Aug. 3, 1926. 1,594,819

G. E. DELLER

ROLLER SCREEN OPERATING MECHANISM

Filed June 11, 1925 2 Sheets-Sheet 1

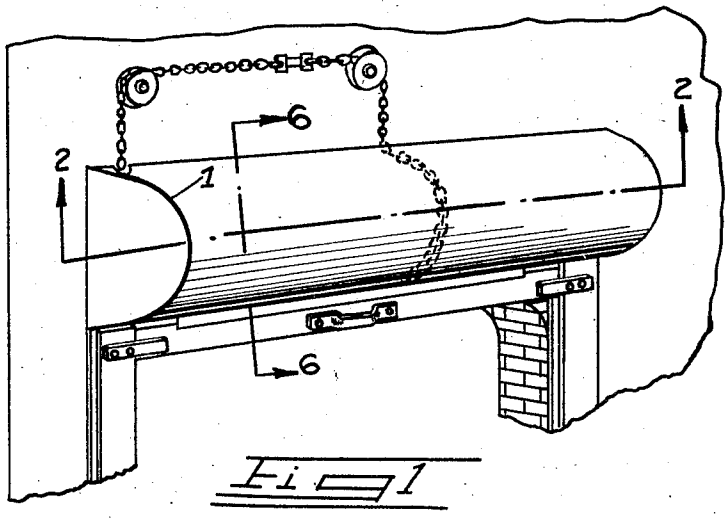


Fig 1

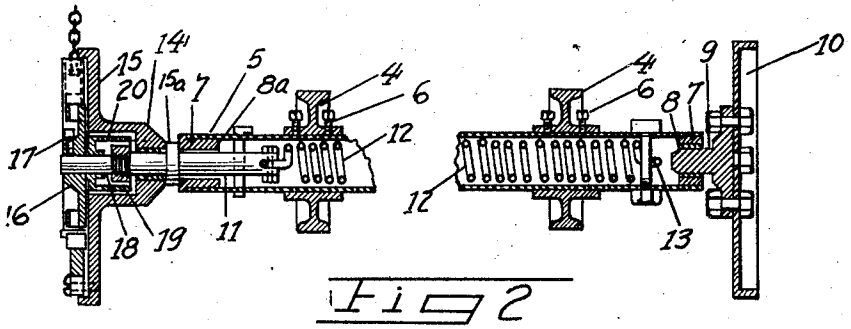


Fig 2

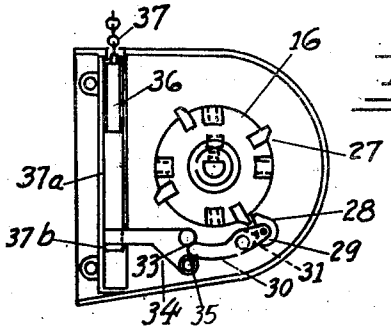


Fig 3

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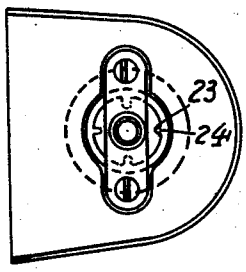


