

I. D. SPAULDING & M. W. TUTTLE.

Closing Hatchways.

No. 154,196.

Patented Aug. 18, 1874.

Fig. 1.

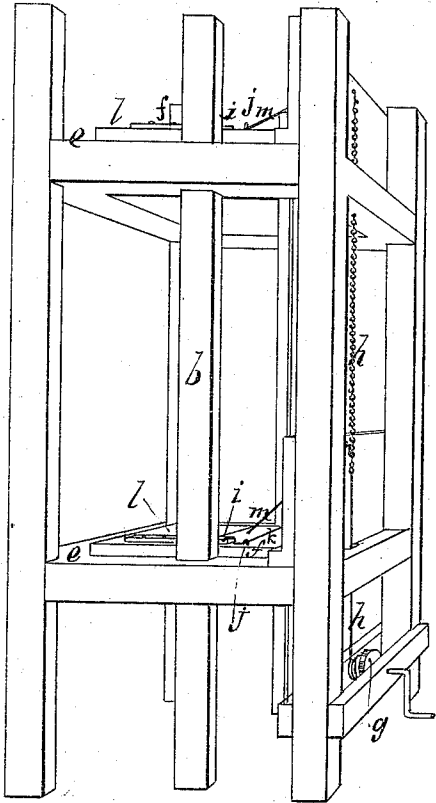
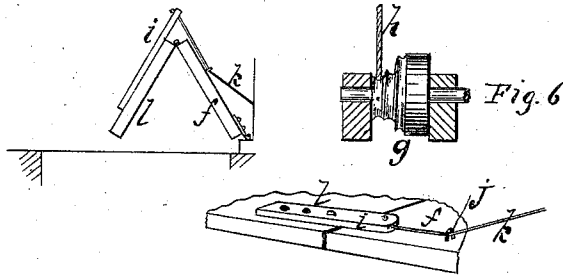
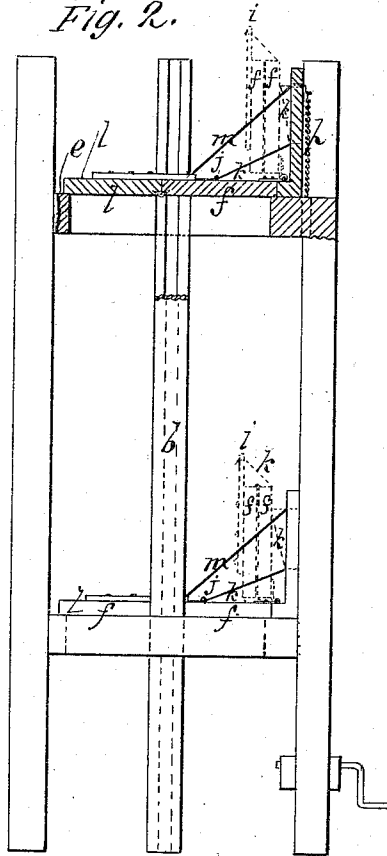


Fig. 2.



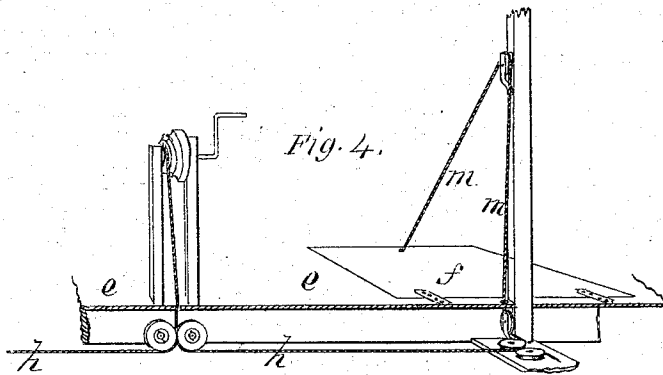
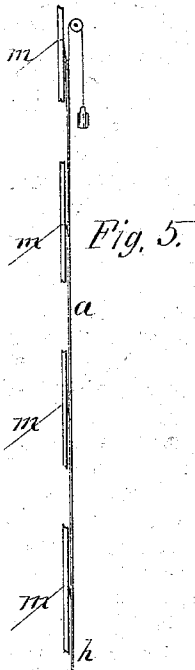
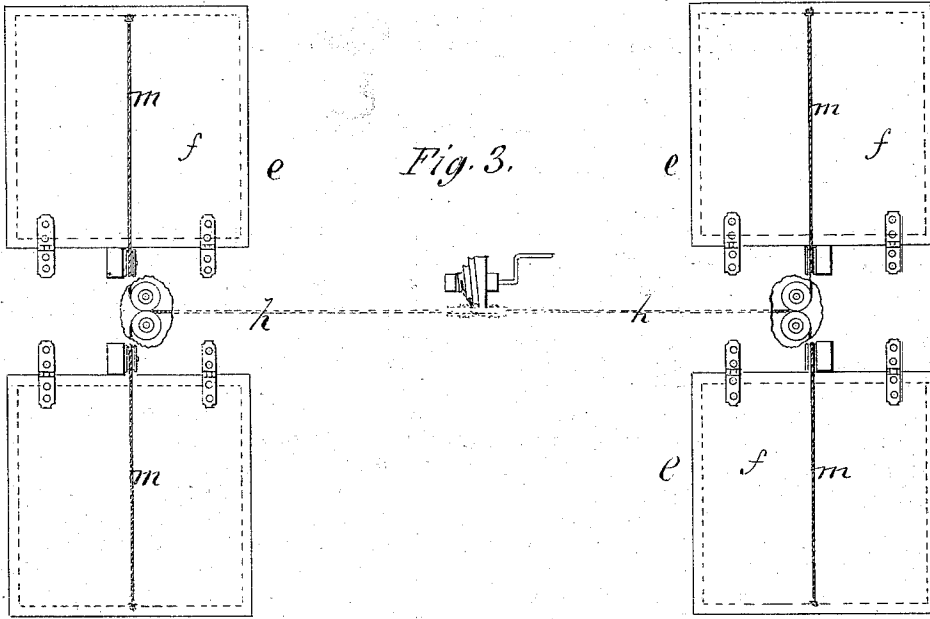
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# UNITED STATES PATENT OFFICE.

