





948,239.

F. McMANUS.  
FIREPROOF SHUTTER MECHANISM.  
APPLICATION FILED MAY 27, 1909.

Patented Feb. 1, 1910.

3 SHEETS—SHEET 2.

Fig. 2.

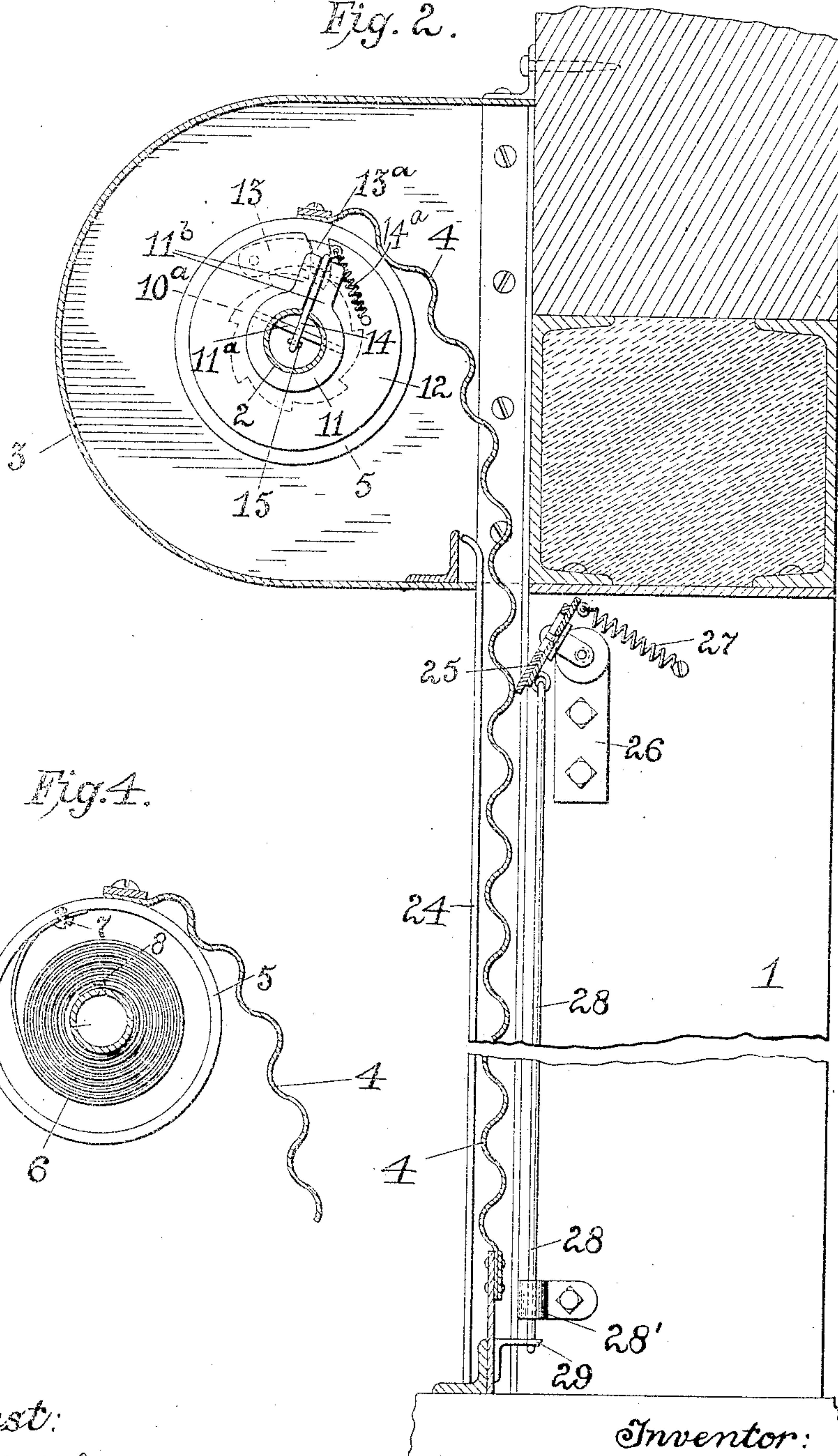
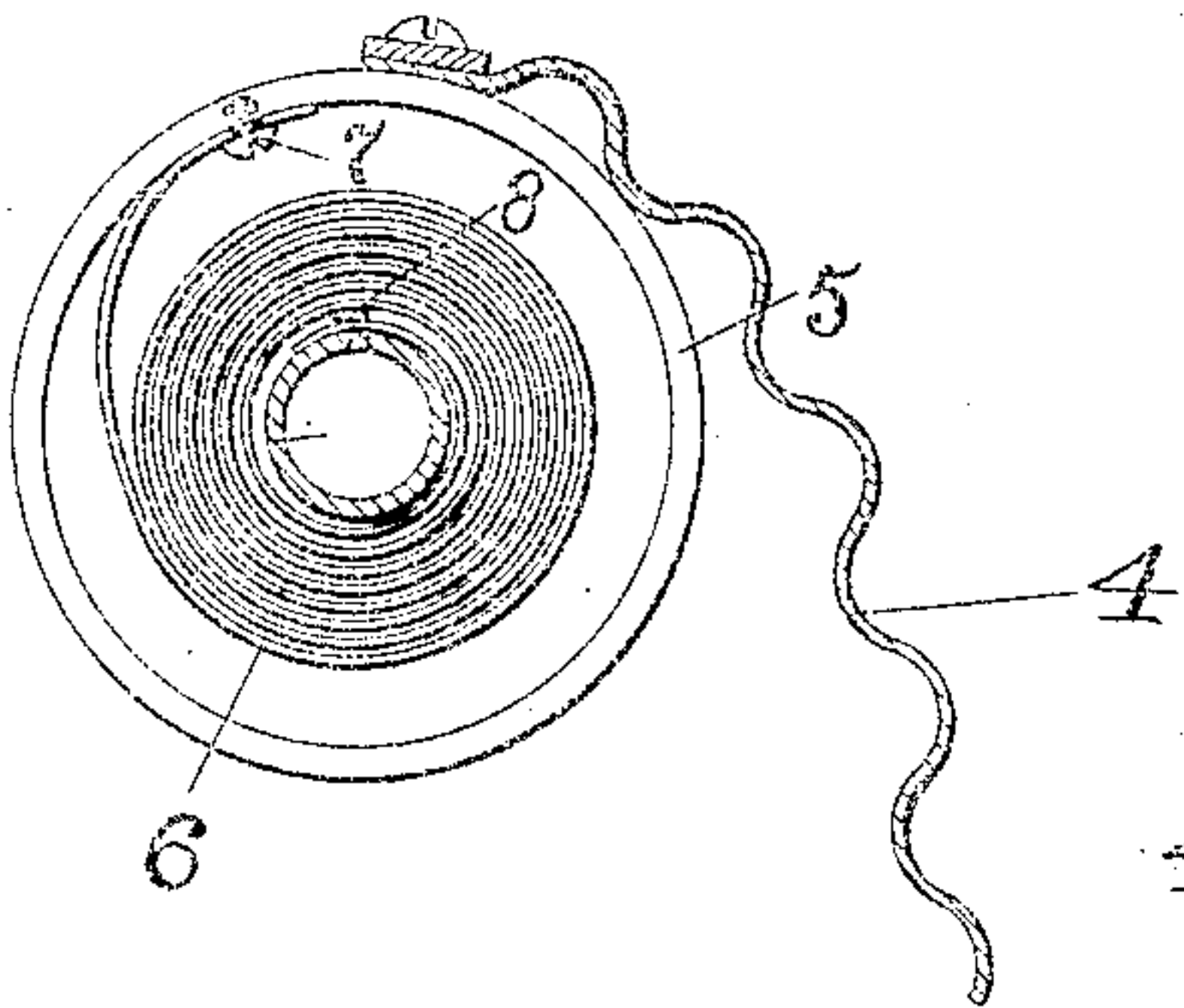


