

(No Model.)

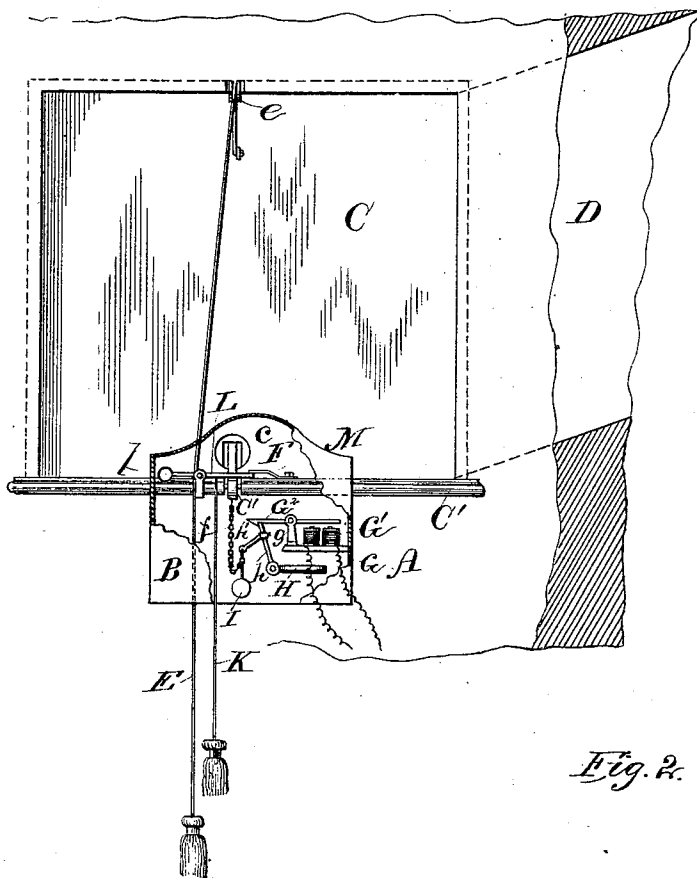
C. A. WILLARD.

SMOKE AND FLAME OUTLET FOR BUILDINGS.

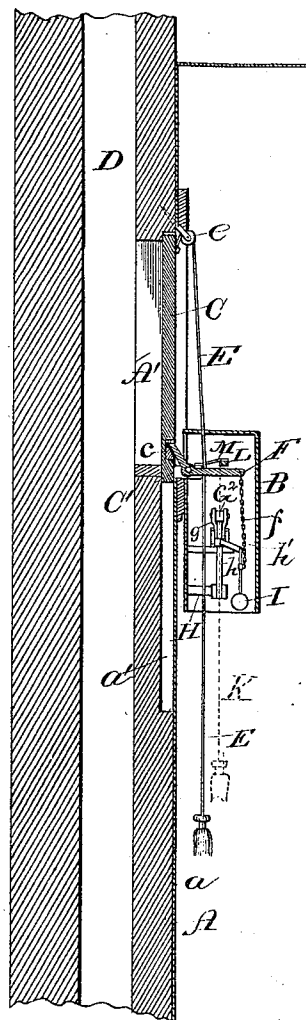
No. 282,822.

Patented Aug. 7, 1883.

*Fig. 1.*



*Fig. 2.*



Witnesses:

*E. Idemus*

*M. Kaumheimer*

Inventor:

*Charles A. Willard*

*By*

*Stout & Underwood*  
*Attorneys*

# UNITED STATES PATENT OFFICE.

CHARLES A. WILLARD, OF WEST DE PERE, WISCONSIN.

## SMOKE AND FLAME OUTLET FOR BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 282,822, dated August 7, 1883.

Application filed March 22, 1883. (No model.)

### *To all whom it may concern:*

Be it known that I, CHARLES A. WILLARD, of West De Pere, in the county of Brown, and in the State of Wisconsin, have invented certain new and useful Improvements in Smoke and Flame Outlets in Buildings; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to hollow walls or passages in buildings leading either out of the building above the roof or else into an elevator-shaft, and designed to serve as outlets for smoke and flames when the said building takes fire, being designed as an improvement on the device patented to Samuel W. Willard on the 18th day of July, 1882, and numbered 261,286; and it consists in certain details of construction, as will be more fully set forth hereinafter.

In the drawings, Figure 1 is an elevation of my device applied to an inclined flue in the walls, and Fig. 2 a sectional view, showing the device applied to a vertical flue.

A represents the inner wall of a building—that is, the wall of the room in which my device is located—the operative parts of said device being covered by a box, B, either plain or ornamental, and located against the wall of the room. A thin lining, *a*, which may be lath and plaster, covers the wall A and conceals the space *a'* down into which the door C drops when the catch is released, in order to open the passage A' that leads into the flue D.

I have shown my device adapted for either automatic action by means of an electro-magnet connecting with a thermostat, as well as for operation by hand, by pulling upon a cord, or by manipulating keys connected to the wires of a battery; and any of these means may be employed, though I prefer to equip my device with all. E is a cord passing around a pulley, *e*, suspended above the door, and this cord is attached to the door, near its top, so that by pulling on the cord after the door has been dropped it can be again raised to place to close the opening A'; and *c* is a catch or depression in the front of the door, near its bottom, to receive one end of the bell-crank F, which is journaled in the sill C' of the said door-opening A'.

