Sept. 2, 1947. G. F. PALDANI 2,426,898

CARTRIDGE LOADER

Filed Jan. 26, 1945 2 Sheets-Sheet 1

Fig. 1.

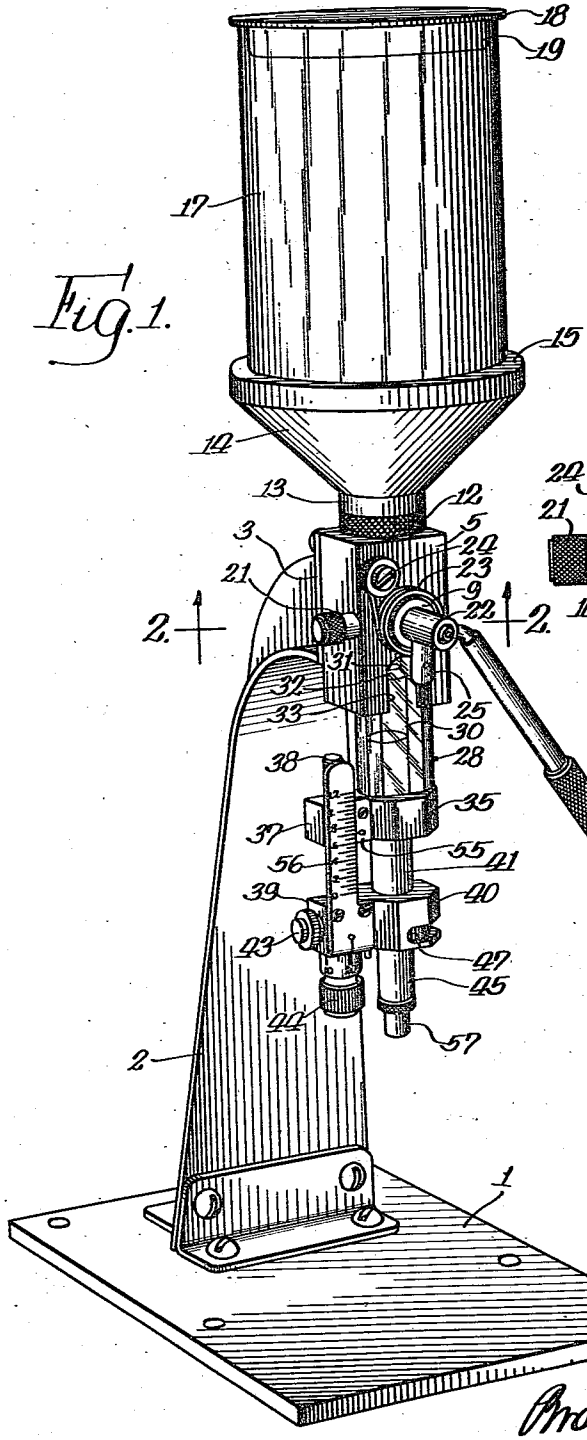
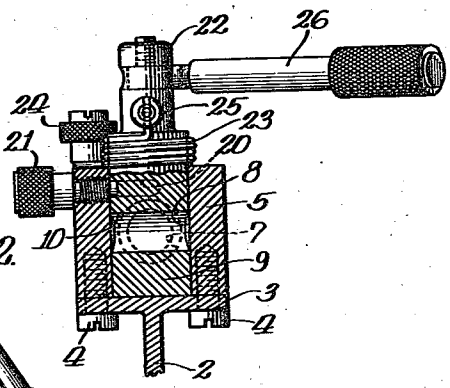


Fig. 2.



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Fig. 3.