FIG 4

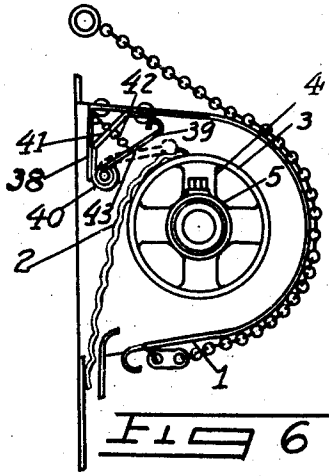


FIG 6

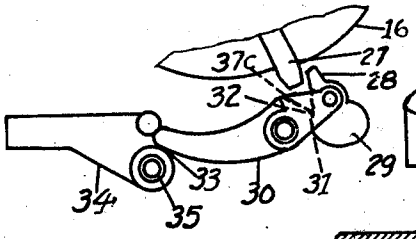


FIG 8

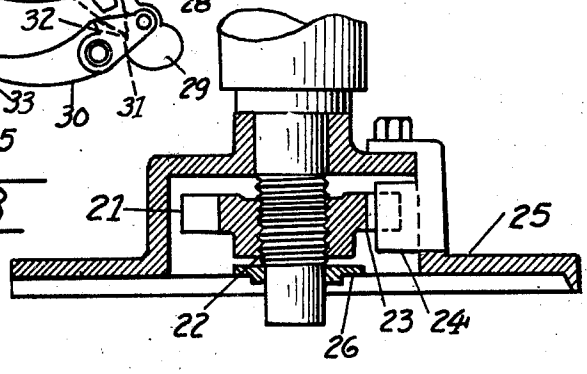


FIG 5

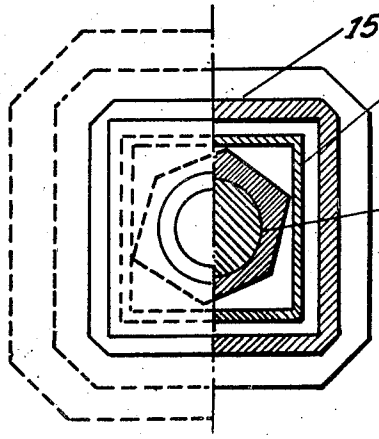


FIG 7

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Patented Aug. 3, 1926. 1,594,819

UNITED STATES PATENT OFFICE.

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ROLLER-SCREEN-OPERATING MECHANISM.

Application filed June 11, 1925. Serial No. 36,490.

My invention relates to operating mechanism for roller screens in general and particularly for fire doors in which a rolled fire screen is disposed in position to drop across an aperture such as a door with the melting, by the heat of a fire, of a fusible link.

Specifically it is the object of my invention to provide mechanism for releasing a rolled screen comprising screen roller wheel members on a roller mounted on a spindle, with a helical twist spring torsioned between the roller and the spindle, and to further dispose the spindle within a disc having lugs on its outer periphery adapted to act as a ratchet and engage a pawl element held in set position by a trigger member. Tripping mechanism actuated by the dropping of a weight suspended from a fusible link causes the screen to drop and the mechanism is so arranged that after the dropping of the screen, and the subsequent raising of the screen, and the rewinding of the disc, the resetting of the weight will automatically reset the trigger and tripping mechanism, without additional adjustment.

It is further my object to provide a check nut, mounted on the spindle, which will be accessible without the removal of the supporting bracket, and which will permit free movement of the screen at the start of its movement and which will not cause any lateral movement of the spindle with the consequent tendency to bind at the bearing portions.

With these and other objects hereinafter referred to I have provided a safe structure which will particularly adapt itself to simple and thorough testing in a minimum of time and with slight effort.

In the drawings:

Figure 1 is a perspective view of the outer casing of my novel roller screen mechanism within an outer cover.

Figure 2 is a section through the spring roller of the screen as indicated by the lines 2—2 in Figure 1.

Figure 3 is an end elevation of the preferred form of structure illustrated in Figure 2 with the outer cover on the operating side removed.

Figure 4 is an end elevation of a modification of the check nut structure illustrated in Figures 2 and 3.

Figure 5 is a section of the modification shown in Figure 4.

Figure 6 is a vertical section as indicated by the lines 6—6 in Figure 1 showing the structure of my novel flame stop.

Figure 7 is an enlarged detail end elevation illustrating the check nut and housing structure shown in Figures 3 and 4.

Figure 8 is an enlarged detail of the tripping mechanism shown in Figure 2.

Generally indicated at 1, Figures 1 and 6, is the outer cover for the rolled fire screen indicated at 2. The screen is preferably formed of articulated sections and rolled about the faces 3 of wheels 4, the hubs of which are mounted on a hollow pipe-like roller element 5 and secured thereto with suitable locking means such as the set screw 6. Bearing housings 7 are disposed within the ends of the pipe element 5 and bearings 8 and 8^a hold the pipe element with the wheels and the rolled screen on it in position within the cover at a suitable distance from the aperture for which the screen is provided. On the inoperative end of the pipe the bearing 8 encloses a stud-like shaft 9 which is suitably mounted in a bracket 10.

At the operating end of the structure the bearing 8^a provides a rotatable mounting for a spindle 11 the inner end of which is suitably secured to a helical twist spring 12. The other end of this spring 12 is secured through the side of the pipe 5 as shown at 13 so that the torsion of the spring is between the pipe with the screen rolled up on it and the spindle. The spindle is mounted in a bearing 14 which may conveniently be an extended part of the bracket 15 which is suitably secured to the walls adjacent the opening across which the screen is adapted to extend. A washer 15^a, fixedly mounted on the spindle is disposed between the bearing 14 and the housing 7. On the end of the spindle in the type illustrated in Figures 2, 3 and 7, the hub of a disc 16 is mounted with the set screws 17 extending from the hub against the spindle. Between

the portion of the spindle on which the disc is mounted and the portion extending through the bearing 14 the spindle is threaded as at 18 and a check nut 19 mounted on the spindle in the threaded portion is adapted, with the rotation of the spindle, to be held non-rotatively in a housing 20 which may be of any suitable hexagonal or squared shape. The nut 19 with the rotation of the spindle will move to a position frictionally engaging the inner walls of the bracket 15 and thus control the rotation of the spindle. The housing, which extends from the spindle, and is freely mounted on the spindle, and held in position by the disc, is shaped to conform on its outer side with a hollow portion of the bracket 15 as indicated in the detail elevation in Figure 7, so that the housing although not mounted on the bracket is retained in non-rotative position by the bracket.

