April 16, 1929. E. H. McCLOUD ET AL 1,709,271

FIRE RESISTING CURTAIN

Filed Dec. 15, 1926 2 Sheets-Sheet 1

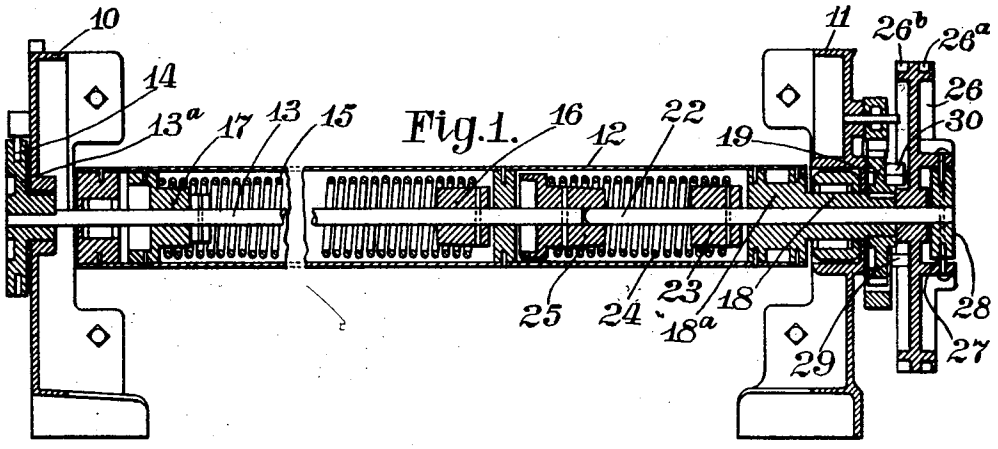


Fig.1.

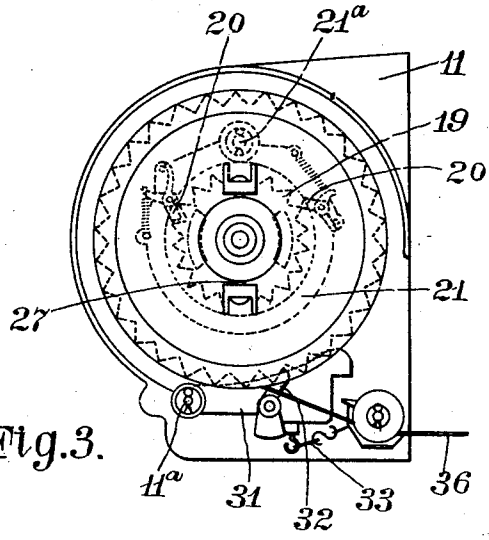


Fig.3.

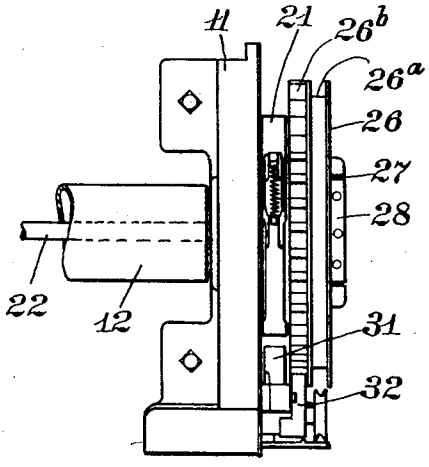


Fig.2.

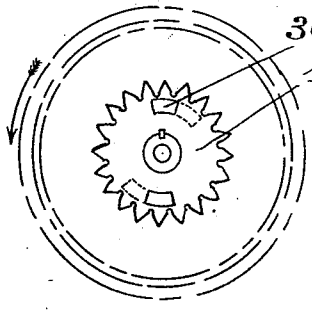


Fig.4.

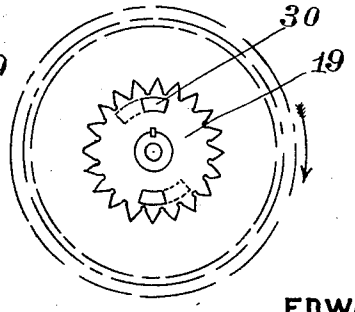


Fig.5.

