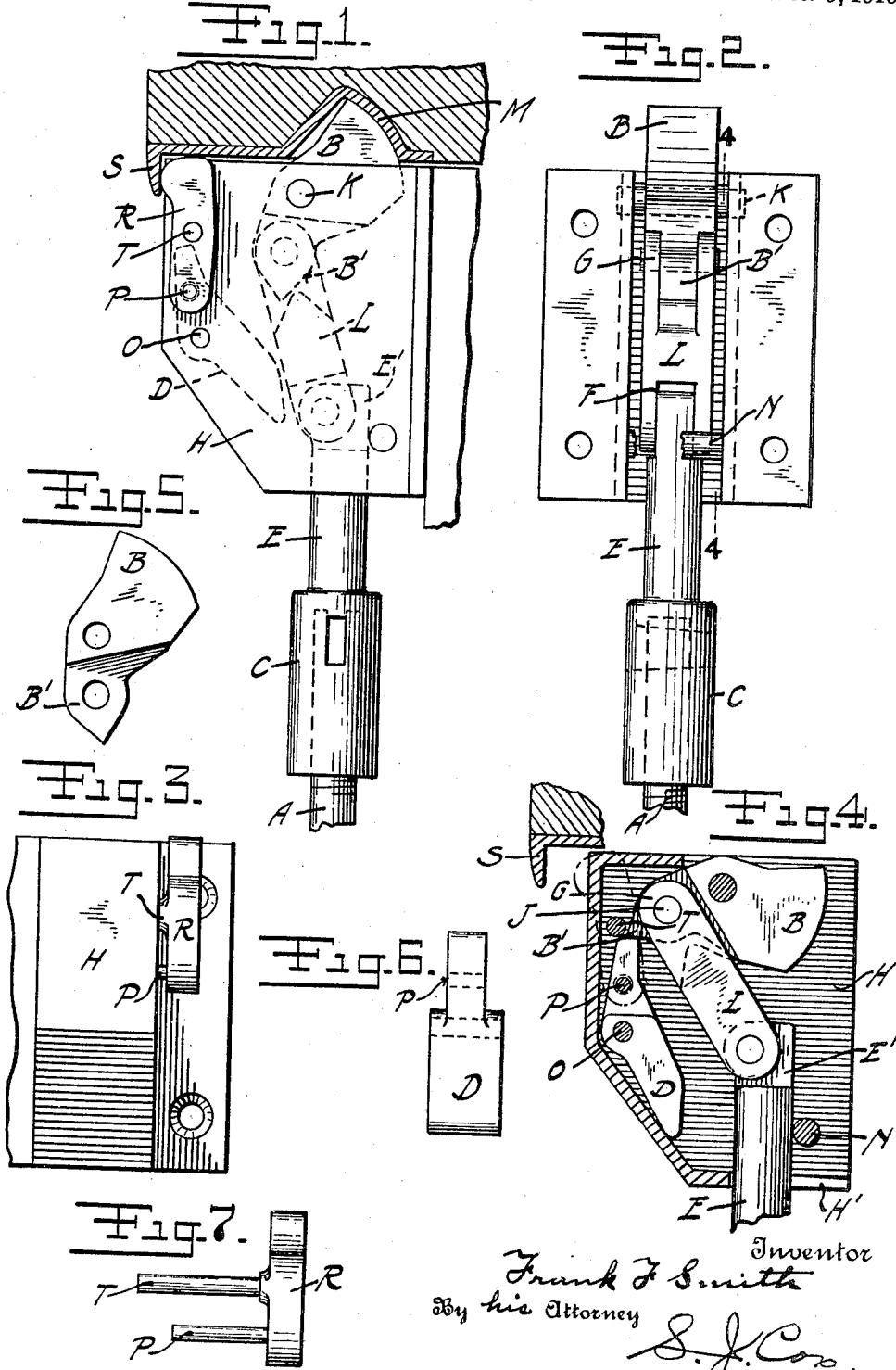


F. F. SMITH.
DOOR LOCK MECHANISM.
APPLICATION FILED MAR. 11, 1918.

1,324,181.

Patented Dec. 9, 1919.



Inventor
Frank F. Smith
By his Attorney
S. J. Cox.

UNITED STATES PATENT OFFICE.

FRANK F. SMITH, OF NEWARK, NEW JERSEY, ASSIGNOR TO FRANK F. SMITH HARDWARE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DOOR-LOCK MECHANISM.

1,324,181.

Specification of Letters Patent.

Patented Dec. 9, 1919.

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To all whom it may concern:

Be it known that I, FRANK F. SMITH, a citizen of the United States, and a resident of the city of Newark, in the county of Essex, State of New Jersey, have invented certain new and useful improvements in Door-Lock Mechanism, of which the following is a specification.

