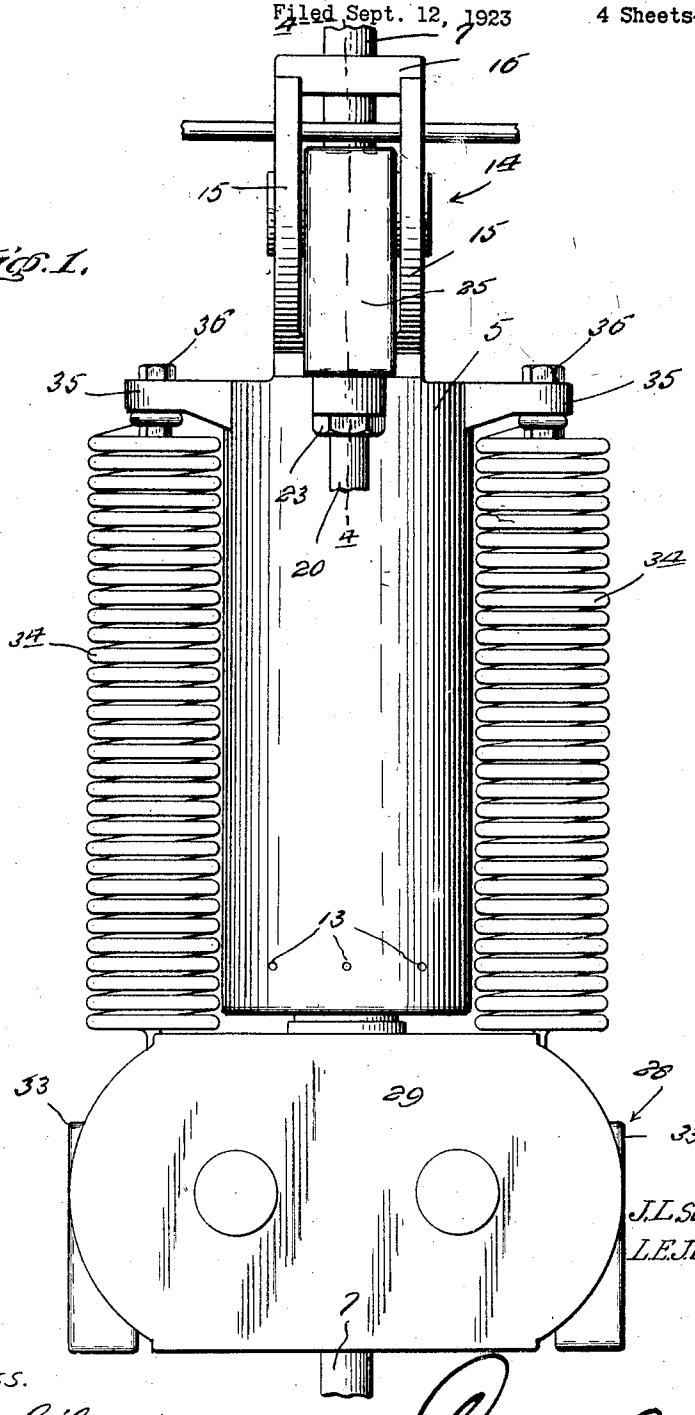
March 10, 1925. 1,528,857

J. L. STRANDBERG ET AL

PNEUMATIC JACK

Filed Sept. 12, 1923 4 Sheets-Sheet 1

Fig. 1.



J. L. Strandberg and L. E. J. Blomberg. Inventor

Witness.
H. C. Gibson.