G is a frame bearing an electro-magnet, G',

and an upright standard, *g*, in which is pivoted an armature, G<sup>2</sup>, the outer end of the short arm of which, farthest from the magnet, is provided with a catch to receive the end of a trigger, *h*, pivoted on a projecting bracket, H. This trigger carries an arm, *h'*, connected thereto by collar and thumb-screw, from which arm a weight, I, is suspended, and is also connected to the end of the long arm of the bell-crank F by a slack chain or cord, *f*, so that when the armature G<sup>2</sup> releases the trigger *h* the latter will fall from an almost vertical toward a horizontal position, and the weight I, drawing upon the chain or cord *f*, will pull the short arm of the bell-crank F from under the catch *c* in the door C and permit the said door to drop, by its own weight, into the space *a'*, and thus open the passage A' between the room and the flue and enable the smoke, &c., in the former to be instantly drawn out into the latter.

The magnet G' is connected by wires to a battery located at any convenient point, and the wires may, as stated, run to keys properly located, so that at any time a current may be established by manipulating one of the keys, or by the mercurial bulb of a thermostat, and this current will cause the coils of the magnet to draw the long arm of the armature down to raise its short arm out of engagement with the trigger, and thus allow the weight I to free the short arm of the bell-crank F from the door C and permit the latter to drop, as already described. When, however, it is required to open the passage A' and drop the door C by hand in the room containing the device, it is only necessary to pull upon the cord K, which is secured to a lever, L, pivoted in a projection attached to the sill C'. The short arm of this lever carries a weight, *l*, to counterbalance the weight of the cord and tassel, and its long arm (to which said cord is attached) projects over the long arm of the bell-crank F transversely thereto, so that a pull on the cord K will instantly cause the lever L to depress the said long arm of the bell-crank and free its short arm from engagement with the catch *c*, and the door C will drop, as before, and without disturbing the armature and trigger and their connections. A stop, M, projecting at an angle from the sill C over the top of the long arm of the lever L, prevents the

latter from being raised too high by the weight *l* on its short arm. If desired, springs may be attached to the sill *C'* or the box *B* to aid in keeping the bell-crank *F* tight against the door until released.

By means of my device, which may be in every room of a house or hotel, should fire occur in a room the heat arising from the fire will raise the mercury in a thermostat placed in the ceiling of the room and connected with the magnet, the effect of which will be to draw down the armature and drop the weight *I*, releasing the bell-crank from the catch *c*, permitting the door *C* to drop in the wall, as heretofore described. Thus a free draft of air will be created from this room into the flue *D*, carrying with it the smoke and heat, which are the great obstacles to be contended with in controlling accidental fires.

In the patent of Samuel W. Willard, already named, on which the present invention is an improvement, the device was only shown adapted for use in connection with an elevator or other vertical shaft directly next the room or apartment wherein the said device was located; but in the construction of buildings it has often been found impossible to supply these vertical shafts at all points where it was desired to locate the device, and hence I have substituted my flues or passages *D* for said shafts, the said passages being designed to lead to the elevator-shaft or other suitable outlet; and again, the trap-doors would sometimes work inconveniently, owing to the restricted space allotted in certain instances, and hence I have devised my sliding doors, operated by catches and cords, and having depressions to receive said catches, whereby the doors may slide freely their entire length in the narrow recesses prepared to receive them, as described, the same being a valuable improvement on the patented device already named.

As stated, I equip my device with electrical means for causing the door to drop, as well as direct means, consisting of cord and weighted lever, and this is for this reason: The cord and lever are within the reach of the occupants of each room, and should the fire there break out the door could be instantly released from the catch and permitted to drop by pulling on the cord *K*, whereas as the battery is designed

to be located at some convenient central point—such as the clerk's office in a hotel, &c.—and provided with wires connecting with the armatures in all the rooms, the object of this attachment is to instantly open all the passages ways for smoke, &c., in all the rooms from such central point, and thereby save life when, as at night, the occupants of the rooms may be asleep, and unaware of the danger they were in.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the wall of a building having a flue or passage formed therein communicating with an opening in the roof or other outlet, a sliding door in said wall covering an opening leading into said flue, and having a depression near the bottom of said door to receive one end of a bell-crank pivoted to the sill of the door-opening to keep the door closed, and means for releasing said bell-crank to enable said door to drop, and a cord for again raising the door to close the opening, substantially as described.

2. In combination with the wall *A*, having flue *D*, leading to the outlet of a building, the sliding door *C*, with cord *E*, secured at the top, and depression *c* near the bottom, bell-crank *F*, pivoted in the sill of the door-opening, and means, substantially as described, for releasing the bell-crank and permitting the door to drop, substantially as set forth.

3. In combination with the wall *A*, having flue *D*, leading to an outlet of a building, the sliding door *C*, provided with a depression, *c*, bell-crank *F*, frame *G*, with magnet *G'*, having wires connected to a battery, and pivoted armature *G''*, bracket *H*, with trigger *h*, bearing arm *h'*, and weight *I*, and slack chain or cord *f*, connected to the long arm of the bell-crank, whereby when the circuit is closed the trigger will be released and the door allowed to drop, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, on this 13th day of February, 1883, in the presence of two witnesses.

CHAS. A. WILLARD.

Witnesses:

STANLEY S. STOUT,  
ADOLPH E. KLINE.