Aug. 23, 1932. U. TAUCHER 1,873,161

DUST BARRIER

Filed Sept. 20, 1930 4 Sheets-Sheet 1

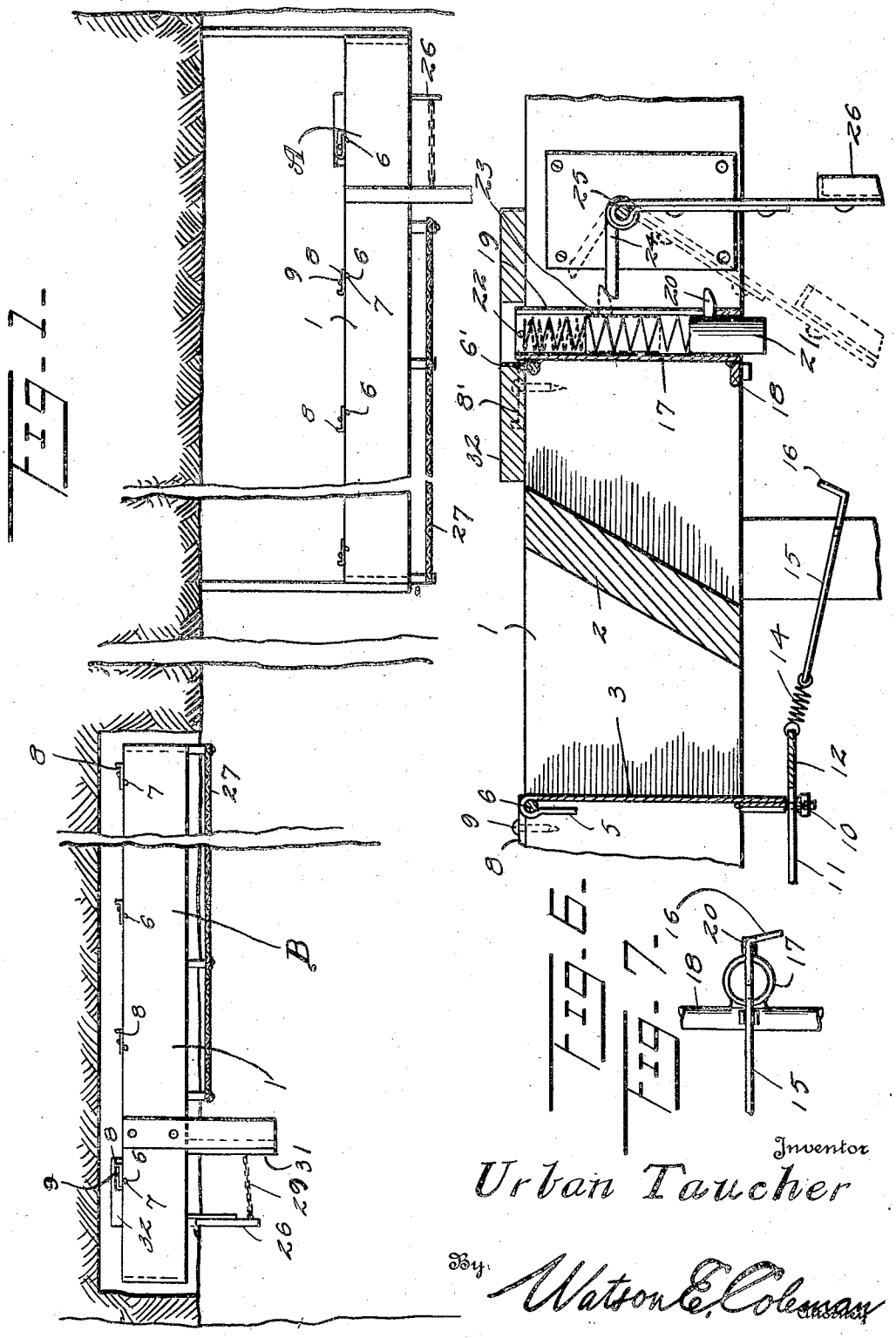


Fig. 1.

Fig. 6.

Fig. 7.