By Clarence A. O'Brien Attorney

March 10, 1925. 1,528,857

J. L. STRANDBERG ET AL

PNEUMATIC JACK

Filed Sept. 12, 1923 4 Sheets-Sheet 2

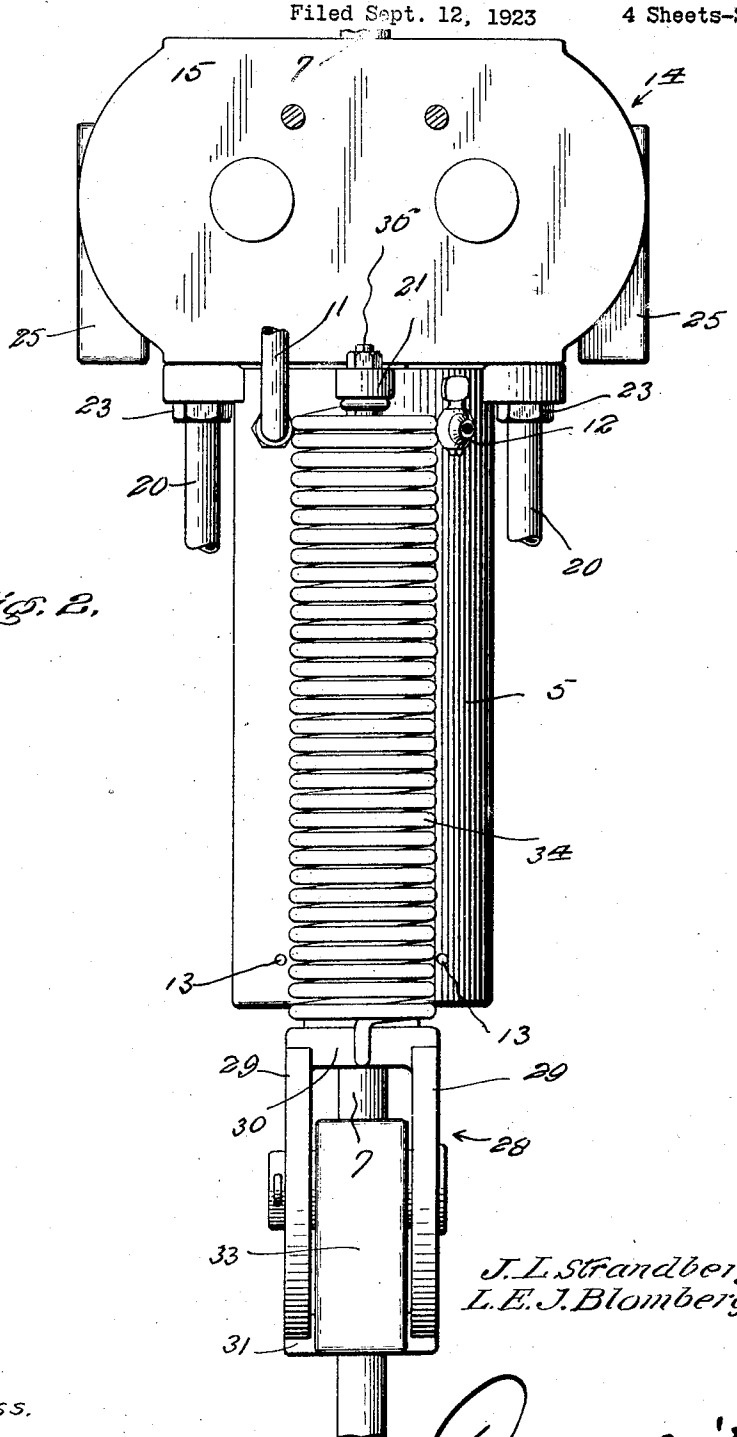


Fig. 2.

J. L. Strandberg and L. E. J. Blomberg, Inventor

Witness.
F. C. Gibson.

