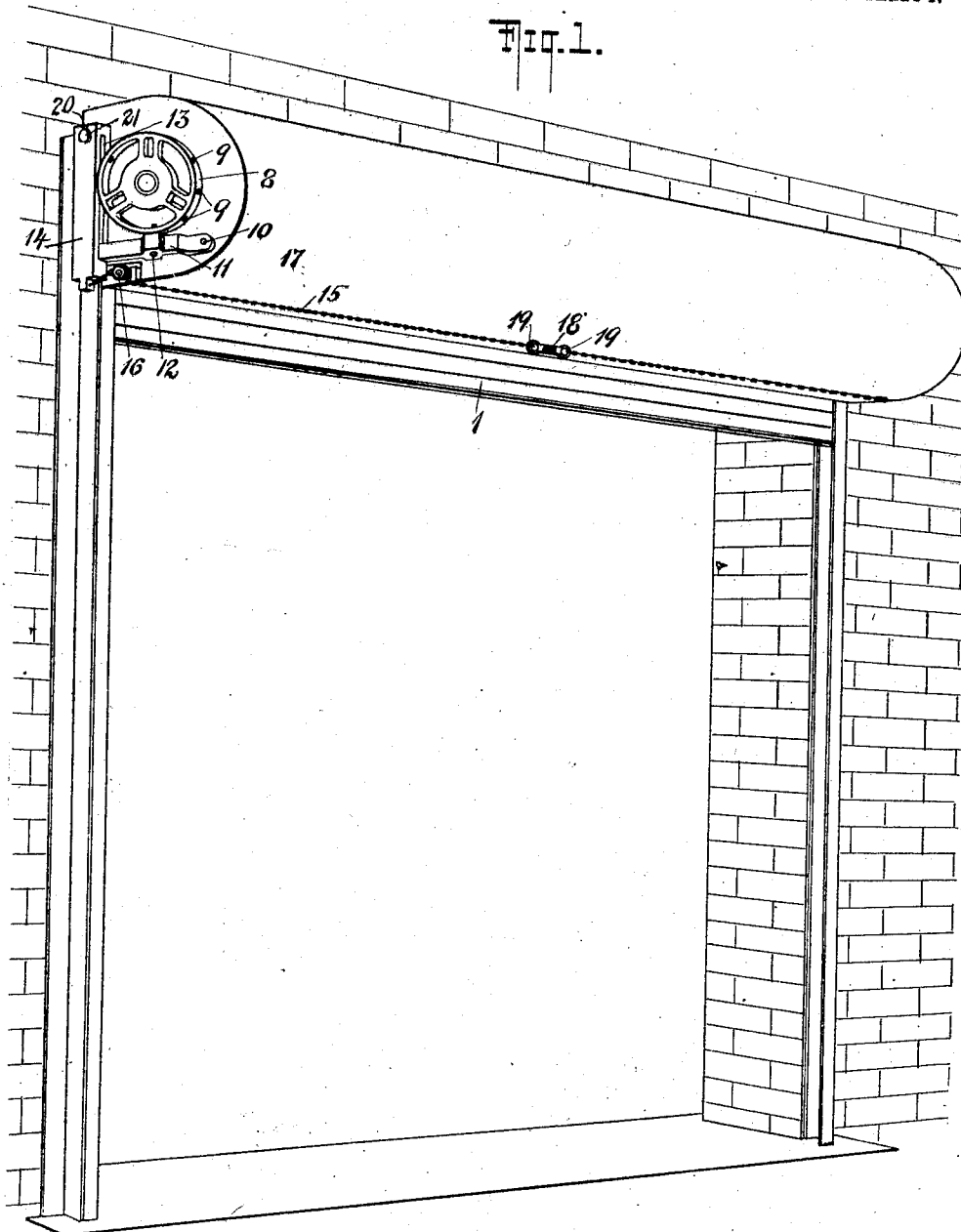


L. G. WILSON & F. McMANUS.
FIRE RESISTING SHUTTER.
APPLICATION FILED NOV. 30, 1908.

972,426.