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DUST BARRIER

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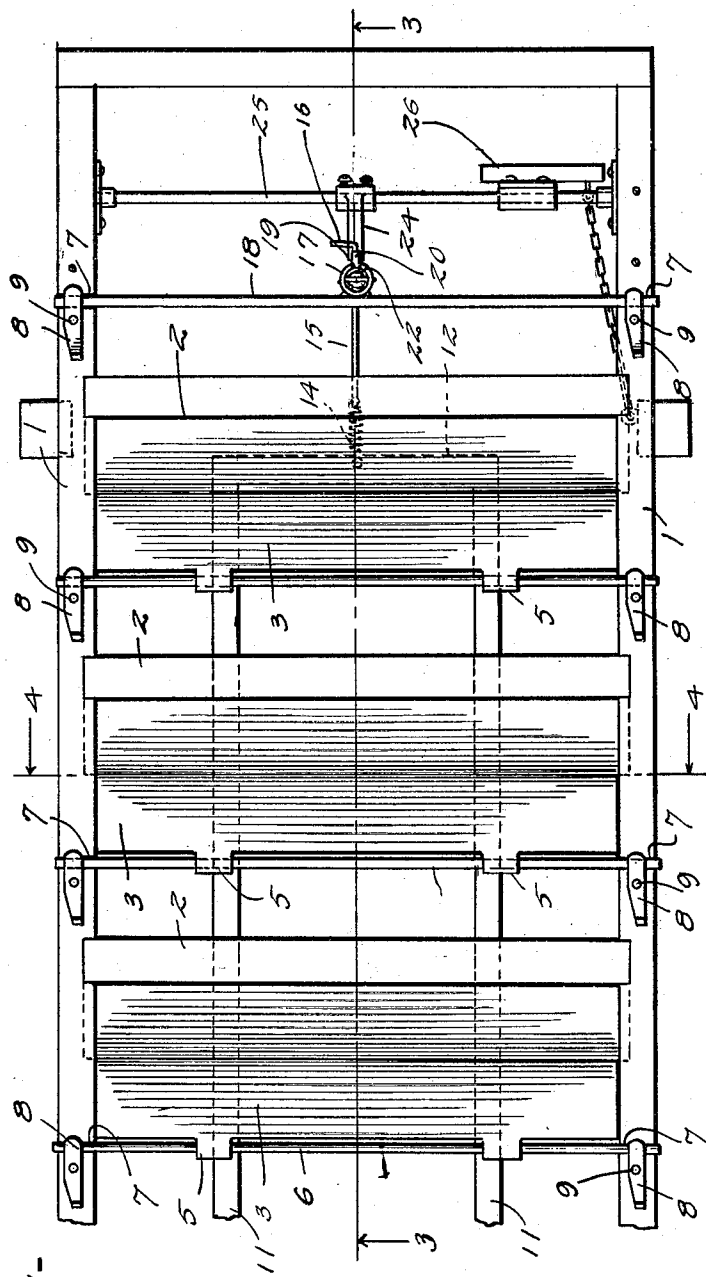


FIG. 2.

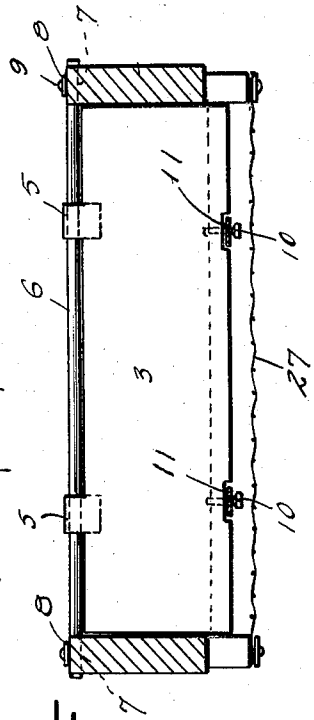


FIG. 4.

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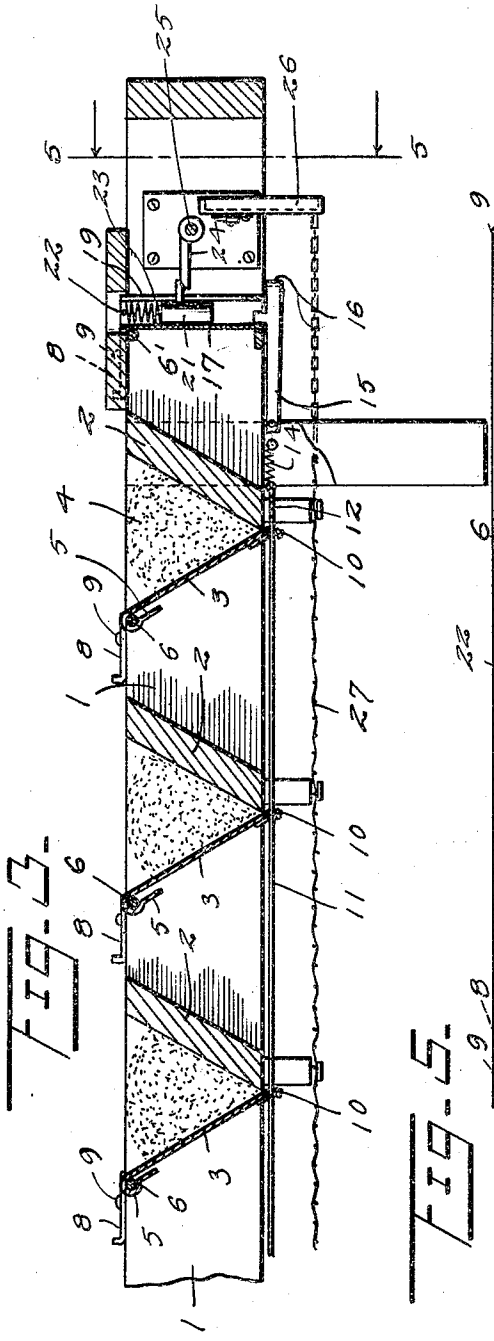


