.

Rods or cords, *t*, attached to the lower arm of the bell-crank *r* pass down through the floors to any point from which it is desired to operate the hatch.

On each floor, through which this cord *t* passes, a foot-brake or forked treadle, *S*, is pivoted and provided with a spring which keeps it up, but which yields readily to pressure, so that, by simply placing the foot upon this brake, the cord or rod *t* will be pulled, and the bell-crank turned by the bite of the brake.

The operation of the above-described mechanism is as follows:

To raise the weight shown in the drawings, the rope *D* is wound up on the windlass-shaft by rotating the drum-wheel *F* in the ordinary manner. When the weight approaches a hatch which it is desired to open, the operator, continuing to haul on the side rope, presses down the treadle or brake *S* with his foot, thus causing it to bite on the rod *t*, and pulling down the bell-crank so as to draw the drum-wheel *O* into gear with the pulley *n*² on the shaft of the cogged drum *N*. The pulley *n*¹ on the shaft *B* driving the pulley *n*², the drum-wheel *O* is rotated so as to wind up the cord *P* upon it, thus lifting *K*, the heavier of the two weights, in its box. As this weight *K*' is lifted the cord *k* is slackened, and its tension being thereby released from the pulley *w*, this pulley *w*, aided by the spring, depresses the locking-tumbler on its pivot and unlocks the hatch, the weight *K*' continuing to be held up by the drum-wheel *O* so long as pressure remains on the foot-lever or treadle *S*.

The weight *K* being thus relieved from the weight *K*', now descends in its box, and, as it descends, draws the cord *k* back with it, through, around, and over the pulleys *l*, *l*, and *l*, and thereby pulling the hatch open, the slack of the cord *k* being taken up as the cord *k* is drawn taut.

So soon as the drum-wheel *O* has made half a revolution, its cogs being passed and its smooth perimeter presented to the cogs on the wheel *N*, the wheel *N* continues to turn without turning the wheel *O*, and this prevents the weight *K*' from being drawn out of its box and over the pulleys, as would happen but for this provision being made to obviate that result.

A button is placed so as to slip over the treadle *S*, and hold it down whenever it is desired to keep the hatch open, without detaining the operator to hold it with his foot.

The load having passed through the hatch, the operator simply removes his foot so as to release the treadle *S*, which is instantly thrown up, whereupon the weight *K*', being heavier than the weight *K*, descends in its box, unwinding the rope *P* from the drum *O*, drawing taut the cord *k*, around the pulley in the locking-tumbler, thereby drawing the hatch forward again and closing it, (and at the same time raising the weight *K*, as the cord *k* is drawn forward with the hatch,) and when the hatch is closed the weight *K*' produces sufficient tension on the pulley *w* to raise the locking tumbler and securely lock the hatch.

The weight *K*' also draws the drum *O* back on the pivot *o*, and thus throws it out of gear with the drum *N*, so that the rope may be lowered for another load, or, if it be desired to lower anything, the operation above described is repeated, the arrangement of the

cog-wheels *N* and *O* being adapted equally to move in either direction with the same effect.

It will be seen that through this system the hatch may be opened and closed by rotating the windlass and pressing on the treadle, whether anything is being hoisted or not, and that it may be operated from any part of a building to which the rod and foot-lever is connected.

What I claim herein as new, and desire to secure by Letters Patent, is—

1. The combination of the hatch and the operating mechanism of the hatch with the hoisting apparatus, so as not to obstruct the floors, substantially as and for the purpose described.

2. The combination of the hatch and the operating mechanism of the hatch with the hoist, so that the same power which raises the bulks may at the same time operate the hatch, substantially as described.

3. The combination with the hoist of the hatch and the mechanism for operating the hatch, so that the hoist may raise or lower and the hatch open or close simultaneously or independently, substantially as described.

4. The combination with a hoist of a horizontally-sliding slotted hatch, substantially as and for the purpose set forth.

5. The combination with the hoist of the horizontally-sliding slotted hatch and the locking-tumbler, substantially as and for the purpose described.

6. The combination with the hatch of the weights *K* *K*', cords, pulleys, and foot-treadle, whereby the hatch is made to open automatically.

7. The self-opening and self-closing and locking hatch, substantially as described.

8. The combination with the hoist of the cogged wheel *N* and partially cogged drum *O*, whereby the action of the gearing is rendered intermittent, substantially as and for the purpose described.

9. The combination with the hoist of the wheels *N* and *O*, the bell-crank and the rods or cords for throwing the mechanism into or out of gear, substantially as described.

10. The combination with the bell-crank, rods, or cords, cog-wheels *N* and *O*, and foot-lever of the button for keeping the mechanism in gear without detaining the operator for that purpose, substantially as described.

11. The combination with the hatch of the weights *K* *K*', the system of pulleys and cords, the gearing and the bell-crank and treadle mechanism, when all arranged and operating substantially as herein described.

12. The rocking frame *O*' for the drum *O*, as and for the purpose described.

13. The combination with the hatch of the reversible gears *N* and *O*, in such manner that they will operate the hatch whichever way they are rotated, substantially as described.

14. The combination with the hoist of the pulleys *n*¹ *n*, the cog-wheel *N*, and the sector cog-wheel *O*, mounted on the rocking frame *O*', substantially as and for the purpose set forth.

15. The combination of the cord *P*, the weight *K*' and the cogged drum *O* mounted in the rocking frame, substantially as and for the purpose described.

16. The combination with the cord *P* and weight *K*' of the cord *k* and its pulleys, substantially as and for the purpose described.

In testimony whereof I have hereunto subscribed my name.

GEORGE N. CREAMER.

Witnesses:

HENRY BALDWIN, Jr.,
E. N. MILLER.