Patented Oct. 11, 1910.
2 SHEETS-SHEET 1.

Fig. 1.



WITNESSES

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John Shilgum

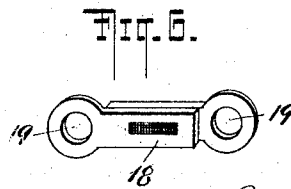
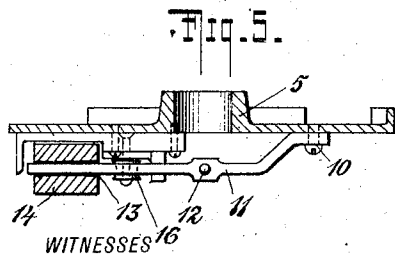
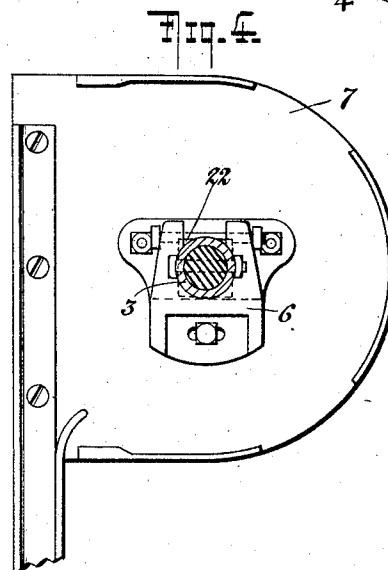
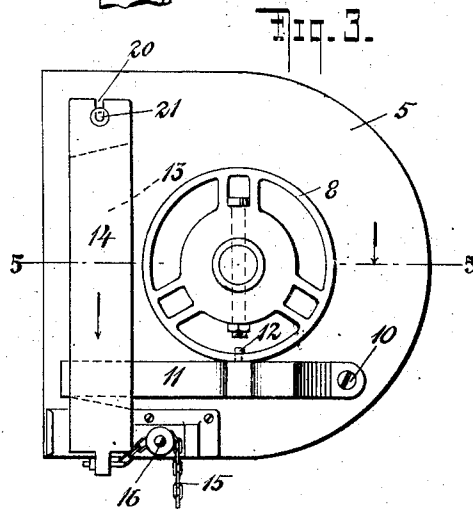
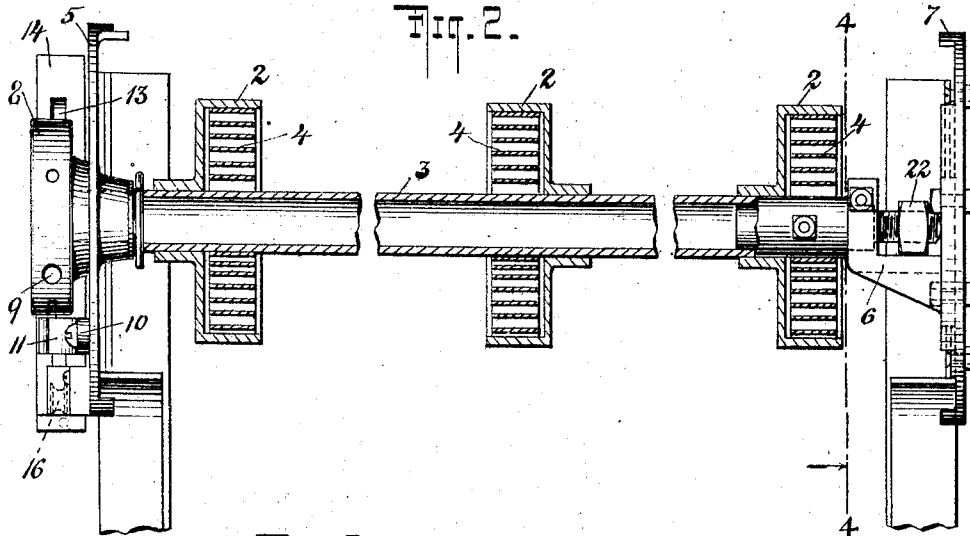
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

LESTER G. WILSON, OF LARCHMONT, NEW YORK, AND FRANK McMANUS, OF SOUTH NORFOLK, VIRGINIA; SAID McMANUS ASSIGNOR TO SAID WILSON.