The improvements relate to locking devices of the emergency exit or "panic" lock variety and have for their objects, among others, the provision of simple and effective means for automatically dogging or blocking the bolt which engages the socket-plate, and holds the bar, and any other bolts—if other bolts are connected therewith—in unlocked position while the door is open. This provision is very desirable where there is a flush sill or a carpeted floor, as by holding the bolts in retracted position when the door is swinging injury to the sill, floor or floor covering is avoided, as well as injury to the bolts themselves.

The improvements are illustrated in the accompanying drawings, in which Figure 1 is an elevation of an automatic dogging device with the adjacent socket plate in vertical section; Fig. 2 is an inside edge view of the same removed from the face of the door; Fig. 3 is a view from the edge or side opposite that of Fig. 2; Fig. 4 is a vertical section of the housing substantially on the line 4—4 of Fig. 2, with the parts contained in said housing shown in elevation, and in a different position from that of Figs. 1 and 2; Fig. 5 is a detail of the bolt in side elevation; Fig. 6 is an edge view of the bolt detached; Fig. 7 is a detail of the tripping lever for releasing the dogging device with the pins for which it is mounted in the housing and connected with the adjacent cooperating member.

The rod A, in the illustration of the invention shown in the drawings, is mounted to move up and down, and to retract the bolt or bolts connected therewith on its upward movement. The downward and locking movement being caused wholly or partly by the gravity of the said rod. This general construction is shown and described in my Patent No. 1,117,457, of November 17, 1914. The rod may be moved upwardly by means of a panic bar, such as that shown in the said patent or any other suitable means. A sleeve C receives the threaded upper end of

the rod A and connects it with the rod E, to which the said sleeve is joined, the rod E extending upwardly therefrom into the housing H and connecting with the bolt B.

The upper end of the rod E is connected with the bolt B by means of the link consisting of the medial part L, the lower forks F spanning the reduced part E' of the rod, and the upper forks G similarly arranged with respect to the lower end of the bolt. The forks F are pivotally connected with the upper end of the rod at E' and with the tail B' of the bolt at J, the pivot J being out of alinement vertically and inside the pivot K of the bolt, so that the upward thrust of the rod communicated to the tail of the bolt through the link will cause the said bolt to rock on its pivot and withdraw its nose from the socket M. Movement of the rod in the opposite direction, will, therefore, cause the bolt to lock. In this manner a very simple, strong and positive connection between the vertically operating rod and the bolt is provided. The rod E extends through an opening H' in the bottom of the housing H, and is held against lateral movement in the direction of the door by the pin N extending through said housing.

If the bolt were not provided with the automatic dogging means it would return to its locking position as soon as the rod A was released and allowed to fall, and as this usually occurs during the opening movement of the door upper and lower bolts controlled by the rod would project therefrom upwardly and downwardly and strike anything in their path, to the injury of floors, floor coverings, and other parts, if not to the bolts, as hereinbefore noted. The rocking dog D is therefore provided for the purpose of detaining the bolt and holding it in its restricted position during the opening and closing movement of the door, and this also holds the rod A and any other bolts that may be connected therewith in unlocked position. The dog or detent D is pivoted by means of a pivot pin O extending there-through and secured at its ends in the housing, and the portion of this member normally below its pivot is made of greater thickness and weight than the upper part, so that when released it moves by gravity to the position shown in Fig. 4. When the door is closed, however, it is held out of this position by the lever R pivotally con-

ned with the dog D at P and pressed inwardly by contact of its enlarged upper end with the strike plate S depending from the socket plate.

5 The lever R oscillates on the pivot T by which it is mounted on the outside of the housing, and the pin P is secured to its lower end, extends through an opening in the housing and through the upper end of the dog D. When the door is closed there-
10 fore and the upper enlarged end of the lever R is pressed inwardly, the upper end of the dog is moved in the opposite direction and its lower weighted end raised. The devices
15 remain in this position while the door is closed. When the door is opened, however, the pressure on the upper end of the lever R is immediately released, and the weight of the lower end of the dog throws its up-
20 per end into the path of the pointed extremity of the bolt tail B', so that the bolt and the rod connected therewith cannot return to locking position. When the door
25 reaches its closed position, however, the upper end of the lever R is again thrown back by contact with the strike-plate S and the detent extremity of the dog D drawn out from under the tail B' so that the bolt is
30 incidentally shot and the door locked.