Fig. 4.



Attest:  
Edw. A. Tolson.

By *Bent M. Stahl* By *Year Middleton Donaldson & Pear*  
*Atty's.*

Inventor:

Frank McManus,

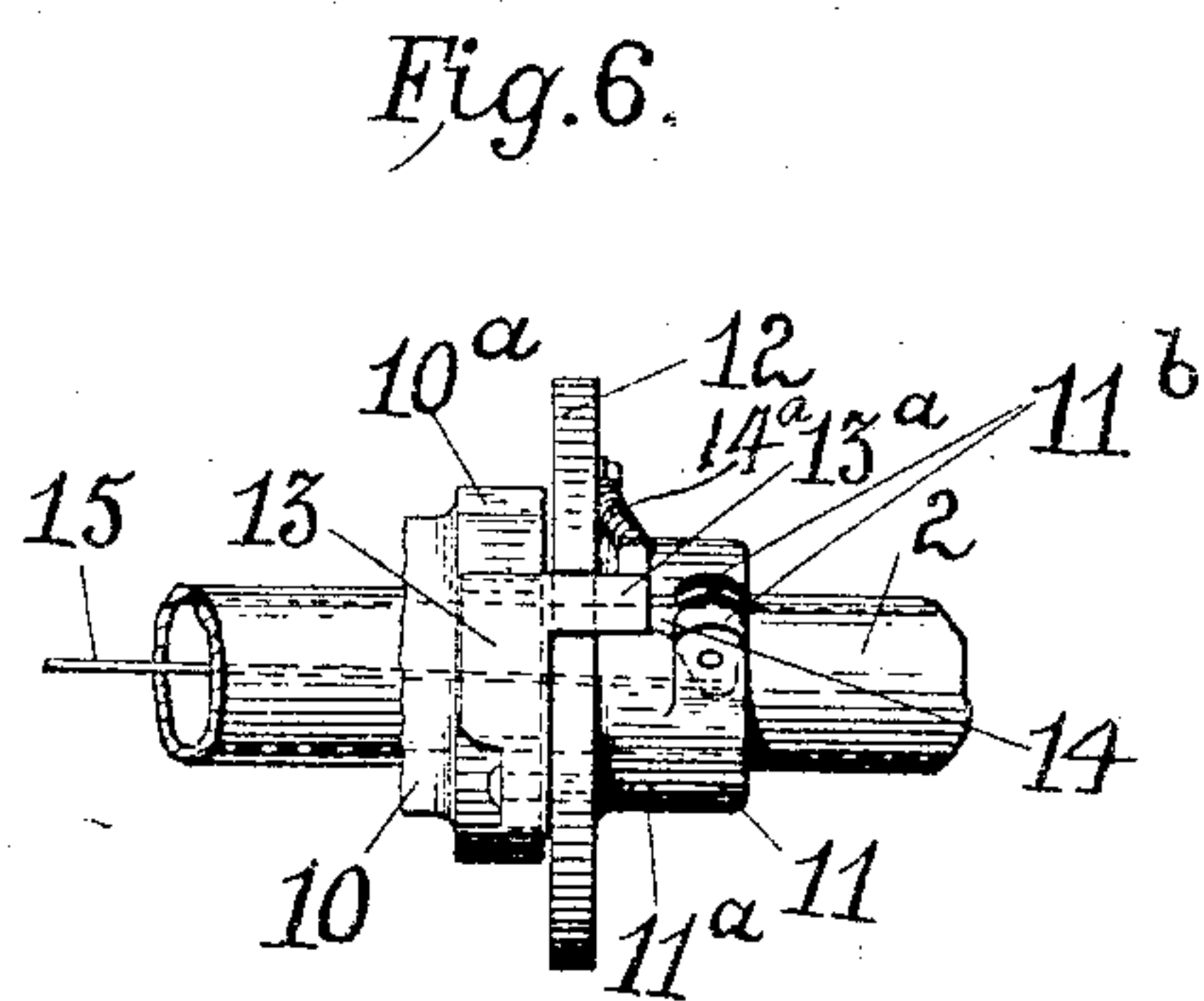
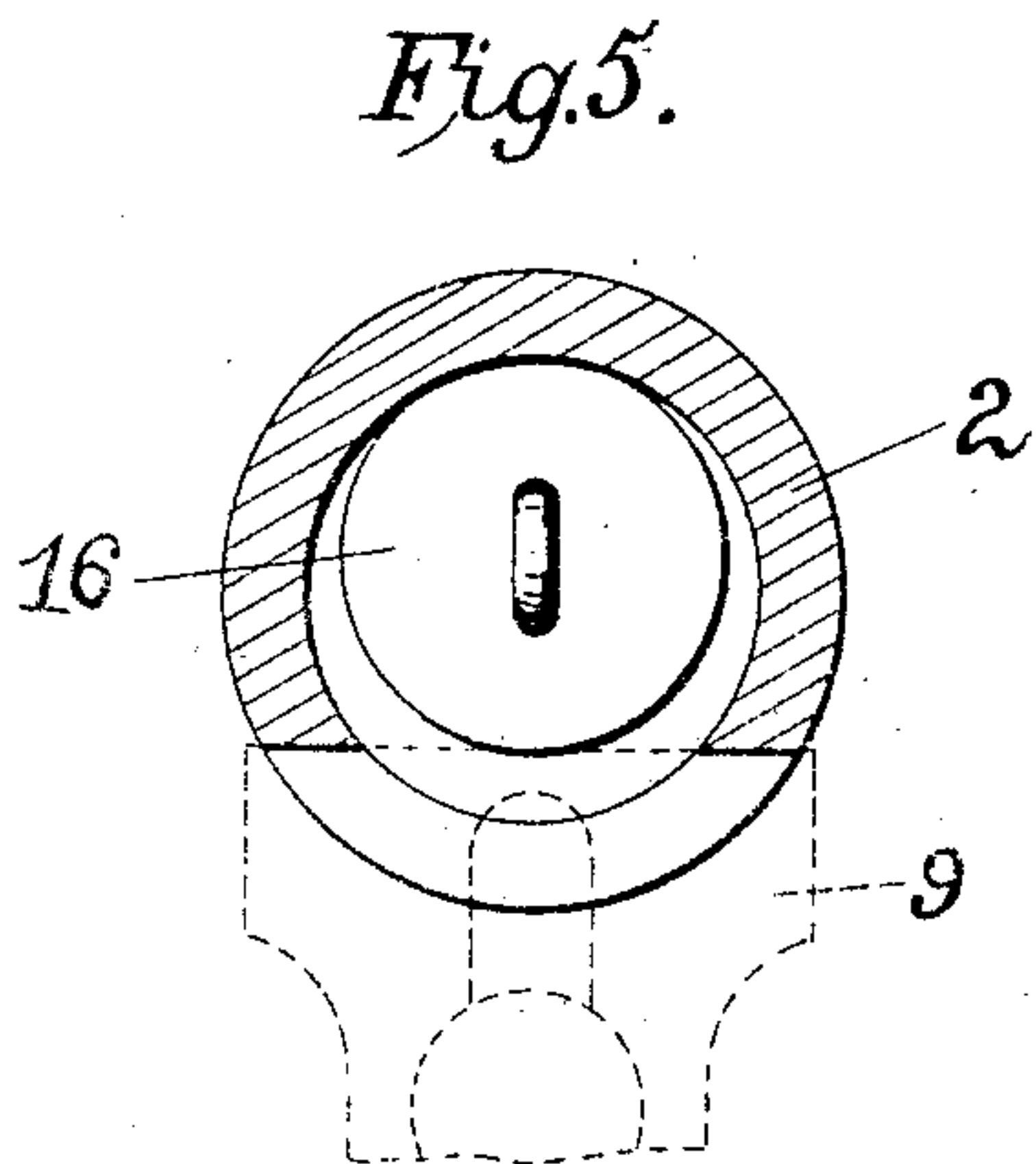
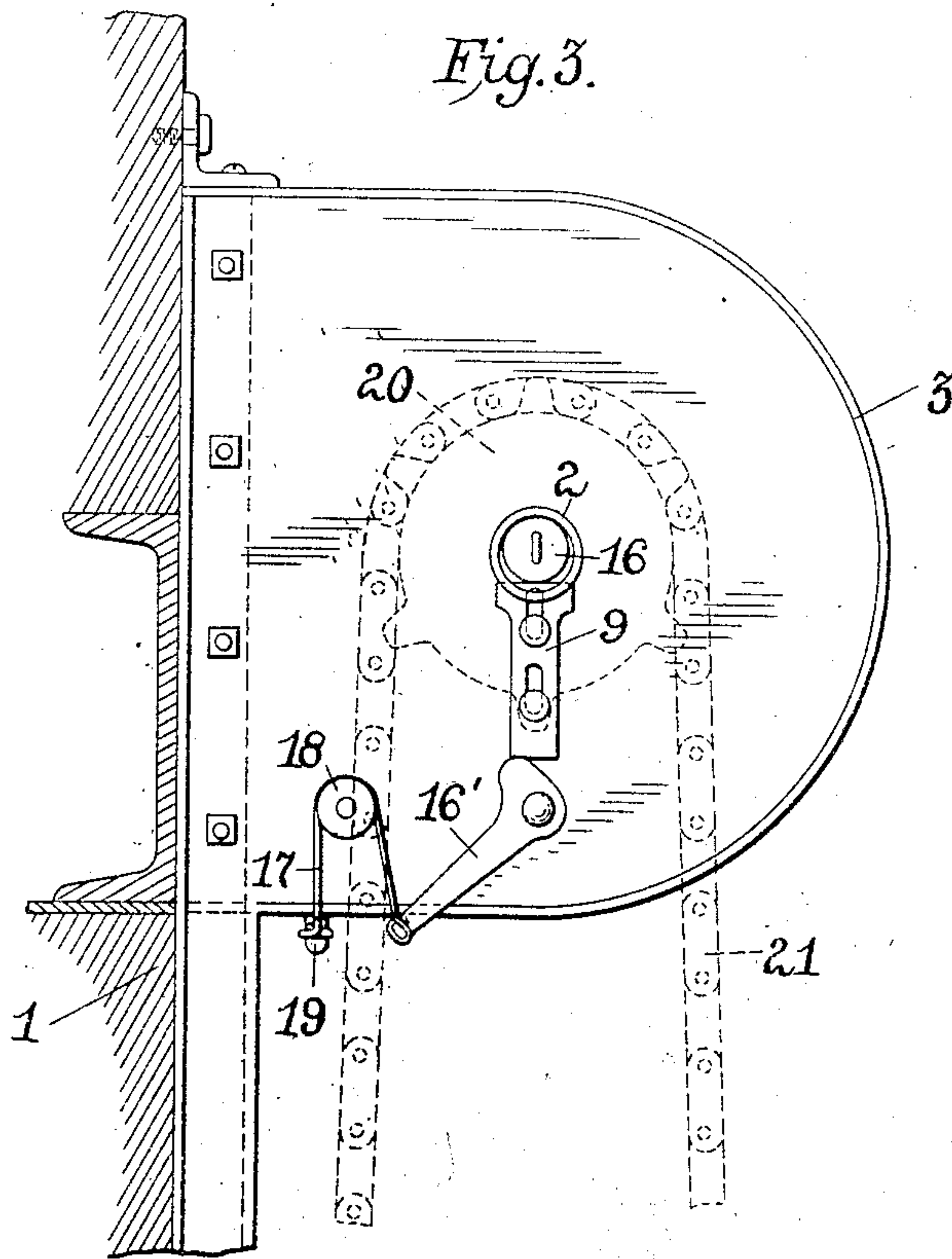


