

E. H. McCLOUD.
 AUTOMATIC FIRE SHUTTER.
 APPLICATION FILED MAR. 28, 1912.

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 2 SHEETS—SHEET 1.

1,052,735.

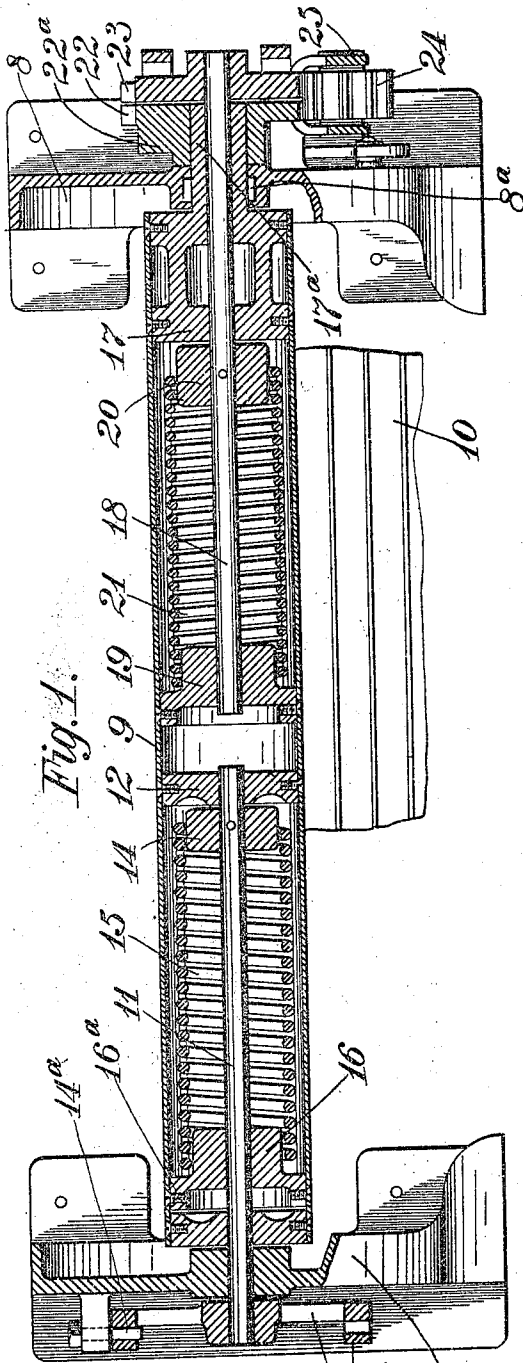


Fig. 1.

Witnesses
 Benjamin Linckel
 Donald W. Kling.

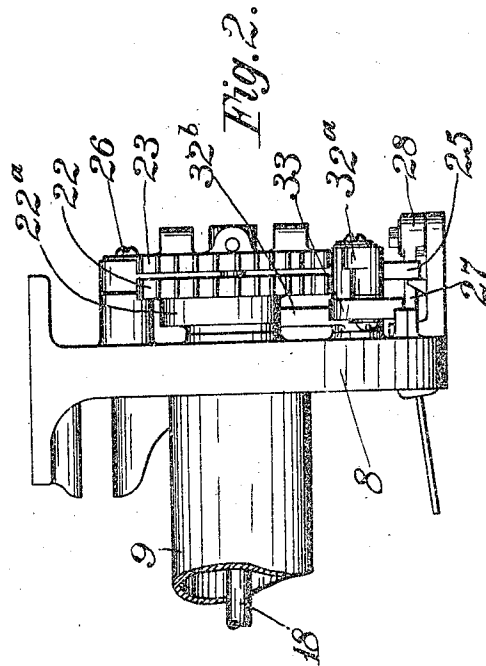


Fig. 2.