What I claim is:

1. The combination of a bolt, a pivot on which said bolt is mounted intermediate its
35 ends, said bolt comprising a locking portion on one side of the pivot adapted to move into and out of locking position when the bolt is oscillated and a tail portion on the
40 other side of the pivot, a rod mounted to reciprocate substantially in alinement with said locking portion and normally held by its gravity in bolt locking position, and a
45 connecting member between said rod and said tail portion and positively secured to both whereby lengthwise movement of the rod imparts movement to the bolt in sub-
50 stantially the opposite direction, the arrangement being such that when the rod moves toward the pivot the locking portion of the bolt moves toward the rod and from
55 its locking position, and when the rod moves away from the pivot the locking portion of the bolt moves away from the rod and to its locking position.

2. The combination of a bolt, a pivot on which said bolt is mounted intermediate its
60 ends, said bolt comprising a locking portion on one side of the pivot adapted to move into and out of locking position when the bolt is oscillated, and a tail portion on the
65 other side of the pivot, a rod mounted to reciprocate and normally held by its gravity in bolt locking position, and a connection between said rod and said tail portion whereby lengthwise movement of the rod imparts movement to the bolt in substan-
tially the opposite direction, the said con-

nection between the rod and the bolt comprising a link pivoted and positively connected to the rod and to the tail portion of the bolt, and arranged to move on lines angular to the movement of both rod and bolt.

3. The combination of a bolt, a frame in which said bolt is mounted, said frame arranged to be secured to a door, a socket
75 member adapted to be mounted in the frame of the door and arranged to be engaged by said bolt when a portion of said bolt is moved beyond its frame, automatic means for holding the bolt in its retracted position when it is not opposite the socket member,
80 a door on which the said parts are mounted, a stop adjacent the socket member, said means for holding the bolt comprising an arm and a detent movably mounted on the door, and a connection between said arm and
85 detent whereby movement of the former imparts a greater movement of a portion of the latter, the said stop being in the path of the arm and adapted to move the said arm when the door is closed and said arm brought in
90 contact with the stop.

4. The combination of a bolt, a frame in which said bolt is mounted, said frame arranged to be secured to a door, a socket member adapted to be mounted in the frame of
95 the door and arranged to be engaged by said bolt when a portion of said bolt is moved beyond its frame, automatic means for holding the bolt in its retracted position when it is not opposite the socket
100 member, a door on which the said parts are mounted, a stop adjacent the socket member, said means for holding the bolt comprising an arm and a detent movably mounted on the door, and a connection be-
105 tween said arm and detent whereby movement of the former imparts a greater movement of a portion of the latter, the said stop being in the path of the arm and adapted to move the said arm when the door
110 is closed and said arm brought in contact with the stop, said detent having a weighted portion constantly tending to move it into the path of a portion of the bolt by gravity, and the connection between it and the arm
115 being such that when the arm is moved from the stop the movement of the detent will cause a portion of the arm to move toward the stop.

5. The combination of a bolt, a frame in which said bolt is mounted, said frame arranged to be secured to a door, a socket member adapted to be mounted in the frame of
120 the door and arranged to be engaged by said bolt when a portion of said bolt is moved beyond its frame, and automatic means for holding the bolt in its retracted position when it is not opposite the socket member, said means comprising a detent normally in
125 the path of a portion of said bolt, but mov-

able out of said path, and means for moving the said detent from said path when the bolt is opposite the socket member, said last named means permitting it to move into said path when the bolt is moved away from the socket member, and said means comprising a projection adjacent to the socket member, and a movable part mounted adjacent to the detent, said projection and movable part coming in contact when the bolt and its socket member are opposite each other and moving the said detent through the movement of said part.

6. The combination of a bolt mounted on a door, a socket member mounted on a frame of the door, a rod connected with said bolt and mounted on the door, means for causing the said rod to move the bolt into and out of the socket, means for detaining the bolt when it has been withdrawn from the socket and is moved bodily out of alinement therewith comprising a dog normally in the path of said bolt, means for pressing said dog out of the path of said bolt when the bolt is in alinement with the socket, and means for releasing the said dog pressing means and permitting it to move into said path when the bolt is moved from said alinement, said dog pressing means and dog being pivotally mounted, and connected with each other, the connection being nearer to the pivot of the dog than to the pivot of the pressing means.

7. The combination of a bolt arranged to be mounted on the door, a socket member arranged to be mounted on the frame of the door opposite the position of the bolt when the door is closed, a rod connected with said bolt and mounted on the door, and means for causing the said rod to move the bolt into and out of its socket, means for detaining the bolt when it has been withdrawn from its socket and is moved laterally therefrom, comprising a dog normally in the path of said bolt, means for moving it out of the path of said bolt when the door is closed, means for releasing it and permitting it to move into said path when the door is moved from its closed position, said means for moving the dog and said dog being movably mounted at points adjacent to each other, and being connected at a point nearer to the point at which the dog is mounted than that at which the moving means is mounted.