F. McMANUS.  
FIREPROOF SHUTTER MECHANISM.  
APPLICATION FILED MAY 27, 1909.

948,239.

Patented Feb. 1, 1910.

3 SHEETS—SHEET 3.



Attest:  
Edw. C. Tolson,  
Bent. M. Stahl.

Inventor:  
Frank McManus,  
By Spear, Middleton, Donaldson & Spear  
Attys.



# UNITED STATES PATENT OFFICE.

FRANK McMANUS, OF SOUTH NORFOLK, VIRGINIA.

FIRE-PROOF SHUTTER MECHANISM.

948,239.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed May 27, 1909. Serial No. 498,662.

*To all whom it may concern:*

Be it known that I, FRANK McMANUS, a citizen of the United States, residing at South Norfolk, Virginia, have invented certain new and useful Improvements in Fire-proof-Shutter Mechanism, of which the following is a specification.

My present invention relates to improvements in fire-proof curtains of the type which are normally capable of being easily raised and lowered by hand, but which, if raised at the time a fire occurs, will be automatically closed.

Among the objects of the invention are to provide a simple, economical, and efficient construction by which the curtain will be automatically dropped in case of fire without permitting the counterbalancing spring to unwind; to so construct and arrange the parts that the curtain may be easily reset; to provide for the ready adjustment of the counterbalancing spring, and to provide means for effecting a tight closure between the top of the window frame and the curtain without interfering with the free movement of the latter.

With these and other objects in view, the invention includes the novel features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

An embodiment of my invention is illustrated in the accompanying drawing, in which:—

Figure 1 is a front view, partly in section, of a portion of a window frame with my shade supporting apparatus applied thereto. Fig. 2 is a transverse section on line 2—2 of Fig. 1. Fig. 3 is an end view and Figs. 4, 5 and 6 are details.