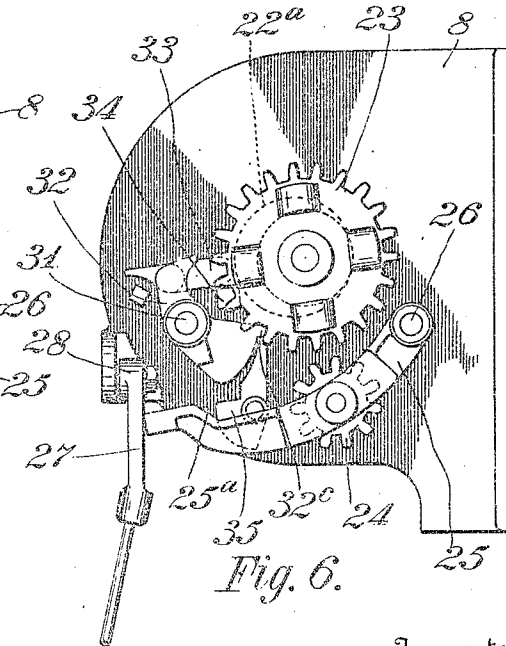
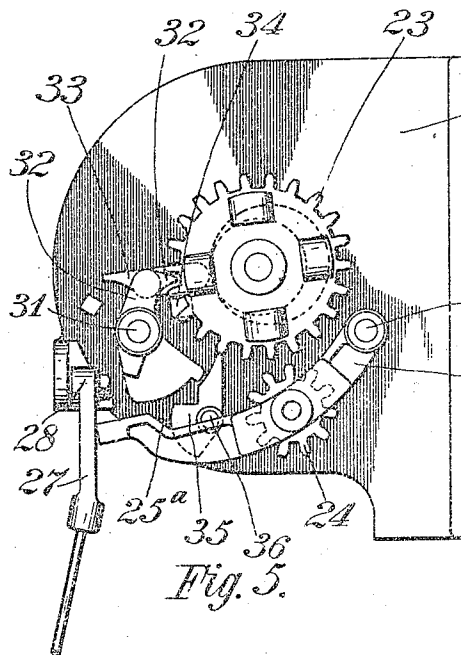
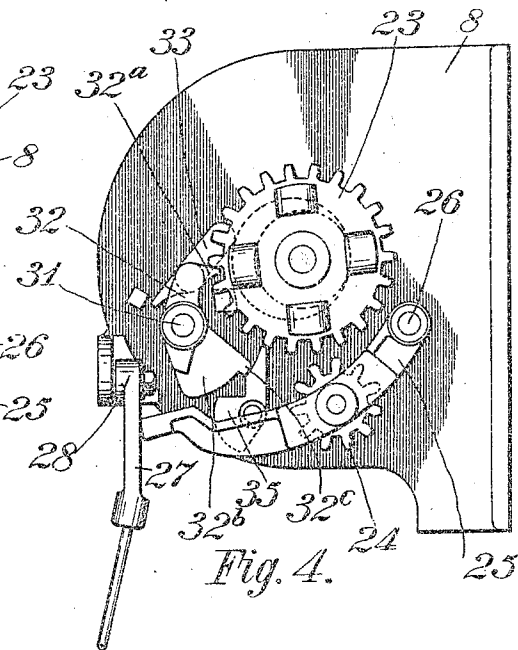
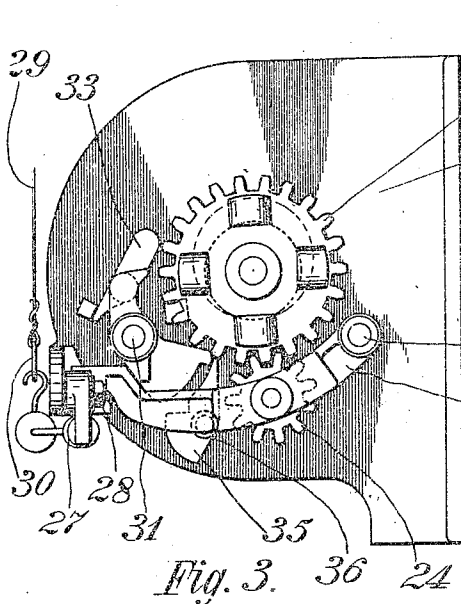
Inventor
 Edward H. McCLOUD
 by Lincoln Finckel
 his Attorneys

E. H. McCLOUD.
AUTOMATIC FIRE SHUTTER.
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2 SHEETS—SHEET 2.

1,052,735.



Witnesses
Benjamin Finckel
Ada G. Gambo.

Inventor
Edward H. McCloud
by Finckel Finckel
his Attorneys

UNITED STATES PATENT OFFICE.

EDWARD H. McCLOUD, OF COLUMBUS, OHIO, ASSIGNOR TO THE KINNEAR MANUFACTURING COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF WEST VIRGINIA.

AUTOMATIC FIRE-SHUTTER.

1,052,785.

Specification of Letters Patent.

Patented Feb. 11, 1913.

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To all whom it may concern:

Be it known that I, EDWARD H. McCLOUD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Automatic Fire-Shutters, of which the following is a specification.

This invention relates more particularly to that class of fire shutters that are normally operable for raising and lowering and have means for releasing them in case of imminent fire.

The object of the invention is to provide improved means of the kind stated and the invention is embodied in the example herein shown and described, the features of novelty being pointed out in the claims.