IRA H. SPAULDING AND MARTIN W. TUTTLE, OF BOSTON, MASSACHUSETTS,  
ASSIGNORS TO IRA H. SPAULDING, OF SAME PLACE.

## IMPROVEMENT IN CLOSING HATCHWAYS.

Specification forming part of Letters Patent No. 154,196, dated August 18, 1874; application filed  
April 18, 1874.

*To all whom it may concern:*

Be it known that we, IRA H. SPAULDING and MARTIN W. TUTTLE, both of the city of Boston, county of Suffolk and State of Massachusetts, have invented Improvements in Mechanism for Opening and Closing Hatches, of which the following is a specification:

The nature of our improvements relates to the construction of the covers and the operating mechanism for opening and closing hatches, substantially as hereinafter more fully set forth and described with reference to the accompanying drawings, which form a part of this specification, of which—

Figure 1 is a perspective view of two floors, each provided with a hatch and covers, and mechanism for operating the covers to open and close the hatches. Fig. 2 is an elevation, partly in section, of the same. Fig. 3 shows a plan of four hatches and their covers, all arranged upon the same floor, with the mechanism for operating them all simultaneously, or a part of them at once, as desired. Fig. 4 is a view of the farther right-hand one of this group of four hatch-covers, the floor being shown partly in section, and exposing that part of the mechanism located beneath the floor as well as that above. Fig. 5 illustrates the use of a rod or pipe, *a*, as a connecting-rod, to which are attached the branch lines or chains or wires from each hatch. Fig. 6 is a detail view, illustrating the spiral or differential barrel, by which I attain the properly-graduated power adapted to the varying force required to open the hatches.

The usual guide-pieces for platform-elevators are, in the drawings, marked *b*. The floors are marked *c*. The hatch-covers are marked *f*.

One of the objects of our invention is to apply a proper graduation of force to the lifting of the several covers, so that at the beginning, when the hinged covers lift heavily, they may be lifted slowly, so consuming a reasonable amount of power or force; but when they are partly open, or gradually after they begin to open, their movement is accelerated in proportion as their more elevated or lifted position causes them to lift more easily. Another object is to cause the hatch-cover to fold up

at the same time, and so present less obstruction to the free circulation of air and light; and to accomplish these objects in a simple and efficient manner is the purpose of this invention.

Where the hatches are arranged on different floors, or in different stories of a building, we provide a differential drum or barrel, located at a convenient point above or below, or intermediate. On this drum *g* we wind a chain, rope, wire, or other flexible connection, and lead it through suitable guides or sheaves in proper proximity to the hatches to be operated. To each hatch-cover *f* we attach a branch line, *m*, and so lead it through guides, or over or around sheaves, as to permit it, in opening the hatch, to move in a corresponding direction to that of the main line, chain, wire, or cord *h*, or rod *a*. The scroll or differential barrel *g* is provided with a crank-gear or other means for turning it by hand or other power, so as to wind up the main line *h*, beginning on the small part of the scroll, and winding on the increasing diameter of the scroll-barrel as the covers begin to lift, thus causing them gradually to lift easier, till fully open.

When it becomes desirable to fold the covers into less space than they would occupy when hinged and turned up on edge to their full width or length, we divide them into two parts, as illustrated in Figs. 1 and 2. We hinge the parts together, and furnish the outer free part with a projecting arm or lever, *i*, which, when closed, lies close upon the surface of the cover; and to this arm *i* we attach a sub-line chain or other flexible connection, *k*, passing it through a guide, *j*, on the part of the cover other than that to which the arm *i* is fixed, fastening it to some stationary object. We then attach the branch line, which leads from the main line or connection *h* to the cover, to the hinged portion of the hatch-cover near the joint at which the free portion is hinged to it.

When the main line is drawn, it draws the branch line, which, passing through a guide or sheave somewhat elevated above the cover, causes the cover to lift first at the middle joint. This causes the cover to fold as it lifts. (See

Figs. 1, 2, and 6.) When the scroll-barrel *g* is turned in the opposite direction, unwinding the connection *h*, the hatch-cover lowers away upon its hinges, and the sub-line or flexible connection *k* begins to draw upon the arm *i*, causing the lower edge of the free part *l* of the cover *f* to swing out, as shown in Fig. 6.

The branch lines or connections *m* are connected to the main connection *h*, and to the cover, by a hook or other conveniently-detachable connection, so that they can easily be unhooked or disconnected whenever it is desired to leave one or more of a series of hatches or hatch-covers inoperative while one or more others are being operated.

If the branch lines *m* are made of combustible material, the hatches will become self-closing by the burning of the connections in case of fire occurring accidentally in the building, so helping to check its progress. The same may be said of the main line *h*.

The divided and hinged hatch-cover lifted

by attaching the line near the division-joint, as illustrated in Figs. 1 and 2, is a means of saving power, the cover being lifted with less power and in less time, in consequence. This results from a larger proportion of the weight of the cover being thrown upon its hinges and from the smaller circular arc through which the center of gravity of the cover is required to move.

I claim—

1. The scroll-barrel, the main connection, and branches, in combination with the series of two or more hatches and their covers, substantially as described.

2. The sub-line *k* and arm *i*, in combination with the divided and hinged or jointed cover, substantially as described.

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