Referring by reference characters to these figures, the numeral 1 designates a sufficient portion of a window frame to illustrate the application of my invention thereto. At 2 is shown a hollow shaft which is journaled in suitable bearings at the ends of a casing or housing 3 in which the shutter 4 is designed to be contained when in a raised or wound up condition. The shutter 4 may be of the ordinary or any desired flexible fire-proof material and is connected at its upper edge to a plurality of spring drums 5, which are rotatably mounted on the shaft and contain coiled springs 6, each of which is con-

nected at one end to the drum as indicated at 7, and at the opposite end to the shaft as indicated at 8. The shaft is normally held stationary by slides 9 which project into openings in the shaft and lock it against rotation; and it will thus be seen that the springs counterbalance the weight of the shutter making it capable of being easily raised and lowered by hand under normal conditions. I provide as many of these drums as the size of the shutter necessitates, but if the width of the shutter necessitates more than two, I provide a slightly different type of drum for location intermediate of the end drums, such drums being indicated at 5<sup>a</sup>, and being simply a plain drum rotatably mounted upon the shaft and held against longitudinal movement thereon by any suitable means, such for instance as keys 5<sup>b</sup> and 5<sup>c</sup>.

As I aim to release the shaft in case of fire to allow the shutter to drop by gravity, it is necessary that one or more, and preferably the two end drums 5 should be locked to the shaft at the time the shaft is released, so that the spring may not be unwound. In order to accomplish this I provide each drum 5 with a hub extension 10, which is provided with a ratchet wheel 10<sup>a</sup>. Adjacent this ratchet wheel is located a collar 11, preferably pinned to the shaft as indicated at 11<sup>a</sup> and provided with a flange or disk 12 to which is pivoted a dog or pawl 13 adapted to engage the teeth of the ratchet wheel and thus hold the drum and shaft against relative rotation under the action of the spring. The pawl 13 is provided with a projection 13<sup>a</sup> extending through a slot in the disk 12 designed to be engaged by one arm of a bell-crank lever 14 which is pivoted between projections 11<sup>b</sup> of the collar and pressed upon by spring 14<sup>a</sup>, the other arm of the bell crank lever being connected by a wire 15 with a plug 16 located in the outer end of the hollow shaft. Under normal conditions this plug is engaged by the same locking bolt 9 that holds the shaft against movement and is held in such position that the bell crank lever is tilted to hold the pawl out of engagement with the ratchet wheel. The locking slides 9 are held elevated by cam levers 16<sup>b</sup>, which are connected by wires 17 passing over guide pulleys 18 being connected at the



center by a fusible link 19 as shown. When the fusible link is melted, as occurs in case of fire, the wires 17 being released and the cam levers 16' dropped, the slides 9 move downward. Their first movement naturally releases the plugs, allowing them to move inward and the bell crank levers to swing under the tension of the springs 14<sup>a</sup>, dropping the pawls into engagement with the ratchet wheels and locking the drums to the shaft. The further downward movement of the locking bars 9 releases the shaft and as there is no longer any spring tension applied to the shutter, it immediately drops. In order to raise the shutter again, I provide a sprocket wheel 20 at one end of the shaft over which I will pass a chain 21 leading down to a similar sprocket wheel 22 provided with an operating crank or handle. When it is desired to restore the parts to their original condition, the shaft is first rotated by the chain and sprocket just described to raise the shutter to its original position, whereupon the wires or cables 17 are drawn sufficiently to cause the slides 9 to move into the slots in the shaft far enough to prevent the shaft from rotating. While the shaft is so held the shutter is pulled down just sufficiently to release the pressure on the pawls, whereupon the plugs are drawn out by the wires 23 attached thereto and projecting out through the ends of the hollow shaft until the tension has raised the pawls clear of the ratchet. Then the wires or cables 17 are drawn to their final tension, causing the slides to come in contact with the plugs holding both the plugs and the shaft rigid. This being done the spring drums are free to revolve on the shaft when the shutter is raised and lowered, the shutter being preferably counterbalanced by the springs. By this arrangement there is no re-winding of the springs required after the shutter has been automatically dropped. It will be readily seen that as many intermediate drums 5<sup>a</sup> without locking mechanism may be provided as the width of the curtain may require, the unwinding of the springs of the intermediate drums being prevented by the locking mechanism attached to the end drums.

The shutter is guided in its vertical movement at its edges by guides 24. It is difficult to make a tight or fire-proof joint between the shutter and the top of the window casing without interfering with the free movement of a shutter of this character.

