

No. 889,365.

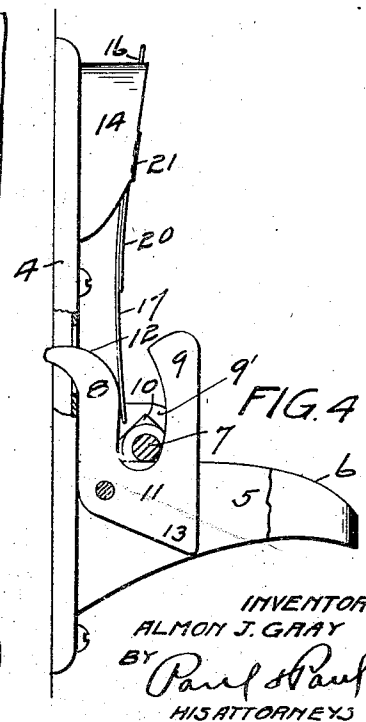
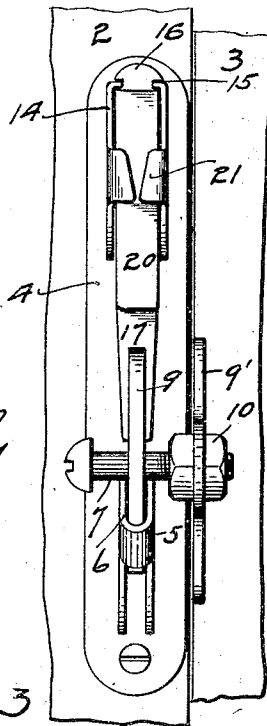
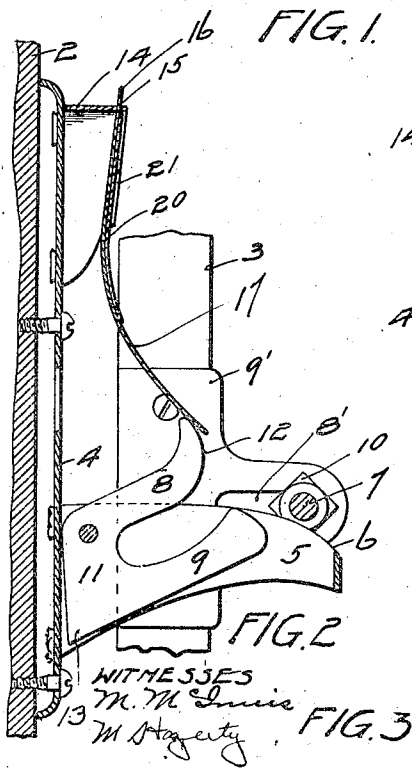
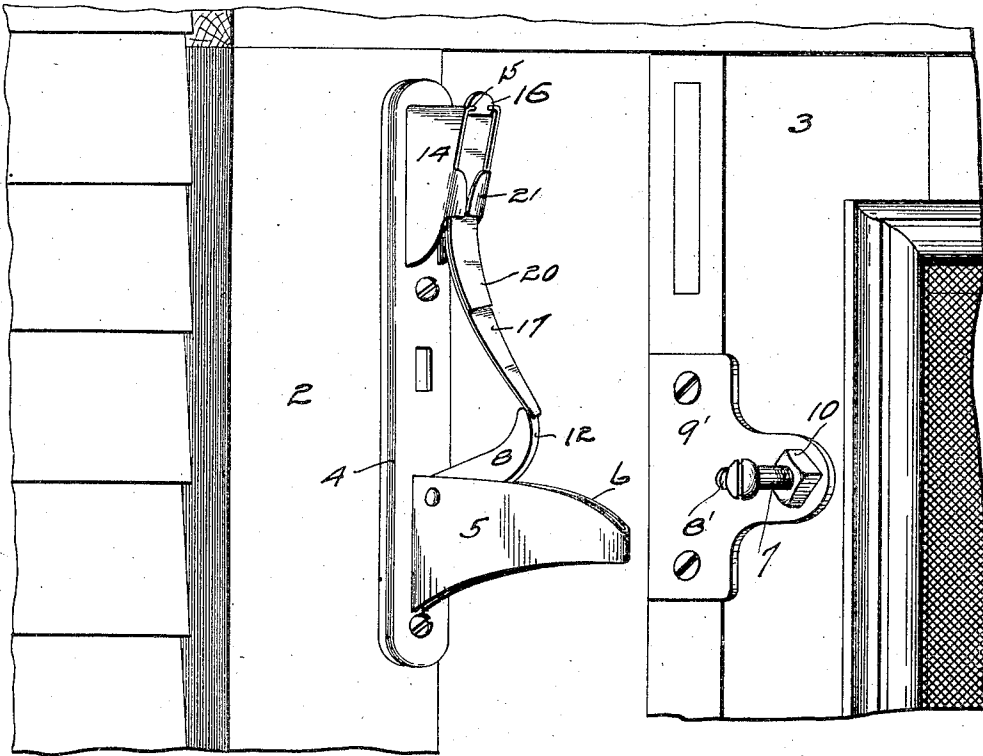
PATENTED JUNE 2, 1908.

