Nov. 17, 1931. F. H. KNEELAND 1,832,639

CARTRIDGE CHARGING DEVICE

Filed Aug. 21, 1929

Fig. 1.

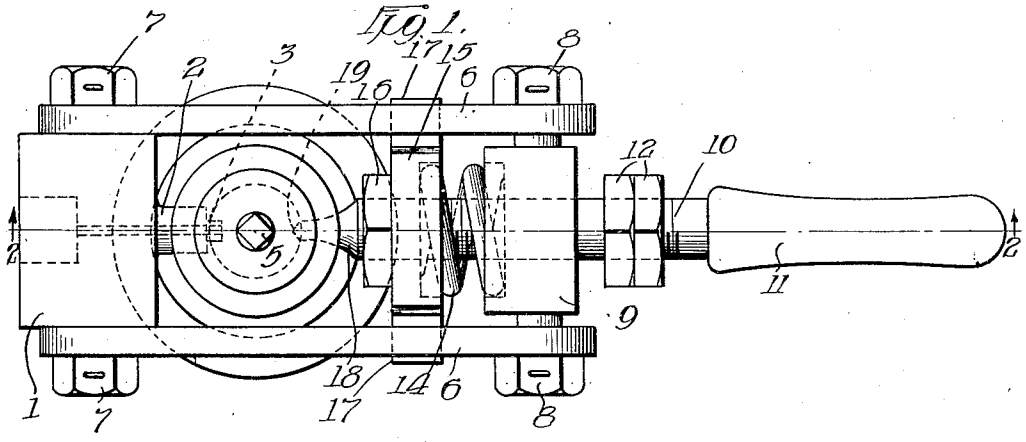



Fig. 2.

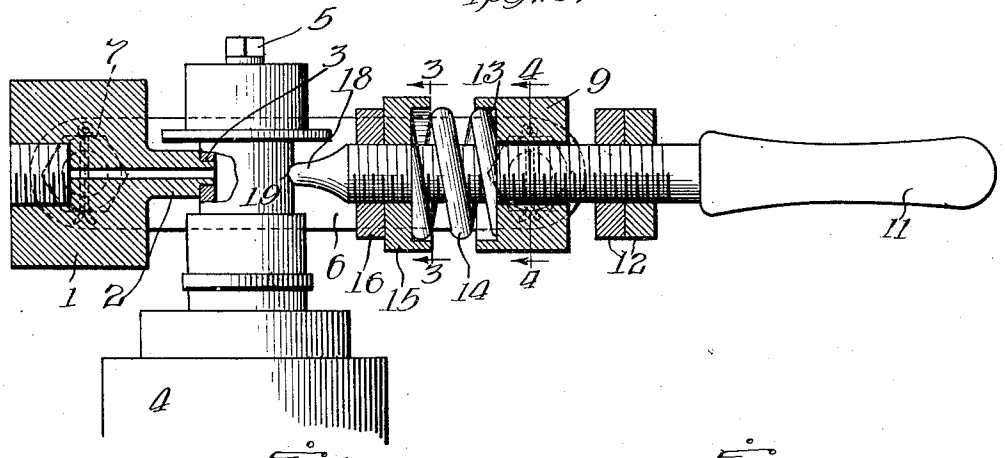



Fig. 3.

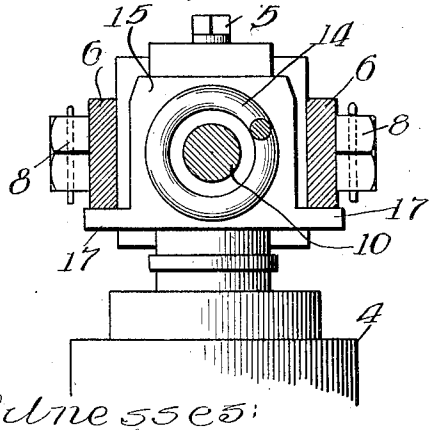
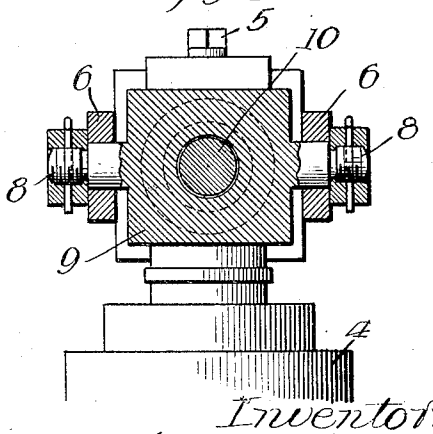



Fig. 4




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# UNITED STATES PATENT OFFICE

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## CARTRIDGE CHARGING DEVICE

Application filed August 21, 1929. Serial No. 387,408.

The present invention is concerned with a mechanism for charging gas filled blasting cartridges. The general type of cartridge is indicated in co-pending application Serial No. 410,196 filed Nov. 27, 1929. Specifically, the present charging mechanism is designed for cartridges of the type indicated, but wherein the charging orifice is located in the side rather than the end of the cartridge. This change in location of the charging orifice necessitates an entirely different form of clamp mechanism than that shown in the said co-pending application.