Inventors
EDWARD H. McCLOUD
ALBERT RUSH
by Finnegan & Finnegan
their Attorneys

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FIRE RESISTING CURTAIN

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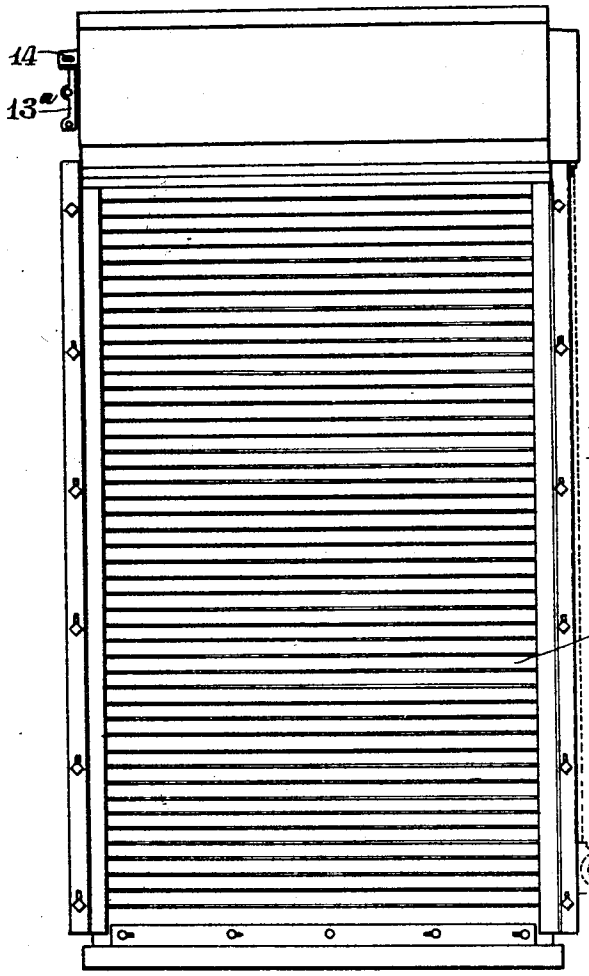


Fig.6.

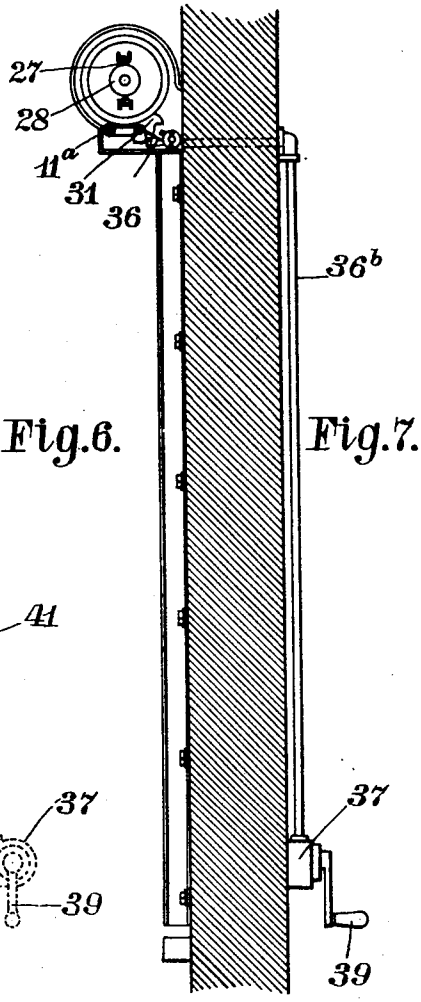


Fig.7.

Fig.8.

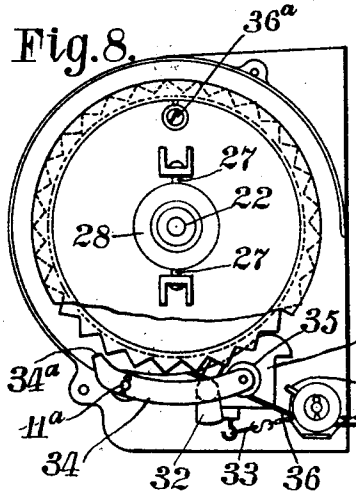
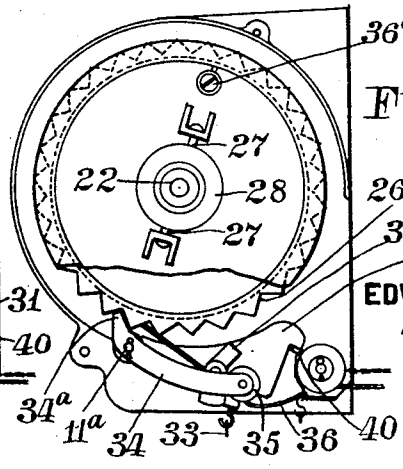


Fig.9.



Inventors
EDWARD H. McCLOUD
ALBERT RUSH
by Francis & Francis
their Attorneys

Patented Apr. 16, 1929. 1,709,271

UNITED STATES PATENT OFFICE.

EDWARD H. McCLOUD AND ALBERT RUSH, OF COLUMBUS, OHIO, ASSIGNORS TO THE KINNEAR MANUFACTURING COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF OHIO.

FIRE-RESISTING CURTAIN.

Application filed December 15, 1926. Serial No. 155,041.