A. J. GRAY.

DOOR OR GATE SUPPORT AND CLOSER.

APPLICATION FILED JULY 22, 1904.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

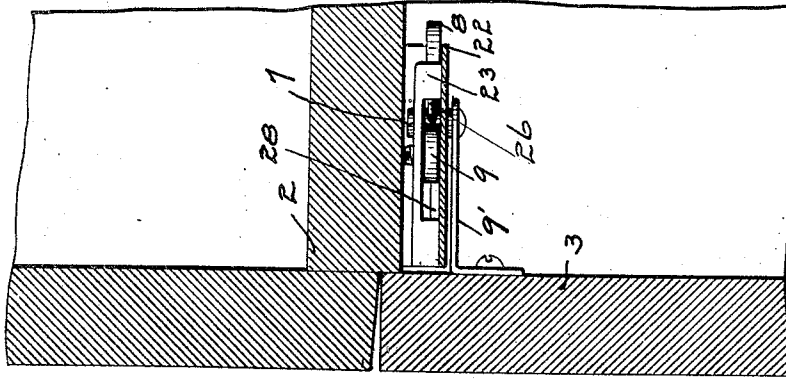


FIG. 8
z-y.

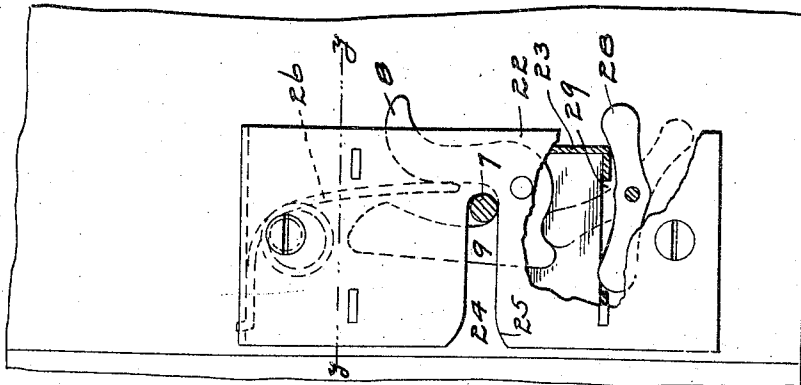


FIG. 6.