By Owen O'Brien
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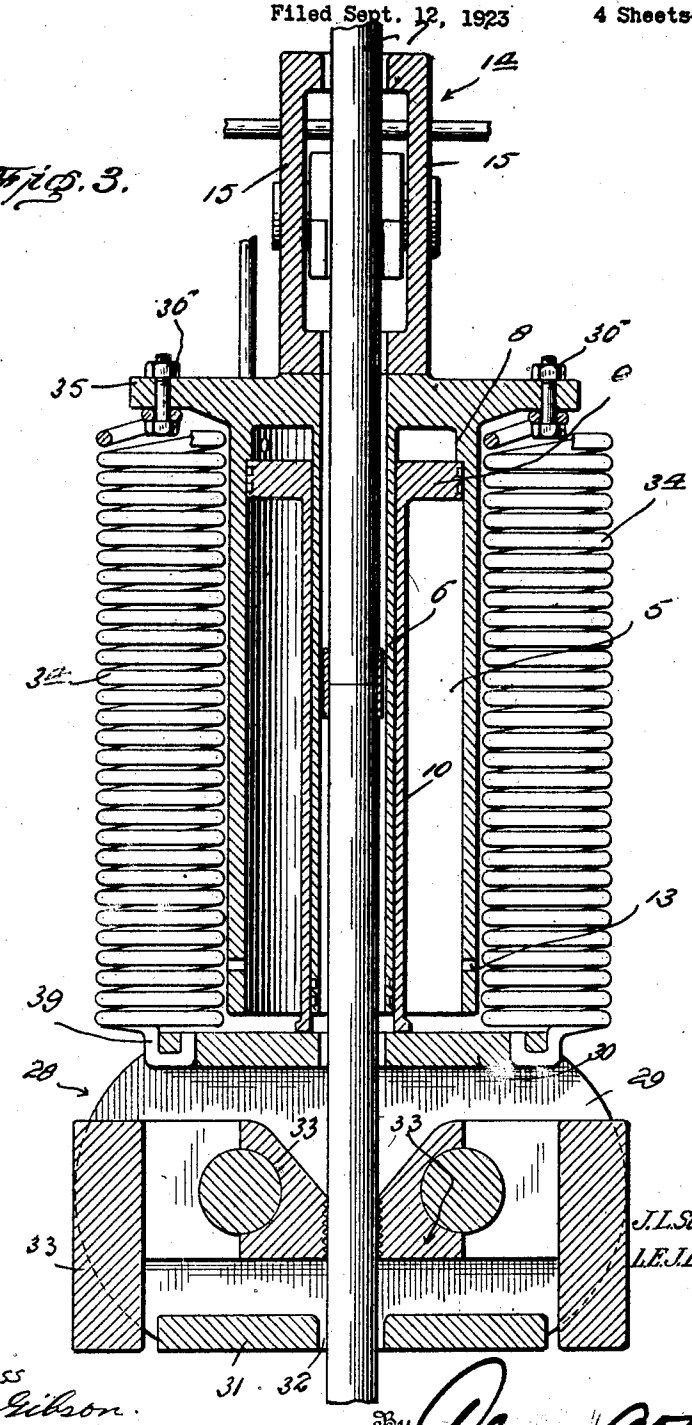
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J. L. STRANDBERG ET AL.

PNEUMATIC JACK

Filed Sept. 12, 1923 4 Sheets-Sheet 3

Fig. 3.



J. L. Strandberg and L. E. J. Blomberg. Inventor

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March 10, 1925. 1,528,857

J. L. STRANDBERG ET AL

PNEUMATIC JACK

Filed Sept. 12, 1923 4 Sheets-Sheet 4

Fig. 4.

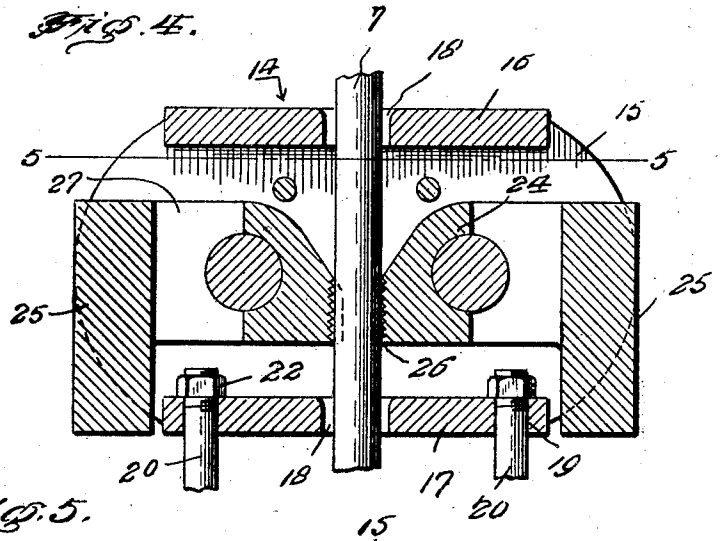


Fig. 5.