FIG. 3.

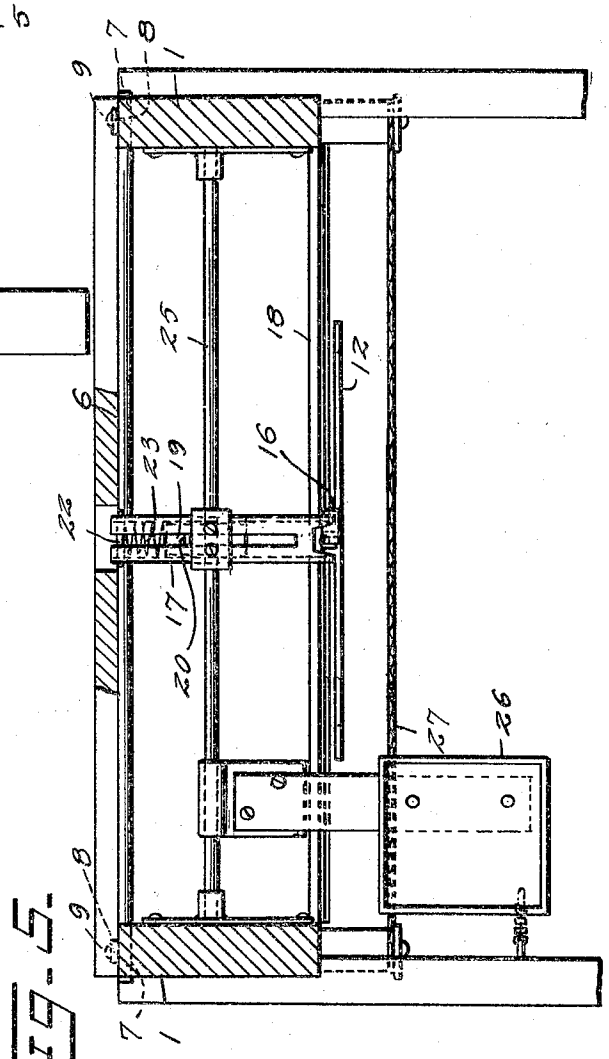


FIG. 5.

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DUST BARRIER

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Fig. 8.

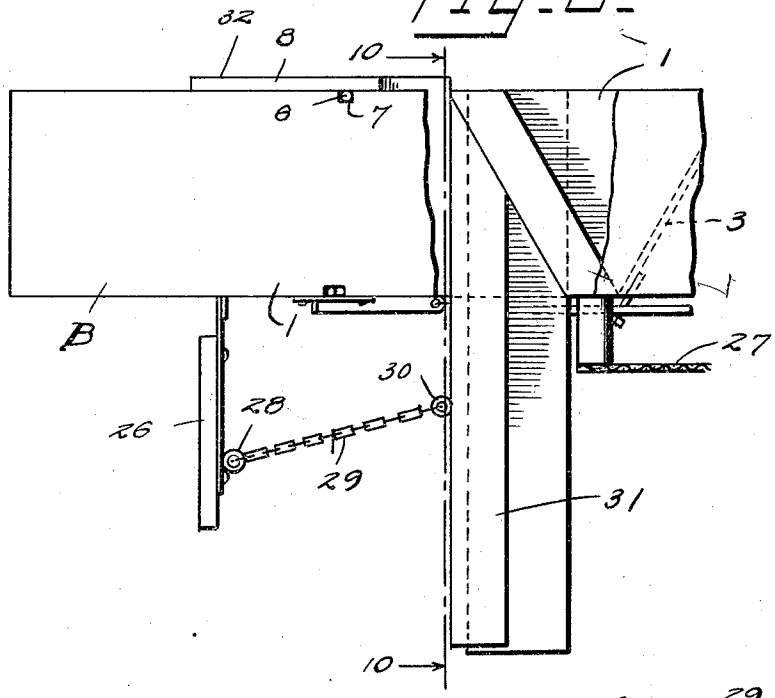
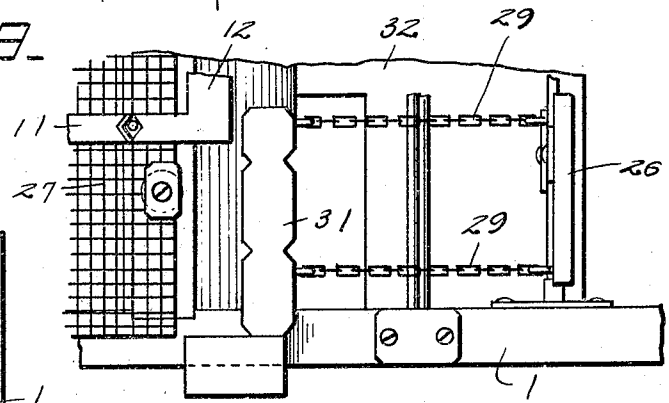