FIRE-RESISTING SHUTTER

972,426.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed November 30, 1908. Serial No. 435,094.

To all whom it may concern:

Be it known that we, LESTER G. WILSON, a resident of Larchmont, Westchester county, State of New York, and FRANK McMANUS, a citizen of South Norfolk, Princess Anne county, State of Virginia, have jointly invented certain new and useful Improvements in Fire-Resisting Shutters, of which the following is a full, true, and exact specification.

Our invention relates to rolling shutters made of fire resisting material and adapted to automatically close over the opening that is to be protected whenever the temperature in the immediate vicinity of the shutter shall reach a definite and predetermined maximum.

Our invention has reference to automatic shutters of the counterbalanced type, in which the shutter may be normally opened or closed to any desired extent without interference with the automatic releasing device; and comprises certain special constructions and arrangements of parts as will more fully appear as the specification proceeds.

The object of our invention is to provide a means by which, in case of fire, the shutter may be released automatically, positively, and certainly, without risk of failure and without entailing damage to structural or functional parts of the curtain.

A further object is to enable the shutter to be quickly and easily reset in operative position without the aid of special tools or labor.

A further object of our invention is to enable the shutter to be set in operative position at practically any opening less than its full extent.

Still further objects of our invention will hereafter appear.

Referring to the drawings which show a preferred embodiment of our improved shutter, Figure 1 is a perspective view with the shutter in operative position. Fig. 2 is an axial elevation, part section, of the shutter roller and its mount. Fig. 3 is an end elevation of the shutter roller mount (viewed from the left of Fig. 2) showing the releasing device. Fig. 4 is an end elevation (taken from the right of Fig. 1) showing the "limit-stop". Fig. 5 is a plan, part section, taken from above and along the line 5-5 of Fig. 3; and Fig. 6 is a perspective view of the fusible link which controls the releasing device.

The shutter 1, which it has not been con-

sidered necessary to show save in Fig. 1, is attached at one end to and winds upon a series of barrels, 2, mounted upon a shaft 3, upon which they have free angular movement. Flat, coiled springs, 4, of suitable length are inclosed by each drum and have their ends attached respectively to the inner periphery of the drum and to the shaft; when the shutter is fully raised these springs are given, by independent rotation of the shaft, 3, in a suitable direction, a further uplifting tendency of any desired degree. They serve, therefore, as counterbalancing springs against which the shutter is always lowered and if the springs, 4, be suitably selected as to length and stiffness and the runways in which the curtain edges travel be properly fitted to such edges, the curtain will remain in any particular place in which it is put.

Shaft 3 is journaled at one end in a casing head 5, and at the other end in a lug, 6, forming a part of the other casing head, 7. Upon the shaft end outside of casing 5, is a pulley, 8, rigidly attached thereto and provided with radial holes, 9, uniformly spaced about its circumference. Pivoted at 10 is a flat lever, 11, provided with a pin, 12, adapted to engage any of the peripheral holes, 9. This bar at its outer end passes through a slot, 13, formed in the length of a weight bar 14.

Attached to the bottom of the weight bar is a chain, 15, which passes over a small idler pulley, 16, and thence around the corner of the housing, 17, passing beneath it to the opposite side of the shutter opening where it is fastened by any suitable means. At about the center of this chain is placed a fusible link, 18. This may be the ordinary fusible link of commerce consisting essentially of two thin, flat pieces of metal with their flats held together by solder of suitable melting point and with eyes, 19, for fastening the chain.

