Oct. 30, 1934. O. A. ELLIS 1,978,743

DOOR AND WINDOW OPENING TOOL

Filed June 12, 1933

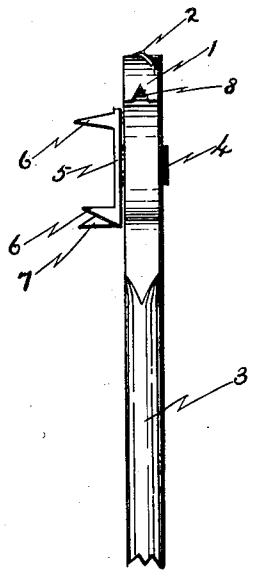


FIG. 1

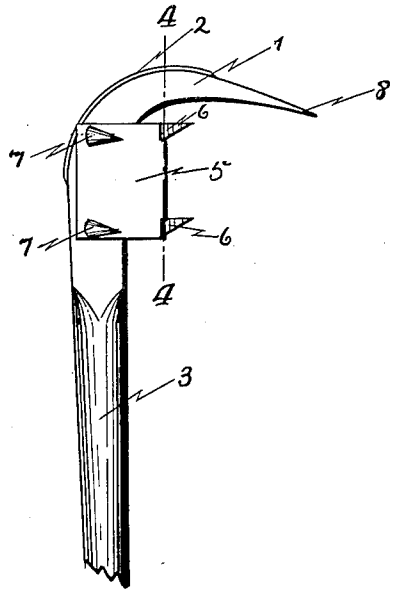


FIG. 2

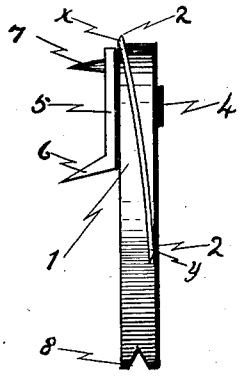


FIG. 3

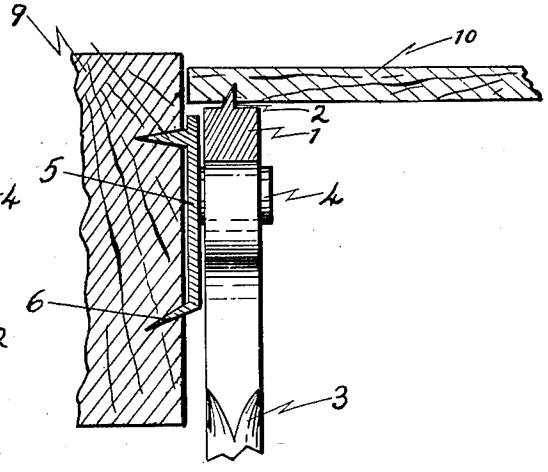


FIG. 4

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UNITED STATES PATENT OFFICE

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DOOR AND WINDOW OPENING TOOL

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5 Claims. (Cl. 254—104)

The invention relates to improvements in door and window openers, such as now used by city and State fire departments, in which a cam is actuated by means of a hand lever.

The object of the improvements is, first, to provide a simple means of holding a cam in position against a door or window sill, and second, to provide a means whereby the action of the cam will compel its holding means to firmly engage a door or a window frame and at the same time force the door or window open when the tool is applied to either. In the case of a door to be opened, the holding means would engage the part of the frame known as the jamb. I realize that there are other door openers having a holding means which engages the door jamb. They, however, rely upon taking hold of a part of the jamb known as the door stop. After the stop has been torn off, the tool becomes inoperative, so that another object of my invention is to provide a holding means that will engage a jamb lacking a stop or in the event where the stop has been torn off from the jamb.

One form of the invention is illustrated in the accompanying drawing in which Fig. 1 is a front view and Fig. 2 is a side view, both showing cam and holding means, also part of the lever; Fig. 3, a view of the face of the cam with a spirally mounted blade; Fig. 4, a sectional view on line 4—4 of Fig. 2 showing the cam held in position against a door, and lateral teeth on the plate forced into the woodwork of a door jamb; also the spiral runner blade on the face of the cam engaging the door.

The cam 1 is actuated by lever 3. 3 is mounted upon pivot 4. 4 is integrally mounted on plate 5. 5 is provided with lateral teeth 6 and 7 on the opposite face. Said teeth are forced into and engage a door frame when the cam is rotated. 8 is a claw which may be used for various purposes, 9 shows the section of a door frame, and 10 the section of a door.

The feature of this invention is clearly shown in Fig. 3 and Fig. 4, where a spiral blade is shown upon the face of a cam 1, and how the spiral blade engages in a door. It will be readily understood that when point X on the spiral blade engages in a door and rotates to point Y (see Fig. 3) the blade will form a track in the door, and the blade following in its self-made track will force the entire cam 1 against the plate 5. Thus pressure is brought to bear upon the plate and will force lateral teeth 6 and 7 on the opposite side of the plate into the door frame 9, thereby providing a sufficient means of holding the cam in position, and as this sideways motion is in process, it will be noted that the face of the cam 1 bears against the door and the distance between the pivot pin 4 is gradually increased as the cam rotates forcing the door open, thus two operations being performed at the same time; namely, the holding means, consisting of a plate, a pivot pin and lateral teeth, is forced to take hold of the door frame while the door is being forced open by the action of the cam. Because of the sideways action of the blade, and the forward action of the cam, and the blade being an integral portion of the cam, we will refer to this combination of a blade and a cam as a "dual-action cam".

I am aware that, prior to my invention, door openers having a cam, a lever attached, and provided with a means of holding same in position, have been made. I, therefore, do not claim such a combination broadly.

I claim:

1. The combination in a door opener, a lever, a dual-action cam portion formed integral therewith and adapted for abutment against a door to be opened, a holding means comprising a plate, teeth extending from one face thereof, a pivot pin extending from the opposite face thereof, said cam mounted upon said pivot pin, the aforesaid teeth being adapted to engage a door frame regardless of the presence of a door stop.

2. The combination in a door opener having a lever, a dual-action cam portion formed integral therewith, said cam portion having a face adapted for abutment against a door to be opened, a spiral blade integrally mounted upon said face to engage the door and impart a sideways motion to the entire door opener, a holding means comprising a plate, teeth extending from one face thereof, said teeth positioned to engage the door frame and eliminate stress upon the door stop, the aforesaid cam pivotally connected to said holding means.

3. A combination in a door opener as described, comprising a cam having a face, adapted for abutment against a door to be opened, a holding means to engage the door frame, said cam pivotally mounted upon said holding means, a spiral blade integrally mounted upon the face of the cam to engage the door and act in conjunction therewith and transversely thereto, to press the holding means into position compelling its engagement with the door frame.

4. The combination in a door opener, a holding means consisting of a plate, teeth extending from one face thereof to engage a door frame, a

pivot pin extending from the opposite face, a cam having a face adapted for abutment against a door to be opened, said cam mounted upon said pivot pin, a spiral blade integrally mounted upon the face of said cam and adapted to engage the door, said blade acting in conjunction with said cam to impart a transverse motion to the door in opposition to the aforesaid holding means.

5. The combination in a door opener, a holding means to engage a door frame, a cam having a face adapted for abutment against a door to force the door inward, a spiral blade on the face of said cam to engage the door, the action of said cam and said blade in conjunction with the aforesaid holding means to impart a pressure diagonal between the door and the door frame.

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