The principal object of the invention is to provide a simple hand operated clamping means for use in connection with charging apparatus and blasting cartridges of the side charge type.

Other objects relate to details of construction which will be hereinafter pointed out.

In the drawings,

Figure 1 is a top plan view of a charging mechanism constructed in accordance with the present invention.

Figure 2 is a vertical section through the charging mechanism shown in Figure 1 and taken along line 2—2 of that figure.

Figure 3 is a vertical section taken along line 3—3 of Figure 2.

Figure 4 is a vertical section taken along line 4—4 of Figure 2.

The charging mechanism is of very simple construction and includes merely a stationary charging head 1 having a horizontally extending nozzle 2 which is adapted to cooperate with a lateral charging orifice 3 of a blasting cartridge 4. The problem here involved is simply that of forcing the cartridge against the charging nozzle with sufficient force to effect a sealing relation therebetween in order to prevent the leakage of gas while a cartridge is being charged. This gas is usually charged into the cartridges at a pressure approximating 1000 pounds per square inch and for this reason a positive pressure of considerable magnitude is required to effect the seal between the cartridge and the nozzle. Also, it is desirable that this clamping be effected very rapidly and that the clamping means be of such a nature as to automatically lock the cartridge under pressure during the charging operation.

For the purpose indicated, there is provided a self-locking toggle construction which includes a pair of spaced parallel links 6 which are pivotally connected to the stationary charging head 1 by the pivot pin 7. The opposite ends of these links are connected to a block 9 by means of pivots 8 extending laterally from opposite sides of the block. It is noted that this block 9 is freely movable about the axis of the pivot 8 and between the ends of links 6. Block 9 is formed with a bore extending transversely to the axis of the pivots, which bore is of such diameter as to freely receive the screw threaded operating rod 10. A second block 15 is freely mounted on the operating rod 10 and this block is provided with lateral projections 17 which are adapted to underlie the links 6 and under appropriate circumstances to engage the lower surfaces of these links and thus limit the pivotal movement of the block 9 and the operating rod 10 carried thereby. Interposed between the blocks 9 and 15 is a heavy coil spring 14 which tends to move the two blocks apart. Lock nuts 12 are arranged on threaded bar 10 for the purpose of limiting the movement of the rod 10 through the block in one direction. A similar lock nut 16 is positioned on the rod 10 adjacent to the opposite end thereof for the purpose of limiting the movement of the block 15 on the rod. By virtue of this arrangement the spring 14 tends to force the rod 10 toward the charging head 1. The extremity of the rod 10 is somewhat pointed as indicated at 18 and is adapted to cooperate with the notch or depression formed in the cartridge at a point diametrically opposite the charging orifice thereof. The opposite end of rod 10 is provided with an operating handle 11.

In the use of this improved charging mechanism and clamp, a cartridge to be charged is first positioned with its discharge orifice in engagement with the end of the charging nozzle 2. The links 6 and associated elements are then moved outwardly from their inoperative position above the charging head.

By manipulation of the handle 11 the pointed end 18 of the rod 10 may be brought into engagement with the depression 19 of the cartridge and by further downward movement of the handle 11 the parts will be brought into the position shown in Figure 2 wherein the lugs 17 of the block 15 are in engagement with the lower surfaces of the links 6, thus stopping the downward movement of the handle. In bringing the parts to this position the block 9 together with the parts carried thereby has pivotal movement on the links 6 and the rod 10 is gradually forced axially through the bore of the block against the opposition of the spring 14. It will be noted that the clamp is self-locking by reason of the fact that when in clamping position the three pivot points involved lie in a substantially straight line. When the cartridge has been charged, the handle 11 may be moved upwardly, thus breaking the toggle joint and relieving the pressure so that the cartridge may be removed.

Claims:

1. In a device of the character described, a charging head having a laterally extending nozzle adapted to cooperate with a lateral charging orifice of a cartridge to be charged, a pa r of parallel links pivotally connected to said head, a block pivotally mounted between the opposite ends of said links, a threaded operating lever extending transversely through said block and slidably mounted therein, a second block surrounding said lever and a spring interposed between said blocks, one end of said lever being provided with an operating handle and the opposite end being adapted for engagement with a cartridge to be charged.

2. In a device of the character described, a charging head having a laterally extending nozzle adapted to cooperate with a lateral charging orifice of a cartridge to be charged, a toggle mechanism for clamping a cartridge against said nozzle, one arm of said toggle having a relatively fixed pivotal anchorage to one side of said nozzle, the other arm having pivotal connection intermediate its ends with the free end of the first said arm, said other arm having slidable connection with said pivotal connection and a spring associated with said arm for opposing sliding movement thereof.

3. In a device of the character described, a charging head having a laterally extending nozzle adapted to cooperate with a cartridge to be charged. a pair of spaced links pivotally connected to opposite sides of said head, a block pivotally mounted between the free ends of said links, said block having a bore therethru transverse to its pivotal axis, a rod passing freely thru said bore and projecting on opposite sides of said block, one end of said rod forming an operating handle and the opposite end being formed to engage a cartridge, and spring means associated with said rod and block to oppose relative movement thereof.

Signed at Chicago, Illinois this 12th day of August, 1929.

FRANK H. KNEELAND.