As shown in Fig. 1 the shutter is raised and supposed to be in operative position. If properly set the spring tension in springs 4 should be such as to assist in lifting the shutter no matter where it may be in its opening. As shown in the drawings, the curtain may be raised or lowered and will stay at any desired point. The weight bar, 14, has been raised by the chain, 15, to its topmost position in which it is steadied by the slot, 20, slipping over the pin 21.

If, for any reason, the temperature in the vicinity of the fusible link 18 should rise to the predetermined limit, the solder in this fuse will melt and the chain break apart. This will release the weight bar 14 which will instantly drop and knock away by its impact the pivoted bar, 11, thus freeing the pulley 8 from the pin 12. Shaft 3 will then fly around, thereby relaxing the springs 4, and the shutter, having now lost the uplift of the springs and having nothing but the friction of its edges in the grooves to sustain it, will instantly fall its full course from whatever position it may have had. Owing to the fact that the weight of the shutter becomes more and more effective as it unrolls it is clear that the shutter will fall, when released, with rapidly accelerated velocity and that some means for checking excessive speed and preventing the curtain from reaching its limit suddenly is required if permanent damage to the shutter and its mounting is to be avoided. We accomplish this very simply by the use of a square nut 22 threaded upon that end of the shaft 3 remote from the pulley 8. In the shutter illustrated, the thread must be a left hand thread; by suitably choosing the pitch of this thread and regulating the distance of the nut from the squared end of the shaft, we may cause the nut to be drawn up and screwed home against said squared end as the curtain nears the limit of its fall. For a part of the last revolution or so of the shaft, the nut will work very hard owing to its wedging effect with the shaft end so that the shaft will be slowed gradually but firmly and will finally stop without jar after which, further fall of the shutter will operate to wind up the springs, 4, thus bringing the shutter gently to rest.

In the absence of excessive temperature, *i. e.*, under normal conditions, the springs, 4, are, of course, always set; and the weight bar, 14, always in its uppermost position being held there by the chain, 15, and link 18. Under these circumstances the shutter operates as an ordinary counterbalanced shutter and may be raised or lowered or placed in any desired position.

After an emergency release, as just described, the shutter if small and light may usually be readily reset by first lifting it up to its full or any preferred limit and then grasping the pulley, 8, and rotating it until the springs, 4, have the desired tension; the bar 11 is then raised so as to engage pin, 12, with one of the pulley holes after which the weight bar may easily be lifted and the two

ends of the chain be brought together and fastened with a new link 18 or by resoldering the elements of the old link.

When the shutter is large and heavy it will generally be best to raise it and to wind up the springs at the same time, an operation which will usually require two people. To wind the springs a couple of short bars are inserted in the holes, 9, and used as hand-spikes, the bars being alternately removed and reinserted farther back as the pulley is turned. The lever, weight bar, chain, and link are then fixed as before.

We may make many alterations of mechanical detail in carrying out our invention without departing from its spirit or going outside its scope.

We are aware that counterbalanced fire resisting shutters have been hitherto made to fall automatically through the intermeditation of means fusible by excess of temperature and we do not broadly claim this idea, but only the embodiment and means which have been disclosed and which we particularly set forth in the following claim.

We claim—

In combination with a fire resistant shutter comprising a flexible fire resistant material fastened to and adapted to be coiled upon bands elastically secured to a shaft; a pulley at the end of said shaft provided with spaced peripheral recesses, a lever pivoted to the shutter casing provided with a pin to engage said recesses, a weight provided with an elongated slot surrounding the end of said lever, said weight being adapted to be raised or to fall so as to engage the lever with the bottom of said slot when in its upper position and with the top of said slot when in its lower position, means to prevent said weight from slipping off said lever, and means attached to the bottom of said weight for raising it to its topmost position, said raising means being adapted to be held taut by fusible means, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

LESTER G. WILSON.
FRANK McMANUS.

Witnesses as to Lester G. Wilson:

ELMER SHIRLYONN,
ERNST DOSCHER.

Witnesses as to Frank McManus:

T. Y. DAVIS,
H. E. D. WILSON.