In the accompanying drawings forming part hereof—Figure 1 is a vertical sectional view taken longitudinal of the barrel, some parts being shown in full lines. Fig. 2 is a detail in plan view of the end that contains the releasing devices. Fig. 3 is an end elevation of the releasing devices showing them arranged for automatic operation. Fig. 4 is a similar view showing the releasing devices released. Fig. 5 is a similar view of another position of the operated devices during the descent of the shutter. Fig. 6 is a similar view showing the position of said devices when the shutter is being coiled up preparatory to resetting the devices for automatic release or to normal position.

In the views 7 and 8 designate suitable end brackets. 9 designates the barrel and 10 a fraction of the shutter attached thereto. The barrel is supported at one end by means of a shaft member 11 extending through and capable of being turned in the bracket 7 for adjustment of a spring connected with it. At its inner end the shaft member 11 is supported in a plug 12 screwed to the barrel and said shaft member is secured from turning by means of a wheel 13 engaged by a removable pin 14^a on the bracket, the pin extending into one of a number of perforated ears 13^a on the wheel.

Secured on a collar 14 pinned to the shaft 11 is one end of a coil spring 15 having its other end secured to a collar 16 that is fastened to the barrel. The function of the coil spring 15 is to normally counterbalance the shutter or so as to make it easy to coil up on the roller and hold it in raised position.

The tension of the spring 15 on the shaft can be changed by adjusting the shaft 11. The character 16^a designates a plug secured in the end of the barrel next the bracket 7 to close up that end of the barrel. The other end of the barrel is provided with a plug 17 having an integral extension 17^a that projects through an opening in the bracket 8, said opening being shown as provided with roller bearings 8^a. Extending into the barrel and through an axial perforation forming a bearing in the plug 17 and its extension 17^a is another shaft member 18. The shaft member 18 is supported at its inner end in a plug 19 that is secured by screws to the barrel. Pinned on the shaft member 18 is a collar 20 and secured at one end to said collar is a coiled spring 21, the other end of said spring being secured to the plug 19. The spring 21 is designed to be wound to act counter to the stress or torque of the spring 15 and at the proper time to uncoil the shutter.

Secured on the outer end of the plug extension 17^a is a toothed wheel 22 and secured on the outer end of the shaft 18 beyond but close to the wheel 22 is a similarly toothed wheel 23. The two toothed wheels 22 and 23 can be engaged as one by a toothed wheel 24, when held up, said wheel 24 being journaled in a lever 25 fulcrumed on a pin 26 on the outer face of the bracket 8. The said lever 25 is normally held up with the toothed wheel 24 engaged with the wheels 22 and 23 by means of a lever 27 fulcrumed at 28 on the bracket 8 and a sectional wire 29 containing one or more fusible connections 30 and fastened at its upper end to a suitable fixed point on the building.

Pivoted at 31 on the outer face of the bracket 8 is a lever dog or pawl 32 having at its upper end a beak or tooth 32^a adapted when liberated to engage a tooth of the wheel 23 only, the lower end of said dog being weighted at 32^b to throw the beak toward said wheel 23. The beak or tooth of said pawl is normally held disengaged from the wheel 23 by means of a shoulder 25^a on the lever 25 when the latter is held up as before stated. Pivoted on the upper end of the pawl 32 is a dog 33 adapted to be impinged at one end by an eccentric rim 22^a on the inner side of the toothed wheel 22. Normally said impinged end of the dog 33 rests on said eccentric; at other times it

rests on a stud 34 projecting from the face of the bracket 8. The lower portion of the pawl 32 is provided with a toe 32^a adapted to be engaged by the upper end of a dog 33 pivoted at 36 on the face of the bracket when the pawl 32 is pushed out at its upper end by the action of the eccentric 22^a on the dog 33 when the shutter is coiled up after it has been released.

10 The position of the parts as shown in Fig. 1 is for normal operation of the shutter, the levers 27 and 25 being depicted as held up for release upon a dangerous rise of temperature. In Fig. 2 the said levers are
15 shown as released and separated and the pawl 32 thrown into engagement with the toothed wheel 23. Because the position of the eccentric 22^a is indeterminate the dog 33 is provided, and in the position of the
20 parts in Fig. 2 the eccentric interferes with the completion of its movement. In Fig. 3 the eccentric 22^a, as shown by broken lines, having moved to the opposite side, the dog 33 is permitted to drop upon the lug 34
25 projecting from the face of the bracket. When the eccentric 22^a rotates with the barrel in the direction of the descending shutter the dog 33 rises and falls with each rotation. The pushing up of the shutter or
30 the rotation of the barrel in the reverse or shutter winding direction causes the eccentric 22^a to bear down and outward upon the dog 33 thereby moving the pawl out of engagement with the wheel 23 and releasing
35 the spring 21 and permitting the shutter to be raised without resistance from it. In other words the spring 15 is relieved of the counter effect of the spring 21 and the shutter restored to normal balanced condition.
40 After an actuation of the releasing devices and the spring 21, said spring can be re-wound by turning the shaft 18 in the proper direction to act when again released to uncoil the shutter. In operation the tension on
45 the spring 15 is increased or decreased without affecting the tension of the spring 21 because the latter turns with the barrel in a uniformly tensioned condition. The tension of the spring 21 is constantly, in normal
50 position, on the teeth of the wheel or pinion 24. When the thermally controlled levers 27 and 25 are released as by a dangerous rise of temperature said levers swing downward but before the pinion or gear 24 escapes
55 from the wheels 22 and 23 the beak of the pawl 32 is thrown into locking engagement with the wheel 23. Therefore, because, said wheel 23 is locked by means of pawl 23 to the bracket 8 the end of the spring on the
60 shaft 21 becomes fixed and its torque is exerted on the plug or collar 9 and barrel to uncoil the shutter.