Fig. 9.



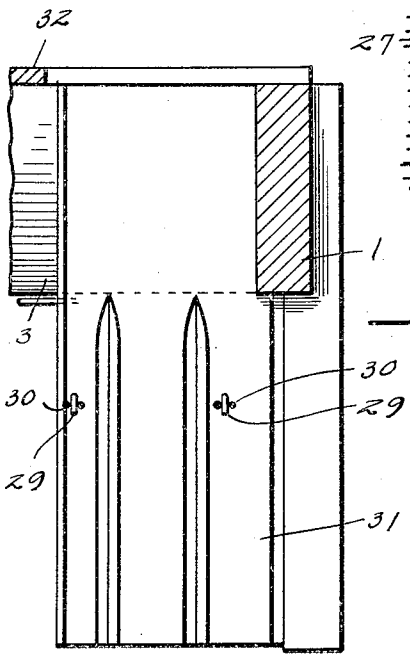


Fig. 10.

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UNITED STATES PATENT OFFICE

URBAN TAUCHER, OF ROCK SPRINGS, WYOMING

DUST BARRIER

Application filed September 20, 1930. Serial No. 483,364.

This invention relates to a dust barrier and it is an object of the invention to provide a device of this kind adapted for use within a mine and which operates automatically to create a dust cloud to prevent the propagation of an explosion.

The invention also has for an object to provide an apparatus of this kind which automatically becomes effective upon an explosion within a mine passage and which apparatus when effective creates a cloud of dust of shale or other inert material to prevent propagation of such explosion.

An additional object of the invention is to provide an apparatus of this kind including a plurality of suitably positioned receptacles containing a supply of inert dust, such as shale, together with means associated with said receptacles operating automatically as a result of an explosion to release said dust.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved dust barrier whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawing, wherein:—

Figure 1 is a view in side elevation and of somewhat a diagrammatic character illustrating barriers constructed in accordance with an embodiment of my invention in applied position;

Figure 2 is a fragmentary view in top plan of one of the devices as herein disclosed;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 2;

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 2;

Figure 6 is an enlarged fragmentary sectional view taken on the same line as 3—3;

Figure 7 is a fragmentary view in bottom plan of the cylinder and parts directly associated therewith.

Figure 8 is an enlarged fragmentary elevational view taken at one end portion of one of the apparatus, as herein disclosed;

Figure 9 is a fragmentary view at top plan of the structure illustrated in Figure 8;

Figure 10 is a sectional view taken substantially on the line 10—10 of Figure 8.

As illustrated in Figure 1, two apparatus A and B constructed in accordance with an embodiment of my invention are suitably positioned within the passageway of a mine, the apparatus B being termed what is known as a "repeater" and is positioned preferably at a point within the passageway higher than that of the apparatus A.

These two apparatus are duplicate in construction but reversely arranged, the apparatus B intending to become effective in the event of a second explosion or flare-back. Each of the apparatus A and B is of any preferred dimensions and includes as many dust receptacles as the requirements of practice may dictate.

As disclosed in the accompanying drawings, each of the apparatus A and B comprises side members 1 which, at predetermined points spaced longitudinally thereof, are connected by the cross members 2 each disposed on a lateral incline with respect to the vertical or the plane occupied by the side members 1. Each of these cross members 2 constitutes a wall for a dust receptacle and coacting with each of these cross members or walls 2 is a swinging wall 3 which, when closed with respect to the member or wall 2, is inclined upwardly from the lower end of the member or wall 2 in a direction therefrom. With the wall 3 closed a receptacle is provided adapted to contain a supply of suitable inert dust, such as shale dust.

