(No Model.)

E. W. DAILY.

DOOR CLOSER.

No. 483,140. Patented Sept. 27, 1892.

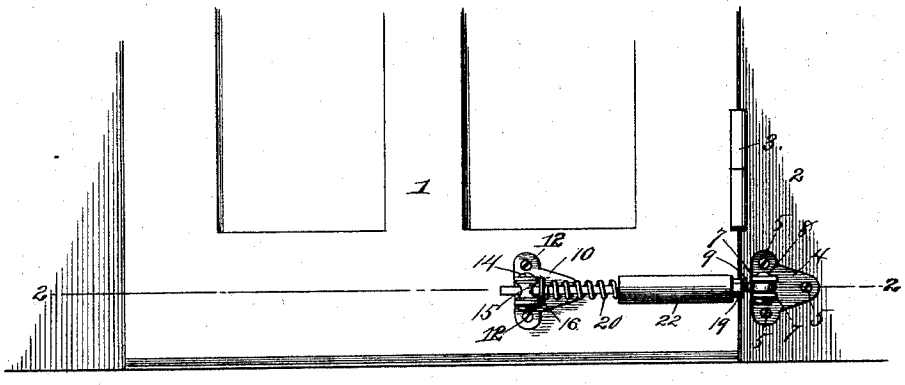


Fig. 1.

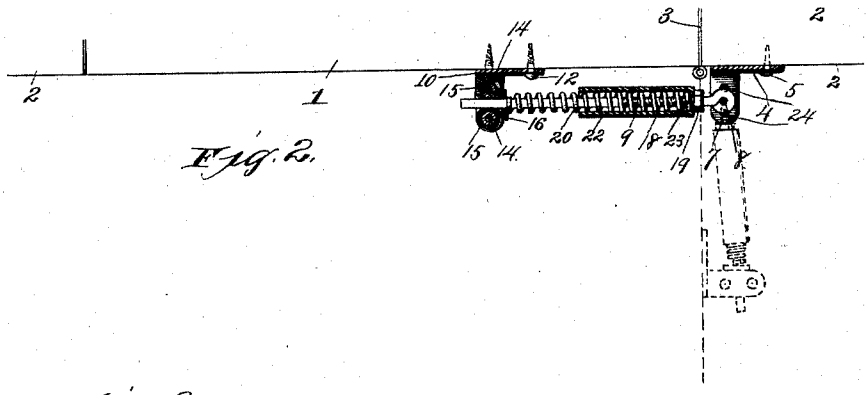
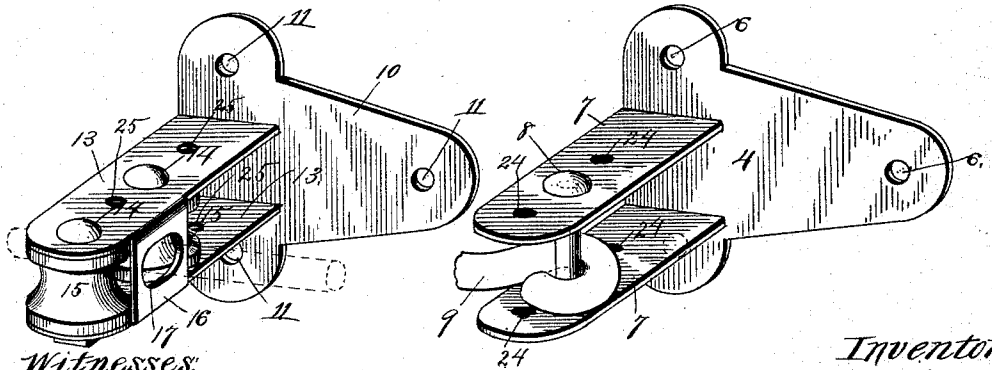


Fig. 2.

Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ETHAN W. DAILY, OF KANSAS CITY, KANSAS.

DOOR-CLOSER.

SPECIFICATION forming part of Letters Patent No. 483,140, dated September 27, 1892.

Application filed January 11, 1892. Serial No. 417,723. (No model.)

To all whom it may concern:

Be it known that I, ETHAN W. DAILY, of Kansas City, Wyandotte county, Kansas, have invented certain new and useful Improvements in Door-Closers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to devices for automatically closing the doors of houses, apartments, and similar structures; and the object of my invention is to produce a door-closer which shall be simple, strong, durable, and comparatively inexpensive in construction and the operating-spring of which shall be effectively protected against injury by contact with external objects.

A further object of my invention is to produce a door-closer which shall also be capable of ready application to and removal from doors and similar structures of a great variety of types.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the lower part of a door and its frame or casing with my improved door-closer applied thereto. Fig. 2 is a horizontal section of the same on the line 2 2 of Fig. 1. Fig. 3 is a detached perspective view, on an enlarged scale, of the guide-bracket of the device and certain of its operative connections. Fig. 4 is a similar view of the pivot-bracket of the device, showing the main rod of the device connected to said bracket.

In the said drawings, 1 designates a door, which may be of the usual or any preferred type and which may be either an outside door of a building or an inner door of one of the apartments of such building or a door in any other usual or preferred situation.

2 designates the frame or casing of the door 1, and 3 one of the hinges by which the door is connected to its casing.