To provide for the automatic closing of the space at the top of the window casing, I provide a plate 25 which is pivoted upon brackets 26 attached to the sides of the window casing and is normally held drawn back in a horizontal position by springs 27. A rod 28 extends down on each side of the

window through a guide 28' and has its lower end bent at right angles so as to lie in the path of a knee or angle piece 29 carried by the lower edge of the shutter.

It will thus be seen that when the shutter fastens, its angle piece comes in contact with the bent end of the rods pulling them downward and tilting the closing plate over so as to bring its edge into contact with the face of the shutter, making a tight joint.

The plate 25 is preferably composed of two plates, the one slidably mounted on the other, so that when the parts are in the position shown in Fig. 2, the upper plate will tend to be held by gravity with its edge in contact with the face of the curtain, the sliding movement being permitted by the pin and slot connection shown in said figure.

Having thus described my invention what I claim is:—

1. In combination, a shaft, a drum rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drum, a spring interposed between the drum and the shaft for counterbalancing the weight of the shutter, fusibly released means for normally holding the shaft against rotation, and means for automatically locking the drum to the shaft when the shaft has been released by the fusible means.

2. In combination, a shaft, a drum rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drum, a spring interposed between the drum and the shaft for counterbalancing the weight of the shutter, fusibly released means for normally holding the shaft against rotation, and pawl and ratchet mechanism for automatically locking the drum to the shaft when the shaft has been released by the fusible means.

3. In combination, a shaft, a drum rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drum, a spring interposed between the drum and the shaft for counterbalancing the weight of the shutter, fusibly released means for normally holding the shaft against rotation, a ratchet wheel carried by the drum, a pawl supported from the shaft, a dog for normally holding the pawl out of engagement with the ratchet wheel, and means for causing the dog to release the pawl when the fusible means is melted.

4. In combination, a hollow shaft, a drum rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drum, a spring interposed between the drum and the shaft for counterbalancing the weight of the shutter, fusibly released means for normally holding the shaft against rotation, a ratchet wheel fixed to the drum, a collar fast on the shaft in proximity to the ratchet wheel, a spring pressed pawl carried by the



collar, a bell crank lever pivoted to the collar and having one end operatively engaging the pawl, and a tension member extending inside the hollow shaft and connected with the other arm of the bell crank lever, and means for releasing said tension member when the fusible means is melted.

5. In combination, a shaft, a drum rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drum, a spring interposed between the drum and the shaft for counterbalancing the weight of the shutter, a sliding locking device for engaging the shaft to hold it against rotation, fusibly released means for normally holding said device in locking position and normally inactive means for locking the drum to the shaft, said last named means being rendered active to lock the drum to the shaft on the release of the sliding locking means by the fusible means.

6. In combination, a hollow shaft, a drum rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drum, a spring interposed between the drum and the shaft for counterbalancing the weight of the shutter, said shaft having an opening therein, a sliding locking device for engaging said opening to hold the shaft against rotation, fusibly released means for normally holding said locking device in locking position, a ratchet wheel carried by the drum, a pawl carrying member carried by the shaft, a pawl on said member for engaging the ratchet wheel, a bell crank lever carried by the pawl carrying member and having an arm adapted to raise said pawl out of engagement with the ratchet wheel, a tension member connected to the other arm of the bell crank lever, and a plug connected to

the tension member and normally engaged by the said sliding locking device.

7. In combination, a shaft, a plurality of drums rotatably mounted on the shaft, a fire resisting shutter or curtain connected to the drums, springs interposed between the drums and the shaft for counterbalancing the weight of the shutter, fusibly released means for normally holding the shaft against rotation, and means for automatically locking one or more of the drums to the shaft when the shaft has been released by the fusible means.

8. In combination with a window frame and an automatically closing fire proof shutter, of an auxiliary closing device movably mounted at the top of the window frame, and means whereby the closing of the shutter automatically moves the said auxiliary closing device to close the space between the top of the window frame and the shutter.

9. In combination with a window frame, an automatically closing shutter, an auxiliary closing device pivotally mounted within the window frame at the top thereof, a spring for normally holding said auxiliary closing device in a horizontal position, a rod depending from the outer edge of said auxiliary closing device, and a part carried by the shutter adapted to engage a projection on the rod to automatically tilt said auxiliary closing device to bring its edge in contact with the shutter.

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

FRANK McMANUS.

Witnesses:

R. L. TAYLOR,

his  
GEORGE X SCOTT.  
mark