The structure as hereinbefore described, as will be readily understood, operates as follows: When the disc is released and rotates it carries the spindle with it thereby releasing the roller member carrying the screen. The screen which is of sufficient weight to move downward across the opening as soon as the spring tension is released starts to move quickly. The check nut, at first, does not control the downward movement of the screen, but as soon as the spindle has moved a regulated distance the nut is brought into position of frictional engagement with a machined face of the bracket. The frictional engagement of the nut against the inner face of the bracket checks the rotation of the spindle and slows up the downward movement of the screen which moves from the position of engagement of the check nut with reverse torsion of the spring. The screen is thus prevented from dropping with sufficient force to cause damage. The spindle is not moved laterally with the release of the spring thereby avoiding a tendency to bind at the bearings.

The check nut structure shown in Figures 4 and 5 may be utilized where there is very limited clearance for adjusting the operating mechanism at the side of the spindle. It provides convenient mechanism for mounting either on the face of the wall or between door jambs. In this modification I provide a check nut 21 mounted in threads 22 on the spindle. The outer portion of the nut has grooves 23 in it and a slide and keeper element 24 secured to the bracket extends within the grooves. The element is adjustably secured to the bracket 25 which is suitably mounted on the wall, and is readily removable for adjustment of the check nut. A retaining plate 26, secured to the bracket, provides a thrust bearing which keeps the disc from lateral movement and as the disc is rigidly mounted on the spindle, lateral movement of the spindle with the release of the disc. is thereby prevented. The principle of operation of the check nut is consequently the same as is in the preferred mechanism indicated in Figures 2 and 3.

The outer periphery of the disc 16 is provided with extended lugs 27 at interspaced intervals in the periphery of the disc. These lugs are adapted to engage a pawl element 28 which is formed with an upwardly extended part and a weighted lower part 29. The pawl is pivotally mounted in a weighted rocker 30, which is extended with forked arms about the sides of the pawl. An obtuse angled face on the pawl, indicated at 31, is engaged by a pointed portion 32 of the rocker between the extended sides. The rocker is pivotally mounted on the bracket 15, and the end of the rocker opposite that on which the pawl is mounted is weighted and shaped to engage a grooved portion 33 in a trigger 34 pivotally mounted as shown at 35 and with a forward portion in the path of a weight 36 which is secured to a chain 37 on which the fusible link is mounted. A lifting hook 37^a is secured to the weight and extends underneath the contact end of the trigger 34 as indicated in Figure 3 at 37^b.

With the falling of the weight the trigger 34 rocks downwardly and moves the grooved portion away from engagement with the end of the rocker 30 which snaps upwardly due to the pawl element being engaged by a lug on the disc. The disc is under the spring tension of the spring within the roller and rotates as soon as the pawl is disengaged by the release of the rocker. With the rotation of the disc the curtain is released from the spring torsion and starts to unroll. After turning a regulated distance the check nut bears against the face of the bracket and thus retards the downward movement of the curtain.

In resetting the disc a handle may be provided with which to turn the disc in reverse direction. As shown in Figures 3 and 8 the rewinding turns the disc 16 with the lugs 27 extending out from its periphery in a clockwise direction. As each lug 27 engages the pawl 28, the pawl rocks down into a recess 37^c between the forked rocker arms 30 allowing the lug to pass. When the screen is rewound and it is desired to reset the trigger 34 the weight 36 is elevated. The hook 37^b being also elevated with the weight engages the under side of the trigger 34 and moves the grooved portion 33 of the trigger into engaging position with the end of the rocker 30. The end of the rocker 30 being weighted normally bears against the pivotal bearing portion 35 of the trigger and only tilts upwardly in a clockwise direction

when a lug 27 is passing the pawl 28. Whether the rocker 30 is in set or released position the lugs 27 will always be free to tilt the pawl 28 counterclockwise so that the screen may be rewound either with the trigger set or released. It is only with the trigger released, however, that the disc will be free to move in a counterclockwise direction. Thus it will be observed that the rewind mechanism and the resetting mechanism are independent each of the other, it being possible to carry out either operation without regard to the other excepting, of course, that it is necessary to reset the trigger by resuspending the weight at some period prior to the release of the rewinding mechanism