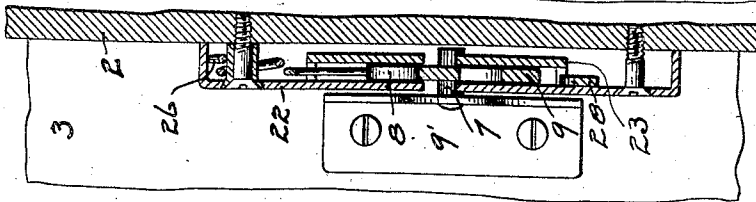


FIG. 7
x-x

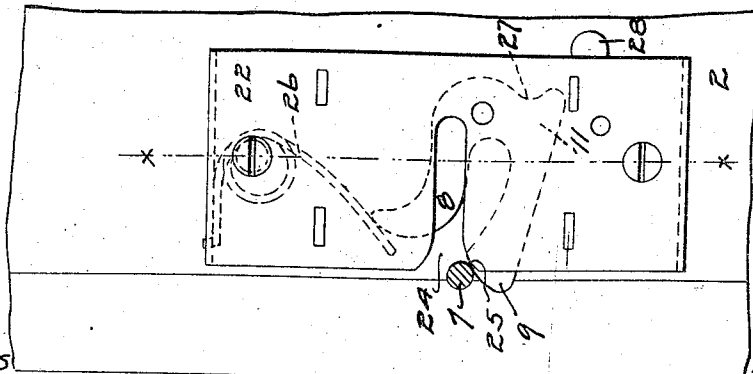


FIG. 5.

WITNESSES
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UNITED STATES PATENT OFFICE.

ALMON J. GRAY, OF ST. PAUL, MINNESOTA.

DOOR OR GATE SUPPORT AND CLOSER.

No. 889,365.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed July 22, 1904. Serial No. 217,729.

To all whom it may concern:

Be it known that I, ALMON J. GRAY, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Door or Gate Supports and Closers, of which the following is a specification.

My invention relates to supports and closers for doors or gates and is particularly adapted for use on screen doors.

The object of the invention is to provide means applicable to any door or gate but designed particularly for screen doors for supporting them at the side opposite the hinges to relieve them as much as possible of the weight of the door, to raise the door to its proper place when being closed and keep it from sagging and dragging on the sill; to prevent the door from warping, and to tightly close the door if warped before the application of the fastener thereto; to close and always hold the door closed when it would otherwise rebound and stand slightly open; and a further object is to provide a closer which is entirely automatic in its action, thus making it possible to place the closer at any point along the side of the door opposite the hinges where it will be most effective in holding the door tightly closed.

The invention consists generally in a pivoted spring actuated latch having a socket and a pin or stud adapted to enter said socket and trip said latch and be held thereby in a closed position and be released automatically when pressure is applied to open the door.

Further the invention consists in providing a rounded or crowning surface on which the pin rides in closing the door to lift it away from the sill and prevent dragging thereon and relieve the weight on the hinges.

Further the invention consists in providing means in connection with the latch for locking it and the door in its closed position.

Further the invention consists in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective view of a portion of a door casing and screen door with my invention applied thereto. Fig. 2 is a detail sectional view showing the manner of mounting the device on the door casing, and the door partially closed. Fig. 3 is a front view showing the device and the door in their closed position.

Fig. 4 is a side view of the same. Fig. 5 is a detail sectional view of a modified form of the device applied to a door jamb, the device being in a partially closed position. Fig. 6 is a similar view showing the device and the door in their closed position. Fig. 7 is a sectional view on the line $x-x$ of Fig. 5. Fig. 8 is a horizontal sectional view on the line $y-y$ of Fig. 6.

Referring to Sheet 1, Figs. 1, 2, 3 and 4, 2 represents a door casing and 3 a screen door, here shown as ajar. Doors of this type are usually of light construction frame work and are closed and held in such position by a spring mechanism operating on the door at the side contiguous to the hinges where, for obvious reasons, the force exerted to hold the door tightly closed, or to close it at all, is inadequate and it frequently happens that the door will become warped or will sag through wear of the hinges or loosening of the joints, and will strike the sill at the bottom of the casing or the front side, and the ordinary springs used will fail to close the door tightly or allow it to rebound and stand partially open, leaving a space through which insects may enter. The door may also be blown open by drafts of air. To avoid this difficulty and objection to the ordinary screen door, I provide a device to support the door at its front side and bring it up to its proper position out of contact with the front casing or the sill. My invention also draws the door in at the side opposite the hinges so it will fit snugly against the casing and will allow it to be opened without manipulation.