What I claim is:

1. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter

thereon, a tension member rotating with the shutter-receiving member, and means for releasing said tension member to operate on the shutter receiving member to close the shutter.

2. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter thereon, a tension member rotating with the shutter-receiving member, means for holding said tension member tensioned with the shutter-receiving member, and means for releasing said holding means to permit the tension member to close the shutter.

3. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter thereon, a shaft in one end thereof, a tension member connected with the shaft and shutter-receiving member, toothed wheels on the shutter-receiving member and said shaft, movable means carrying a wheel to engage both said wheels and permit their rotation, and a pawl controlled by said means for engaging the toothed wheel of the shaft member when the wheel engaging both toothed wheels is withdrawn.

4. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter thereon, a tension member within the shutter-receiving member and rotative therewith and means for releasing said tension member to operate on the shutter receiving member to close the shutter.

5. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter thereon, a tension member within the shutter-receiving member and rotative therewith, and means at the exterior of the shutter-receiving member for releasing said tension member to operate on the receiving member to close the shutter.

6. In a fire shutter, in combination, a shutter-receiving member and shutter thereon, a tension member to cause the closing of the shutter, means rotating with the shutter-receiving member for locking said tension member in tensioned condition, and means connected with a fixed part for releasing such tensioned member for action on the shutter-receiving means to cause the shutter to close.

7. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter thereon, a shaft in one end of said receiving member, a tension member connecting said shaft and shutter-receiving member, toothed wheels on the shutter-receiving member and said shaft, movable means carrying a wheel to engage both said wheels and permit their rotation, and means automatically operative to engage the toothed wheel of the shaft member when the wheel engaging both toothed wheels is withdrawn.

8. In a fire shutter, in combination, a rotary shutter-receiving member and a shaft thereon, a shaft in one end of said receiving

member, a tension member connecting said shaft and receiving member, toothed wheels on the shutter-receiving member and said shaft, movable means carrying a wheel to
 5 engage both said wheels and permit their rotation, means automatically operative to engage the toothed wheel of the shaft member when the wheel engaging both toothed
 10 wheels is withdrawn, means for automatically causing the disengagement of said means when the shutter is raised after its release and automatically operative means to hold said means disengaged.

9. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter
 15 thereon, a tension member for the normal operation of the shutter, a second tension member rotating with the shutter-receiving member and means for releasing said last
 20 named tension member to operate on the shutter-receiving member to close the shutter.

10. In a fire shutter, in combination, a rotary shutter-receiving member and a shutter
 25 thereon, a shaft in one end of said receiving member, a tension member connecting said shaft and receiving member, toothed wheels on the shutter-receiving member and said shaft, movable means carrying a wheel to engage both said wheels

and permit their rotation, and means automatically operative to engage the toothed
 30 wheel of the shaft member to hold the same when the wheel engaging both toothed wheels is withdrawn and an eccentric device on said shutter-receiving member to release
 35 said shaft holding means.

11. In a fire shutter, in combination, a shutter, a barrel and end brackets for supporting the same at its ends, a plug in one
 40 end of said barrel having an extension through the adjacent bracket, a toothed wheel secured on said extension, shaft extending through said plug and extension into the barrel and having a toothed wheel,
 45 a spring connecting said shaft and barrel, said shaft being rotative with respect to the barrel to tension the spring, movable means to jointly engage said toothed wheels to lock
 50 said shaft from rotation with respect to the barrel but permit the barrel and spring to rotate and means to automatically engage and hold said shaft from rotation when said jointly engaging means is released from the toothed wheel of the barrel.

EDWARD H. McCLOUD.

Witnesses:

ALBERT RUST,

ANNA TERESA KING.