The flame stop illustrated in Figure 6 is composed of a fixed apron 38 with a hinged apron 39 articulated to the fixed apron as shown at 40. Braces 41 may conveniently be disposed on the hood or cover and extended down to the fixed part to secure it firmly in position. The hinged part has a chain 42 which holds the hinged part out of the way of the curtain excepting when a fusible link 43 is melted, allowing the apron to drop down onto the screen to prevent the passage of flames through the opening in the cover between the cover and the screen roll. The obvious advantage of my flame stop is that it permits a complete closure for the opening between the cover and the screen, with a construction which is adapted to avoid bending the hinged portion of the stop, and to avoid the likelihood of the flame stop blocking the lifting of the screen. This avoids the tendency of a fire door dropping and becoming blocked so as to prevent its being lifted to provide an exit from the building.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In combination with a rolled screen element, a hub element on which said screen may be rolled, a spring element adapted to engage said hub element, a spindle element, with the spring element tensioned between said hub element and said spindle element, a ratchet element disposed on said spindle element, a trigger, a weight suspended in position to engage said trigger, a fusible link in the suspension element for said weight, a rocker element carrying a pawl, said rocker element balanced so as to remain normally in position to be engaged by said trigger, said pawl pivotally mounted on said rocker element, and said rocker element adapted with the release of said trigger to rock in one direction only as actuated by the tension of said ratchet element against said pawl which is carried by said rocker.

2. In combination with a rolled screen element, a hub element on which said screen may be rolled, a spring element adapted to engage said hub element, a spindle element, with the spring element tensioned between said hub element and said spindle element, a ratchet element disposed on said spindle element, a trigger, a weight suspended in position to engage said trigger, a fusible link in the suspension element for said weight, a rocker element carrying a pawl, said rocker element balanced so as to remain normally in position to be engaged by said trigger, said pawl pivotally mounted on said rocker element, and said rocker element adapted with the release of said trigger to rock in one direction only, as actuated by the tension of said ratchet element against said pawl which is carried by said rocker, and said trigger element in set position adapted to inhibit the rocking of said rocker.

3. In combination with a rolled screen element, a hub element on which said screen may be rolled, a spring element adapted to engage said hub element, a spindle element, with the spring element tensioned between said hub element and said spindle element, a ratchet element disposed on said spindle element, a trigger, a weight suspended in position to engage said trigger, a fusible link in the suspension element for said weight, a rocker element carrying a pawl, said rocker element balanced so as to remain normally in position to be engaged by said trigger, said pawl pivotally mounted on said rocker element, and said rocker element adapted with the release of said trigger to rock in one direction only, as actuated by the tension of said ratchet element against said pawl which is carried by said rocker, and said trigger element in set position adapted to inhibit the rocking of said rocker and said weight provided with means for resetting said trigger.

4. In combination with mechanism for actuating a rolled screen on a mounting member, mechanism for resetting the mounting member comprising a rocker carrying a pawl element, a ratchet element engaged by said pawl, a fusible linked weight, a trigger member disposed in the path of said weight, said trigger member operatively connected with said rocker, and said weight provided with means for resetting said trigger.

5. In combination with mechanism for actuating a rolled screen on a mounting member, a cover for enclosing the mechanism comprising a fixed apron and an articulated apron, an aperture between the cover and said mechanism, the fixed apron extending down thereacross but not closing the aperture and the articulated apron pivotally mounted in the fixed apron so as to swing in the same direction as the said

screen moves during the re-rolling operation, and a fusible link adapted to release the articulated apron to complete the air closing seal of the aperture.

6. In a device of the character specified, a rolled screen, supporting members for the screen, a spindle, a spring torsioned between the rolled screen and the spindle, tripping mechanism for releasing the spindle and a check nut mounted on the spindle and adapted to bear frictionally against a supporting member and means held in non-rotative position by the supporting members for inhibiting the rotation of the check nut, said means adjustably removable.

7. In a device of the character specified, a rolled screen, supporting members for the screen, a spindle, a spring torsioned between the rolled screen and the spindle, tripping mechanism for releasing the spindle, a suspended weight adapted to drop and release the tripping mechanism and means secured to the weight for resetting the tripping mechanism.

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