The device consists of a base 4 secured to the door casing (see Fig. 1) at a point where it will be most effective in holding the door in its closed position. Near the lower end of the base I provide a bracket 5 having a curved surface 6 at its outer end and adapted to receive and support a pin 7 adjustably mounted in a slot 8' in a plate 9' that is secured to the edge of the door. Lock-nuts 10 on the said pin 7 render it easily adjustable back and forth in said slot to change the position of the pin, according to the thickness of the door, and the position of the closing device on the casing.

A forked latch 11 is pivoted in the bracket 5 near the base 4. This latch is provided with two arms 8 and 9 between which a recess is formed extending to a point near the pivot of the latch and this recess is adapted to receive the stud 7. The inner edge of the

arm 8 has a convex or curved surface 12 against which the pin 7 strikes in closing the door. The latch 11 is provided with a heel or projection 13 that engages the base 4 and limits the outward movement of said latch. Mounted upon the base 4 near the upper end thereof, is a box or casing 14 having a slot 15 to receive the notched end 16 of a flat spring 17 whose lower end is adapted to enter the recess between the arms 8 and 9 and bearing upon the curved surface 12 of the arm 8, hold the latch stationary in its outward position and assumes the position shown in Fig. 4 to hold the latch in its closed position.

The curved surface 12, with which the spring comes in contact, allows the arm 8 to be made longer and permits the latch to be tilted outward to nearly a horizontal position with the least deflection of the spring 17 when the door is open and also brings the arm 8 nearer the upper edge of the support and insures the contact of the latch with the door pin at a point nearer the outer end of the support and consequently an earlier tripping of the latch when the door is closed. This construction also allows the spring 17 to be made short enough so that it will not interfere with the door pin when the latch is operated. It also tends to equalize the force the springs exert to close the door and hold it closed.

When the latch is in its closed position, as shown in Fig. 4, the spring under its least tension will bear thereon near the pivot of the latch. When, however, the latch is tilted forward the spring will slide over the curved surface 12 and be gradually put under tension until it assumes the position shown in Fig. 2, bearing on the outer end of the arm 8. The force of the spring will be taken up largely in this position by the pivot of the latch and the parts will remain stationary until the pin 7 strikes the arm 8 in closing the door. The latch will then be tilted inward and the spring will slide down the curved surface of the arm 8 to the position shown in Fig. 4, where it will hold the latch and door against outward movement.

In the open or forward position of the latch the inner edge of the arm 9 is level substantially with the upper edge 6 of the bracket 5. In closing the door the pin 7 will ride on the edge 6 and passing over the arm 9 will enter the recess between it and the arm 8 and striking the latter will release the spring which will press the latch backward to its closed position. As the latch swings inward, the arm 9 rises on the outer side of the pivot 7 and presses it back into the recess and as the pin approaches the latch pivot the leverage of the arm 9 thereon increases and the power exerted by the spring is also greater to press and hold the pin back and the door tightly closed.

The spring 17 may be stiffened by one or more short sections 20 arranged in the box 14

under the flanges 21. These springs may be readily removed to allow the substitution of others, or they may be turned over and subjected to a strain in the opposite direction.

The curved edge 6 extends outwardly to a point below the normal level of the pin on the door and will engage it when the door is being closed and lift the door to the proper level to clear the sill and casing. If the door has become loose in the joints or in the hinges, or has sagged, the pin striking the curved surface 6 will ride thereon and lift the door to its proper level.