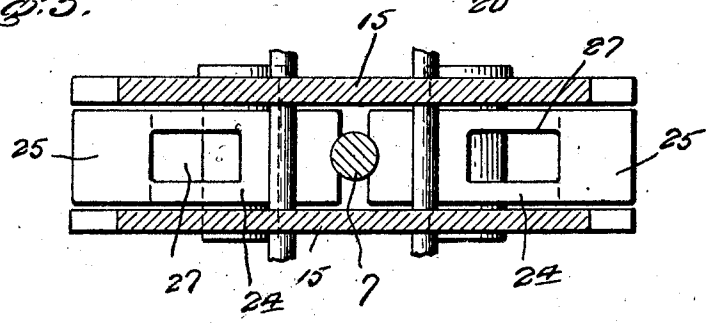


Fig. 6.

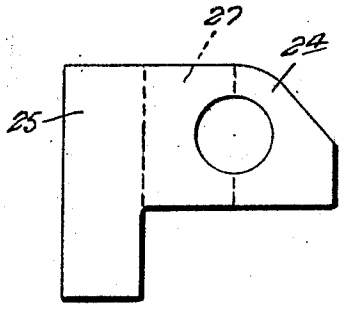
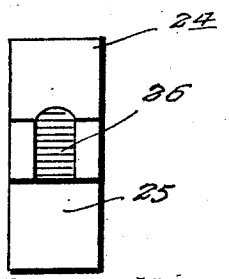


Fig. 7.



J. L. Strandberg and
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By Marion & O'Brien
Attorney

Patented Mar. 10, 1925. 1,528,857

UNITED STATES PATENT OFFICE.

JOHN L. STRANDBERG AND LARS E. J. BLOMBERG, OF KANSAS CITY, MISSOURI.

PNEUMATIC JACK.

Application filed September 12, 1923. Serial No. 662,179.

To all whom it may concern:

Be it known that we, JOHN L. STRANDBERG and LARS E. J. BLOMBERG, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Pneumatic Jacks, of which the following is a specification.

In carrying out the present invention it is our purpose to provide a pneumatic jack for use primarily in conjunction with the slow raising of movable concrete forms that is a substantial improvement over the pneumatic jack shown and described in our co-pending application filed July 21st, 1923, and bearing Serial Number 652,961.

In this co-pending application there is set forth a pneumatic jack for use in the slow raising of movable concrete forms that includes a cylinder within which is rectilinearly movable a piston adapted to be forced downwardly within the cylinder by air pressure. This cylinder is operatively connected to the concrete form to be slowly raised and moved upwardly upon a climbing rod when air is injected into said cylinder. The piston during the upstroke of the cylinder is adapted to be operatively connected to said climbing rod for preventing the downstroke of the piston upon the climbing rod. After the concrete form has been raised to the limit of movement of the jack the cylinder itself is operatively connected mechanically to said climbing rod and the piston released mechanically therefrom and forced mechanically up upon said rod and within the upper end of the cylinder whereby the operation of the jack may be repeated.

The primary object of this, our present invention, is to provide such a pneumatic jack wherein automatic means is provided for the connecting and disconnecting of the cylinder to and from said rod, together with automatic means for connecting and disconnecting said piston to and from said rod as well as means for automatically returning the piston to its initial position within the cylinder for allowing the operation of the jack to be repeated.

An additional object of this invention is to provide such a pneumatic jack that includes these automatic features wherein the same may be manufactured and operated at a cost but slightly greater than the type of jack set forth in the above mentioned co-pending application.

Yet another object is the provision of such a device wherein the parts may be readily disassembled for repair or renewal purposes, the device embracing at the same time the desired features of efficiency of operation and durability of construction.

With the above and other objects in view as the nature of the invention is better understood, the same comprises the novel form, combination and arrangement of parts set forth in the following detailed specification, shown in the accompanying drawings and claimed.

In the drawings wherein like reference characters indicate corresponding parts throughout the several views,

Figure 1 is an elevational view of one side of our improved jack, the elements thereof in their normal inoperative positions,

Figure 2 is a front elevational view thereof,

Figure 3 is a detailed vertical cross section of our improved jack, the parts also being shown in their normal inoperative positions,

Figure 4 is a detailed vertical section taken substantially upon the line 4—4 of Figure 1, for more clearly disclosing the upper clamp element of our improved jack,

Figure 5 is a longitudinal section of this clamp element taken substantially upon the line 5—5 of Figure 4,

Figure 6 is a side elevational view of one of the clamping jaws per se employed in conjunction with the upper and lower clamp elements of our pneumatic jack, and

Figure 7 is an elevational view of one end thereof.