8. The combination of a bolt, a socket member adapted to receive said bolt, means for moving the bolt to and from said socket member, and means adapted to be interposed in the path of the bolt to detain it out of engagement with said socket member, comprising a dog normally located in the path of said bolt member and a movable arm connected with said dog for moving the same out of said path, the said dog having means associated therewith for automatically moving

it into said path when released by the arm.

9. The combination of a bolt, a socket member adapted to receive said bolt, means for moving the bolt to and from said socket member, and means adapted to be interposed in the path of the bolt to detain it out of engagement with said socket member, comprising a dog normally located in the path of said bolt member and a movable arm connected with said dog for moving the same out of said path, the said dog having means to return it automatically to said path when released by the arm, said means also bearing on the arm and tending to return it to its normal position.

10. The combination of a bolt, a socket member adapted to receive said bolt, a bar mounted to move downwardly by its gravity, means for moving said bar upwardly, said bolt having a socket engaging portion and a connecting portion, and being pivoted, a connection between the bar and the bolt on a side of the pivot opposite the said engaging portion, and means for holding the said connecting portion and bar in a position in which the bolt is retracted against the gravity of the bolt.

11. The combination of a bolt, a socket member adapted to receive said bolt, a bar mounted to move downwardly by its gravity, means for moving said bar upwardly, said bolt having a socket engaging portion and a connecting portion, and being pivoted intermediate the two portions, a connection between the bar and the connecting portion of the bolt, and means for holding the said connecting portion and bar in a position in which the bolt is retracted and for releasing the same, said means comprising a dogging device mounted adjacent to the bolt and normally in the path thereof, an arm pivoted adjacent thereto and connected with the dogging device, and a strike on the frame of the door in the path of said arm, the said arm having a weighted portion holding it in its normal position by gravity.

12. The combination of a bolt, a socket member adapted to receive said bolt, means for moving the bolt to and from said socket member, and means adapted to be interposed in the path of the bolt to detain it out of engagement with said socket member, comprising a dog normally located in the path of said bolt member and a movable arm connected with said dog for moving the same out of said path, the said dog constructed to return automatically to said path when released by the arm.

13. The combination of a bar vertically mounted to reciprocate and tending constantly to move downwardly, a bolt pivotally mounted and having portions extending on two sides of its pivot, a socket member

adapted to receive one of said portions and a flexible connection between the said bar and the other portion, the construction and arrangement being such that downward movement of the bar causes pivotal movement of the bolt to bring the first named portion in engagement with the socket member, and means for automatically holding the said portion out of engagement with the socket member and holding the bar in elevated position when the said portion is moved away from the socket member and for automatically releasing the same when the said portion is brought to the socket member.

14. The combination of a bolt, a socket member adapted to receive said bolt, means for moving the bolt to and from said socket member, and means adapted to be interposed in the path of the bolt to detain it out of engagement with said socket member, comprising a dog normally located in the path of said bolt member and a movable arm connected with said dog for moving the same out of said path, the said dog constructed to return automatically to said path when released by the arm, and the construction and arrangement being such that the said arm is held in its normal position by the said dog while the said dog is in its normal position.

15. The combination of a bolt, a pivot on which said bolt is mounted intermediate its ends, said bolt comprising a locking portion on one side of the pivot adapted to move into and out of locking position when the bolt is oscillated and a tail portion on the other side of the pivot, a rod mounted to reciprocate and normally held by its gravity in bolt locking position, and a connection between said rod and said tail portion

whereby lengthwise movement of the rod imparts movement to the bolt in substantially the opposite direction, the arrangement being such that when the rod moves toward the pivot, the locking portion of the bolt moves toward the rod and from its locking position, and when the rod moves away from the pivot the locking portion of the bolt moves away from the rod and to its locking position, and a blocking device movably mounted and normally in the path of a portion of said bolt, when the said bolt is in unlocked position, and means for automatically moving the same from said path when the locking portion of the bolt is brought to a position in which it is adapted to cooperate with a bolt receiving device.

16. The combination of a bolt member, a socket member adapted to receive said bolt member, means for moving the bolt to and from said socket member, and means adapted to be interposed in the path of the bolt to detain it out of engagement with said socket member, comprising a dog normally located in the path of said bolt member, a movable arm connected with said dog, a strike device in the path of said arm arranged to engage said arm when the same approaches closed position, and to cause said arm to move the dog out of the path of the bolt member, said dog being constructed and arranged to move into the path of said bolt member on the opening movement of the parts in advance of the return of said arm to normal position when the said bolt member is moved from the socket member.

Witness my hand this 2nd day of March, 1918, at the city of New York, in the county and State of New York.

FRANK F. SMITH.