In Figs. 5, 6, 7 and 8, I have shown a slightly modified construction, adapted for use on the jamb of a door instead of on the casing. In this construction a flanged plate 22 is secured to the door jamb by any suitable means and covers a similar plate 23, also flanged, which with the outer plate forms a box or casing wherein the operating mechanism is arranged. The flanges on the plate 22 are preferably of greater depth than on the other plate, to provide sufficient space between the plate 23 and the door jamb for the free movement of the latch operating pin. The plates 22 and 23 are provided with slots 24 arranged to coincide with one another, and having curved outer edges 25, which will engage the latch operating pin and raise it and the door slightly as the pin enters the slot. By providing the plates with curved edges on both sides of the slots I am able to use the support and closer with either end up to adapt it for doors opening either to the right or the left. The upper edges of the slots act as guides for the latch operating pin as it is moved back and forth in the slots. To reduce the length of the device and make it more compact in form, I prefer to provide a coil spring 26 engaging one arm of the latch and having the same function as the flat spring shown in Sheet 1. To lock the latch in its closed position I provide a notch or recess 27 in the lower end thereof, adapted to receive one end of a centrally pivoted finger-piece 28 mounted on the base plate 22 and operating through slots 29 in the end of the plate 23. The locked and unlocked position of this finger-piece is shown in Fig. 6. In other respects the latch corresponds to the one shown in Sheet 1, the arm 8 being engaged by the spring 26 and the opposite arm 9 extending downwardly below the slots 24 and adapted to follow the pin as it enters therein. The upper edges of the slots in the plates shown on Sheet 2 act as guides for the pin and hold it in place on the support and insure the tilting of the latch to the limit of its outward position when the door is opened. The guide will also overcome the tendency of light doors to rise up from the support and fail to tilt the latch when the door is opened quickly, especially when the closer is placed on the upper part of the casing. If the latch

is not tilted to the limit of its forward movement it is liable to fly back after the pin passes out and prevent the operation of the device when the door is closed.

6 I claim as my invention:

1. The combination, with a door frame, of a bracket secured thereon and having a curved edge, a pin provided on the door and adapted to engage said edge and be elevated 10 with the door thereby, and a spring actuated latch mounted on said bracket and over which latch said pin passes to engage and hold said pin.

2. A pivoted spring actuated latch having 15 a suitable socket, a pin adapted to trip said latch and enter said socket and be held therein by the tension of said spring when the door is closed and released automatically when force is applied to open the door, and 20 means for locking said latch in its closed position.

3. A door or gate support and closer, comprising a pivoted spring actuated latch having arms with a socket or space between 25 them and a notch or recess, a pin adapted to trip said latch and enter the space between said arms and be held therein when the door is closed and released automatically when force is applied to open the door, and a 30 pivoted catch arranged to enter said notch and lock said latch in its closed position.

4. A door closer comprising a base 4 adapted to be secured on the door casing, a downwardly projecting bracket 5 mounted 35 on said base and having a vertical recess and a downwardly curved upper edge at its outer end, a latch pivoted within the recess in said bracket and having arms 8 and 9 with a recess between them, the arm 8 being upwardly 40 curved and normally projecting above the upper edge of said bracket, and the arm 9

having its outer end normally flush with said edge, a flat spring mounted in the upper part of said base and having its lower end adapted to bear on the curved end of said arm 8 and 45 slide thereon when said latch is oscillated and a pin mounted on the door and arranged to ride on the upper edge of said bracket when the door is closed and engage said arm 8 and tilt said latch to a vertical position and enter 50 the recess between said arms 8 and 9 and be yieldingly held therein by the tension of said spring engaging said arm 8, substantially as described.

5. A door closer comprising a base adapted 55 to be secured to the door frame and having a vertical recess and a downwardly curved edge, a latch pivoted within said recess and having arms with a recess between them, one of said arms being upwardly curved and 60 normally projecting above said curved edge, and the other arm having its outer end normally flush with said edge, a spring mounted in the upper part of said base and having its lower end adapted to bear on the curved end 65 of said first named arm and slide thereon when said latch is oscillated, and a pin mounted on the door and arranged to ride on said curved edge when the door is closed and engage said first named arm and tilt said 70 latch to a vertical position and enter the recess between said arms and be yieldingly held therein by the tension of said spring engaging one of said arms, substantially as described. 75

In witness whereof, I have hereunto set my hand this 18th day of July 1904.

ALMON J. GRAY.

In presence of:—

RICHARD PAUL,
M. HAGERTY.