With specific reference to the drawings, our improved pneumatic jack comprises a relatively large cylinder 5 opened at its lower end and formed centrally with an open ended tube 6 through which is freely movable the well known climbing rod 7 that is employed in conjunction with jacks specifically used in the slow raising of movable concrete forms. The interior of this cylinder 5 is formed adjacent its upper end with a shoulder 8 for limiting the upward sliding movement of a piston 9 that is formed upon the upper end of a hollow rod 10 disposed for sliding movement upon the before mentioned open ended tube 6 formed centrally within said cylinder 5. In communication with the upper end of this cylinder 5 is a compressed air inlet pipe 11, that has communication at its opposite end

with a suitable source of compressed air supply, the upper end of this cylinder being also equipped with an exhaust valve in the form of a pet cock 12 that may be regulated for controlling the exhaust of the air from the cylinder during the upstroke of the piston in a manner hereinafter set forth. Adjacent the lower end of this cylinder, the same is equipped with discharge openings 13 whereby when the same are uncovered by the piston 9 on its downstroke the air will be permitted to discharge from the cylinder and consequently prevent said piston 9 from being totally discharged therefrom.

Upon the upper closed end of said cylinder 5 is an automatically operating climbing rod clamp designated generally 14 which clamp comprises a casing including side walls 15 inter-connected at their upper and lower ends by integral top and bottom walls 16 and 17 respectively that are formed centrally with alined openings 18 for the free passage of the before mentioned climbing rod 7. The bottom wall 17 of this clamp casing is formed at its opposite ends with vertical openings 19 through which extend the upper screw-threaded ends of rods 20, the upper end of the before mentioned cylinder 5 being formed at points beneath the openings in said bottom wall, with laterally directed lugs 21 which are also provided with openings for the passage of said rods 20 these rods extending downwardly and being operatively connected to the movable concrete form, not shown, in a manner similar to that shown and described in our co-pending application above referred to. These rods are maintained connected to said clamp casing and to said cylinder 5 through the medium of jamb nuts 22 and 23, Figures 1 and 4.

Loosely pivotally disposed between said side walls 15, 15 of the climbing rod clamp casing and on opposite sides of the alined openings 18, 18 within the top and bottom walls 16 and 17 thereof, are gravitational clamps 24 that are weighted at their outer ends as at 25 for normally maintaining their inner toothed edges 26 in engagement with said climbing rod 7, each of these clamps being formed with slots 27 for the purpose of lightness.

Beneath the cylinder 5 and freely slidable in an upward direction upon the above mentioned climbing rod 7 is another automatic climbing rod clamp member designated generally 28 which is as clearly shown in Figures 1, 2 and 3, positioned at direct right angles to the first mentioned automatic climbing rod clamp element designated generally 14. The construction of this automatic climbing rod clamp element 28 is substantially similar to the construction of the clamp element 14, the same comprising a casing including side walls 29 integrally joined together by top and bottom walls 30 and 31, respectively, which top and bottom walls are formed centrally with alined openings 32 for the free passage of said climbing rod while pivoted between said side walls 29 are loosely pivoted clamping jaws 33 that are identical in construction to the clamping jaws 34 of the clamp element 14.

The opposite ends of the top wall 30 of said clamp casing is formed with substantially L-shaped slots for receiving the lower hooked ends 33 of relatively strong retractile springs 34 the ends of each of these springs being connected to laterally extending lugs 35 formed upon the upper end of the cylinder 5 between the before mentioned lugs 21 through the medium of bolt and nut connections 36. In view of these retractile springs 34 the different parts of this automatic pneumatic jack are maintained in the positions more clearly shown in the detailed cross sectional view, Figure 3.