This invention relates more especially to a fire resisting curtain that is kept normally wound up and is liberated upon the occurrence of fire.

The object of the invention is principally to provide first improved means for effecting the automatic closing of the curtain and second locking devices for the closing means. Other objects will appear from the disclosure herein.

The invention is embodied in the example herein shown and described the features of novelty being finally claimed.

In the accompanying drawings—

Figure 1 is a general view showing the curtain winding barrel in vertical longitudinal section broken out.

Fig. 2 is a front elevation of the right hand end of what is shown in Fig. 1.

Fig. 3 is an elevation of the right hand side of Fig. 2.

Figs. 4 and 5 show face views of the escapement braking or retarding wheel showing the position of the driving lug in the uncoiling and rewinding operations respectively.

Fig. 6 is a front view of the curtain closed.

Fig. 7 is a vertical section of a wall showing the right hand side of Fig. 6.

Fig. 8 is an end view showing the details of the locking devices in position to lock the curtain in coiled up position.

Fig. 9 is a similar view showing the locking devices released to fully lowered position.

In the views 10 and 11 are suitable left and right hand end brackets between which barrel 12 or coiling member on which the curtain designated 41 Fig. 6 is supported and coiled. 13 designates a shaft supported in the left hand bracket, said shaft having at its outer end an adjusting wheel 13^a provided with several sockets in its rim into any of which may be inserted a pin 14 extending through a lug fixed on the bracket for fixing the shaft in adjusted position. 15 designates a coil spring connected with the shaft at a collar 16 and with the barrel 12 through a collar 17 on the shaft. By adjusting the shaft 13 as before indicated the spring 15 can be twisted to yield the desired counterbalancing effect on the curtain.

The right hand end of the barrel 12 is supported in the end bracket 11 by means of a shaft extension 18 of a head or collar 18^a secured in the end of the barrel, said extension being supported in suitable roller bearings. The outer end of the shaft extension 18 has secured to it an escapement wheel 19 engaged by spring held dogs 20 supported on an oscillating frame 21 pivoted at 21^a, said mechanism becoming immediately effective upon the dropping of lever 31 and pawl 32 by the fusing of link 33, to prevent unduly rapid descent of the curtain when released. In the instance shown the wheel 19 rotates clockwise when the curtain unrolls. Such a retarding mechanism is shown in patent of the United States, No. 1,332,942, dated March 9, 1920, and its details need not be herein further described.

The shaft extension 18 and head 18^a have an axial bore through which a shaft 22 extends into the barrel. Said shaft 22 has connected to a collar 23 pinned on the shaft one end of a coil spring 24, the other end of said spring being connected to a collar 25 pinned on the inner end of the shaft 13. The function of the coil spring 24 is to impel the curtain to closed position as hereinafter noted. The outer end of the shaft 22 has loose on it a wheel 26 provided at its rim with a cable groove 26^a and a circumferential series of teeth 26^b. The wheel 26 is adjustable on the shaft 22 and can be fixed in adjusted position by means of pins 27 in lugs the exertion of the closing spring 24 on the pinned to the end of the shaft 22.

After the counterbalancing spring 15 has had its tension adjusted the tension of the curtain closing spring 24 can be adjusted by turning the collar 28 and shaft 22 in proper direction relative to the wheel 26, to store the spring with power to overcome the inertia of the curtain due to the fact that it is counterbalanced by the spring 15 when it has been properly adjusted for that purpose.

The wheel 26 is provided with a lug 29 and the escapement wheel with a lug 30 against which the lug 29 strikes and presses to turn the barrel in the curtain unwinding direction when the wheel 26 is released to permit the exertion of the closing spring 24 on the escapement wheel.

Pivoted on a pin 11^a on the end bracket 11 is a weighted lever 31 carrying a gravity pawl 32 adapted, when the lever 31 is in its

raised position, to engage one of the teeth 26^b and prevent the turning of the wheel 26 in the unwinding direction of the curtain and therefore the unrolling of the curtain. The lever 31 is held up in the position just described by means of a small chain containing a fusible link 33 attached to any suitable projection on the end bracket 11.

Pivoted on the pin 11^a is another lever 34 the forward end of which is a tooth or pawl 34^a, the other end of said lever carrying a grooved roller 35. Secured in the groove 26^a by means of screw 36^a is a cable 36 extending to the interior of the building and thence through a pipe 36^b to an ordinary winding drum in a case 37, said winding drum to be operated by a handled crank 39 within easy reach of the attendant. The cable 36 is passed under the grooved roller 35 and when the cable is taut it holds the tooth 34^a depressed from the path of the teeth 26^b. The lever 34 can be dispensed with as shown in Fig. 3. A lug 40 fixed on the end bracket arrests and limits the fall of the lever 31 upon its release. The wheel 26 and cable 36 can be termed the curtain recoiling means.