4 designates a bracket-plate, which is preferably of approximately triangular form, as shown, but which may be of any other suitable or preferred shape, and which is shown as provided at its apex and at its two remaining angles with holes 6, through which are inserted screws 5 or equivalent devices for securing the bracket-plate in position upon the casing 2. This bracket-plate is shown as secured to that part of the casing to which the hinges 3 are connected. The said bracket-plate is preferably attached to the lower part of the casing 2, and upon its outer side, near its larger end, the bracket-plate 4 is formed or otherwise provided with two parallel horizontal arms 7, which extend outwardly at right angles from the plate, the outer ends of said arms being preferably rounded off, as shown. Through the outer ends of the two bracket-arms 7 extends a vertical pivot-bolt or pintle 8, which is embraced loosely by one end of the main rod 9 of the device, the said end of the rod being either bent around the bolt or pintle 8, as shown, or otherwise formed to loosely surround the bolt or pintle 8.

10 designates the guide bracket-plate, said plate being preferably of similar form to the plate 4 and provided at its apex and its two remaining angles with holes 11, through which are inserted screws 12 or equivalent devices, which secure the plate upon the door. This bracket-plate is shown as secured to that side of the door toward which the door moves while being opened, and also as placed directly opposite the bracket-plate 4 in a horizontal line therefrom.

Upon the outer side of the bracket-plate 10, at its larger end, are formed or otherwise secured two parallel bracket-arms 13, which extend horizontally outward at right angles from the plate 10, the outer ends of said arms being also preferably rounded off. Through the outer ends of these two bracket-arms extend two vertical parallel bolts or rivets 14, each of which is surrounded by a roller 15. Each of these rollers 15 is of such length as to fit easily between the two bracket-arms 13, and each is arranged to turn freely upon its bolt or rivet 14, the peripheries of said rollers being grooved, as shown. The main rod 9 of the device is of such length as to extend at its outer or free end between the rollers at all times whether the door is opened or closed.

16 designates a bearing-plate, which is shown as formed integrally with the outer part of the arms 13 at that side of the same which is toward the bracket-plate 4. This bearing-plate is preferably of the rectangular form shown and is formed centrally with a horizontally-elongated opening or slot 17, the center of which is in exact alignment with the middle of the space between the two rollers 15, and the main rod 9 of the device extends through said openings, as shown. The main rod 9 is externally screw-threaded, as shown at 18, said screw-threaded portion beginning near that end of the rod which surrounds the bolt or pintle 8 and extending toward or entirely to the opposite end of the rod. Upon this screw-threaded portion 18 is placed an adjustable bearing-nut 19, which surrounds the rod 9, as shown. The said rod 9 is also surrounded by a spiral spring 20, which is of such length as to abut at one end against the outer side of the bearing-plate 16 and at its opposite end against the outer end of a sleeve 21 at all times, whether the door 1 is opened or closed. In order to protect the spring 20 from injury by contact with external objects, the said spring and the rod 9 are surrounded partially by a sleeve 22, as shown. The outer end of this sleeve, or, in other words, that end which is adjacent to the bracket-plate 4, is formed with an internal flange 23, preferably of circular form, and the corresponding end of the spring 20 abuts against said flange, and consequently forces the outer end of the sleeve against the adjustable nut 19. The length of the sleeve 22 is such as to permit the door to be fully opened before the bearing-plate 16 comes into contact with the adjacent end of the sleeve, and it is to be observed that by turning the nut 19 in one or the opposite direction the sleeve 22 can be set so as to permit the door to be opened fully or partially, as desired.

It will be seen from the above description that when the door is opened the bearing-plate 16 will compress the spring 20, as shown in dotted lines in Fig. 2, and that when the door is released the expansive action of the spring 20, acting against the bearing-plate 16, will automatically close the door.

It will be understood that the pin 8, which is surrounded by the outer end of the main rod 9, is to be set into one or another pair of a number of oppositely-disposed holes 24, which are formed through the bracket-arms 7 of the bracket-plate 4, the arrangement thus being such that greater or less leverage is given to the rod 9, as desired. It is to be further understood that a similar number of oppositely-disposed pairs of holes 25 is formed in the bracket-arms 13 of the bracket-plate 10 and that the pins 14 can each be set in one or another of said pairs of holes, thus also increasing or decreasing the leverage of the rod 9, as desired. Finally, it is to be observed that, if desired, the pins 14 may be set loosely in the holes 25, so as to revolve axially therein, thus permitting the rollers 15 to either be used or dispensed with, as preferred.

From the above description it will be seen that I have produced a door-closer which is simple, strong, durable, and inexpensive in construction, which operates automatically to close the door, the spring of which is effectively protected against injury by contact with external objects, and which can be readily attached to and removed from doors of various types and in various situations.

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

A door-closer comprising a bracket having a pair of outwardly-extending parallel arms provided with a number of oppositely-disposed openings, a second bracket also provided with a pair of outwardly-extending parallel arms which are also provided with a number of oppositely-disposed openings, a pin or pintle inserted removably through one pair of openings of the first bracket-arms, an operating-rod loosely surrounding said pin and externally screw-threaded near such point of connection with the pin, a pair of pins inserted through two pairs of openings in the arms of the second bracket, peripherally-grooved rollers surrounding said pins, the free end of the operating-rod extending between said rollers, a nut screwed adjustably upon the threaded end of the operating-rod, a cylindrical casing surrounding said part of the rod and having an internal end flange abutting against the nut, a spiral spring surrounding the rod and inclosed within the casing and also abutting against the end flange thereof, and a bearing-plate having a horizontal slot to receive the free end of the rod and formed upon one side of the bracket-arms of the second bracket and also serving to receive the thrust of the spring, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

ETHAN W. DAILY.

Witnesses:
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