In actual practice the climbing rod 7 is positioned properly with respect to the movable concrete form to be slowly raised, it being of course understood that the elements of our improved pneumatic jack are to be positioned thereon and inter-connected as shown in said cross sectional view, Figure 3. After the rods 20, 20 have been connected at their lower ends to the concrete form and it is desired to slowly raise the same, air is injected into the upper end of the cylinder through the compressed air pipe 11. The jaws 33 in the lowermost clamp element 28 will tightly grasp the climbing rod 7 and thereby prevent any downward movement of this clamp element or the other parts of the invention. The air pressure on entering the cylinder 5 above the piston 9 will cause this piston to contact with the top wall 30 of the lowermost clamp element, and in view of the fact that movement of this clamp element is prevented by the jaws 33 the cylinder 5 will slowly rise for consequently carrying upwardly the concrete form through the medium of the connection rods 20, 20. The upward movement of said cylinder 5 will expand the springs 34 the tension of these springs however, being such as not to overcome the air pressure within the cylinder and upon a continued upward movement of this cylinder, the air port 13 adjacent the lower end thereof will be uncovered by the piston 9 for thereby allowing the escape of the air and preventing further upward movement of the cylinder. After said cylinder has reached its limit of upward movement, the compressed air supply is turned off after which the pet cock 12 may be opened to a desired degree, whereupon the springs 34 in assuming their normal positions will consequently draw upwardly

upon the automatic clamp element 28 and return the piston 9 to its normal position within the cylinder for allowing the operation to be repeated.

We have described our improved automatic pneumatic jack as being employed in conjunction with the slow raising of movable concrete forms, it is nevertheless, to be understood that we do not wish to limit this improved jack to such a use, as in the future practice of the invention the same may be employed in conjunction with the hoisting of numerous devices.

In view of the above description when considered in conjunction with the accompanying drawings, the detailed operation together with numerous advantages of a pneumatic jack of this character will be at once appreciated by those skilled in the art, and even though we have herein set forth that this jack consists of certain detailed structural elements, it is nevertheless to be understood that departures may be made from the different elements of this invention, without deviating from the spirit and scope of the appended claims.

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

1. In a hoisting device of the character set forth, a guide, a jack slidable upon said guide and comprising upper and lower relatively displaceable members, means for facilitating the displacement of said members, means for preventing the movement of the lower member in one direction when the upper member is moving in an opposite direction, means for moving said lower member in an upper direction when said upper member has stopped, means for holding said upper member against downward movement as said lower member is being moved upwardly, said means for moving said lower member upwardly comprising spring connections between said upper and lower members.

2. A device of the class described comprising a pair of relatively slidable interfitting members movably mounted on a rod, interconnected gripping means movable on the rod in one direction, for preventing movement of the members in the opposite direction and adapted to normally operate the members to hold them in a predetermined relation, and means for effecting a relative movement between said members from said predetermined relation.

3. A device of the class described comprising a pair of relatively slidable interfitting members movably mounted on a rod, gripping means for each of said members mounted on the rod for securing said members against movement on said rod, means for connecting the gripping means for each member normally operable for moving and holding said members in a predetermined relation, and fluid actuating means for producing a relative movement of the members.

4. A device of the class described, comprising a pair of relatively slidable interfitting members movably mounted on a rod, gravity actuated gripping means associated with each member and mounted for gripping action in one direction on said rod, and means for producing a relative sliding movement of the members.

5. A device of the class described, comprising a pair of relatively slidable interfitting members movably mounted on a rod, gravity actuated gripping means mounted for one way movement on said rod having a casing provided with a pair of pivoted gripping pawls at opposite sides of the rod, adjacent ends of which are formed for gripping said rods and the opposite ends of which are formed with weighted portions adapted to normally actuate said pawl to grip said rod, and means for producing a relative sliding movement of the member.

6. A device of the class described, including a pair of relatively slidable interfitting members movably mounted on a rod, a pair of gripping means mounted for one-way movement on said rod, and carried by one of said members, one of said gripping means being resiliently connected to said member and engaging the other member adapted for preventing movement of the last mentioned member on the rod, and means for effecting a relatively slidable movement of said member.

7. A device of the class described including a cylinder slidable on its rod, a piston slidable in said cylinder, a gripping member mounted on one end of said cylinder and said rod, and adapted to grip said rod for preventing a movement of the cylinder on the rod, a gripping member mounted on the rod beyond the opposite end of the cylinder, and adapted for engaging the piston to prevent movement of the piston relative to the rod, spring members connecting the cylinder and the last mentioned gripping member, for normally pulling said gripping member toward the cylinder, and fluid actuating means for moving the piston in the cylinder.

In testimony whereof we affix or signatures.

JOHN L. STRANDBERG.
LARS E. J. BLOMBERG.