The operation is as follows: When the curtain is wound up and the parts set as shown in Fig. 8 the near presence of fire melts link 33, liberates the lever 31 thereby releasing the wheel 26 and permitting the closing spring 24 to exert its force to close the curtain. The parts are so adjusted and set that upon the release of the wheel 26 the lug 29 delivers a blow to the lug 30 thereby insuring the loosening of any sticking bearing due to rust, lack of lubricant or otherwise. After said blow the closing spring exerts a continuous pressure on the barrel to send the curtain to closed position.

During the automatic closing movement of the curtain the cord 36 is wound on the wheel 26, and the tooth 34^a ratchets on the teeth 26^b keeping the cable sufficiently slacked so that at the end of the operation the tooth drops into engagement with the teeth of the wheel locking the curtain in closed position as shown in Fig. 9 and preventing rebound of the curtain leaving it partly open.

The curtain is recoiled to normal or raised position by operating the handled crank 39 to unwind the cable 36, the parts being reset for further similar operation in case of fire. The rewinding of the cable takes up the slack referred to and operating on the roller 35 releases the pawl 34^a from the wheel 26.

The forms of the parts can be changed without departing from the gist of the invention as claimed.

What we claim is:

1. In a fire resisting rolling curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain for closing in case of fire, recoiling means for the curtain comprising a wheel connected with the coiling member and a cable attached thereto, a toothed rim moving with said wheel and a pawl controlled as to its position by the cable to engage and re-engage said toothed rim and by slackness thereof to prevent reverse motion of the curtain coiling member when the curtain is lowered.

2. In a fire resisting rolling curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain comprising a wheel connected with the coiling member and a cable attached to said wheel, a curtain closing spring actuating said wheel, a toothed rim moving with said wheel and a pawl controlled by slackness and tautness of the cable to engage said pawl with and release the same from said toothed rim.

3. In a fire resisting rolling curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain comprising a wheel connected with the coiling member and a cable attached to said wheel, a curtain closing spring actuating said curtain coiling member and wheel, a toothed rim moving with said wheel and a pawl controlled by slackness of the cable to engage said pawl with said toothed rim, a curtain retarding device connected with said curtain coiling member, and means on said wheel for engaging it with said retarding device when the thermally controlled means is actuated to release the curtain.

4. In a fire resisting rolling curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain comprising a wheel connected with the coiling member and a cable attached to said wheel, a curtain closing spring actuating said wheel, a curtain retarding device connected with the curtain coiling member, and means on said wheel for imparting a starting impact to said retarding device when the curtain is released in case of fire.

5. In a fire resisting curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain comprising a wheel and a cable attached to said wheel, a tension member for said wheel, and means on said wheel for delivering a starting impact to said coiling member when the curtain is released in case of fire.

6. In a fire resisting curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain comprising a wheel and a cable attached to said wheel, a tension curtain closing member connected with said wheel, means for regulating the tension of said tension member and means

on said wheel for delivering a starting impact to said coiling member when the curtain is released in case of fire.

7. In a fire resisting curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain, including a wheel and means for operating the same when the curtain is to be recoiled, a tension curtain closing member connected with said wheel, means for regulating the tension member, and means on said wheel for delivering a starting impact to said coiling member when the curtain is released in case of fire.

8. In a fire resisting curtain, the combination of a curtain coiling member, counterbalancing means for the curtain, thermally controlled means for releasing the curtain, recoiling means for the curtain including a wheel and a cable for turning the same, a tensioned curtain closing member connected with said wheel, means for regulating said tension member independently of the counterbalancing means, and means on said wheel for delivering a starting impact to said coiling member when the curtain is released in case of fire.

9. In fire resisting rolling curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain for closing in the event of fire, recoiling means for the curtain comprising a wheel connected with the coiling member and a cable attached thereto to wind up thereon when the curtain is lowered, a toothed rim moving with said wheel, a pawl for said toothed rim, said cable adapted, when taut, to hold said pawl disengaged from said toothed rim when the curtain unwinds and also by slackness thereof to permit the pawl to engage said toothed rim and thereby prevent reverse motion of the coiling member when the curtain is lowered.

10. In a fire resisting rolling curtain, the combination of a curtain coiling member, thermally controlled means for releasing the curtain, recoiling means for the curtain comprising a wheel connected with the coiling member, a curtain closing spring actuating said wheel, a cable attached to said wheel to be wound thereon when the curtain descends, a toothed rim moving with said wheel, and a pawl for said toothed rim, said cable adapted, when taut, to hold said pawl disengaged from said toothed rim when the curtain unwinds and also by slackness thereof to permit the pawl to engage said toothed rim and prevent reverse motion of the coiling member when the curtain is lowered.

EDWARD H. McCLOUD.
ALBERT RUSH.