The upper marginal portion of each of the walls or plates 3 is provided with hook-like members 5 whereby the same may be pivotally suspended from a cross bar or rod 6 bridging the space between the side members 1 and resting thereon from above. The upper

surfaces of the members 1 are provided with transversely disposed grooves or channels 7 which receive the end portions of the bars or rods 6. Coacting with such end portions of the rods or bars 6 are the retaining or holding latches 8 herein disclosed as pivotally connected intermediate their ends, as at 9, to the upper edge face of the side members 1.

The lower longitudinal margins of all of the walls or plate 3 are operatively connected, as at 10, with the transversely spaced parallel bars 11, said bars being connected by an end cross members 12. Substantially midway its ends the cross member 12 has secured thereto an extremity of a coil spring 14 of desired tension, the opposite end portion of which being operatively connected to an end portion of an elongated arm 15.

The end portion of the arm 15 remote from the end member 12 terminates in a lateral extension or lip 16 which, when the walls 3 are in their closed or normal positions, is inserted from below up within a holding cylinder 17. This cylinder 17 is operatively supported by a lower cross member 18 suitably secured to the side members 1 and also by an upper bar 6′ operatively engaged with the side members 1 in the same manner as each of the bars 6 hereinbefore referred to and which bar 6′ is held in applied position by the swinging latches 8′.

The wall of the cylinder 17 is provided therealong with a groove or slot 19 through which projects a lug 20 carried by a plunger 21 slidably placed within the cylinder 17. The upper end of the cylinder 17 is provided with a cross bar 22 and interposed between this bar 22 and the inner end of the plunger 21 is an expansible member 23 of desired tension and which is herein disclosed as a coil spring.

When the plunger 21 is retracted within the cylinder 17, the member or spring 23 is placed under tension and the plunger 21 is maintained in such retracted position by a rock arm or trigger 24 engaging the lug 20 from below. This rock arm or trigger 24 is carried by a shaft 25 rotatably supported between the side members 1.

The shaft 25 also carries a depending wing 26 which, under the force of an explosion, will swing in a direction to release the trigger 24 from the lug 20 whereupon the plunger 21 will be forced downwardly for contact with the extension or lip 16 free of the cylinder 17 whereupon the weight of the dust within each of the receptacles will swing the wall 3 of such receptacle into open position to permit release of the dust therein.

As the dust drops it passes through a screen fabric 27 underlying the various receptacles and which serves to assure an effective distribution of the dust to create a cloud which will resist propagation of an explosion.

The repeater apparatus B, as before stated, is positioned above or higher than the apparatus A and the apparatus B is intended to be effective upon a second explosion or flare-back or return of the force of the first explosion. By the use of the two apparatus the force of the explosion is caught on both sides, that is to say, going up the passage and coming back.

Each of the wings 26 has connected thereto as at 28 the extremity of a flexible member or chain 29 which is also secured as at 30 to the member 31 depending from the apparatus. These chains or flexible members 29 coacting with the wing 26 in the apparatus B are two in number, while in connection with the wing 26 in the apparatus, only one is used, and provide effective means for limiting the movement of the ring 26 in one direction beyond substantially the vertical.

I also find it of advantage to place upon the side members 1 boards 32 which provide effective means to protect the locking or latching mechanism from falling stone cold or the like.

From the foregoing description it is thought to be obvious that a dust barrier constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

1. A dust barrier apparatus comprising a dust receptacle having a movable wall movable into dust releasing position, a member operatively engaged with the movable wall and engaging the cylinder to hold the movable wall in closed position, a plunger working within the cylinder, means for holding the plunger retracted, said holding means including means operating under force of an explosion in one direction to release the plunger and preventing release of the plunger under force of an explosion in the opposite direction, the plunger when released disengaging the member from the cylinder, and means for normally urging said plunger toward said member.

2. A dust barrier apparatus comprising a dust receptacle having a movable wall movable into dust releasing position, a member operatively engaged with the wall and engaging the cylinder to hold the movable wall in closed position, a plunger working within the cylinder, means for holding the plunger retracted, means for normally urging said plunger toward said member, said holding means including a shaft, a trigger

carried by the shaft and coacting with the plunger for holding the same retracted, an operating wing carried by the shaft, and means for holding said operating wing against movement in one direction, movement of the wing in the opposite direction effecting release of said holding means, release of said holding means permitting movement of the plunger toward the member to release the member from the cylinder.

In testimony whereof I hereunto affix my signature.

URBAN TAUCHER.