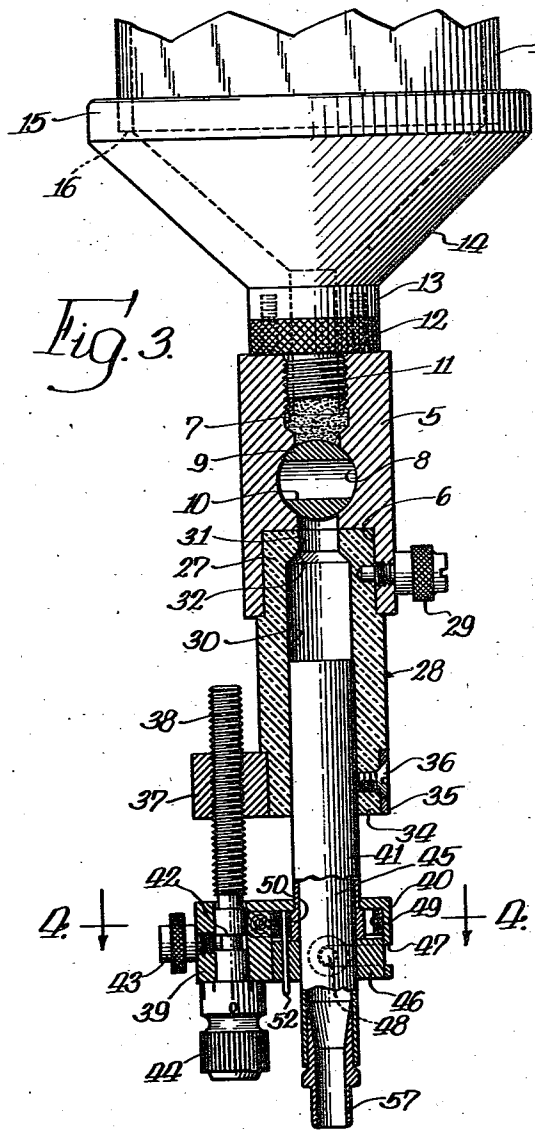


Fig. 4.

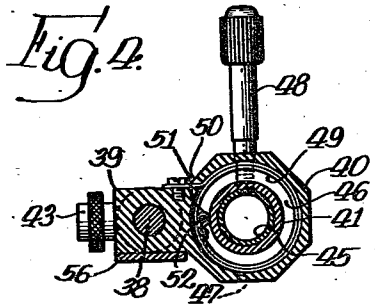


Fig. 5.

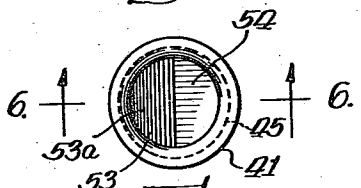


Fig. 6.

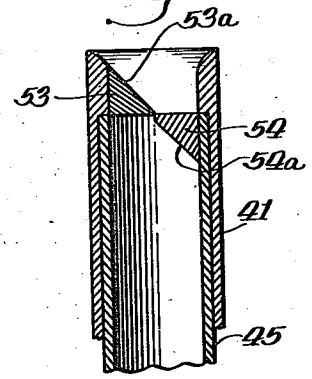
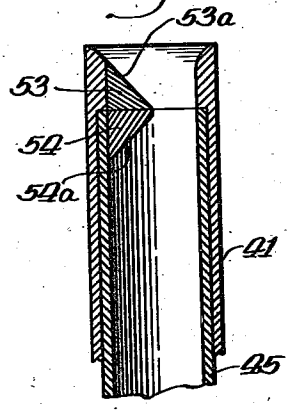


Fig. 7.



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CARTRIDGE LOADER

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6 Claims. (Cl. 86—31)

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This invention relates to measuring devices, and has to do with a cartridge loader whereby gun powder may be delivered from a hopper or container in accurately measured amounts and charged into cartridge casings.

It is known to provide devices of the general character above referred to, in which the powder is delivered from the hopper in accurate amounts and charged into cartridge casings, but all of such devices with which I am familiar are of rather complicated construction and operation and employ valves operating through slots or openings in the device so that considerable spillage of powder is apt to occur, which is objectionable for obvious reasons. My invention is directed to the provision of a cartridge loader of comparatively simple construction and operation and which avoids the above noted objection to the known devices referred to with respect to spillage of powder. More specifically, I provide a cartridge loader in which the delivery of powder from the hopper to the measuring chamber, and the discharge of the powder from the measuring chamber into the cartridge casing, are controlled by valves enclosed within the structure of the device without openings therethrough to the exterior thereof, whereby spillage of powder is prevented. The parts of the device are so constructed and related that they may readily be disassembled for cleaning, repair or replacement and may as quickly be reassembled, and accuracy of adjustment of the parts is assured whereby any desired charge of powder, within limits, may be discharged into the cartridge casing. Further objects and advantages of my invention will appear from the detail description.

In the drawings:

Figure 1 is a perspective front view of a cartridge loader embodying my invention;

Figure 2 is a sectional view, on an enlarged scale, taken substantially on line 2—2 of Figure 1, certain parts being shown in elevation and certain parts being broken away;

Figure 3 is a central vertical transverse sectional view of the mounting block and the parts carried thereby, on the same scale as Figure 2, certain parts being broken away and certain other parts being shown in elevation;

Figure 4 is a sectional view taken substantially on line 4—4 of Figure 3;

Figure 5 is a plan view, on an enlarged scale, of the discharge tube and valve means with the movable tube in its normal closed position;

Figure 6 is a fragmentary sectional view taken substantially on line 6—6 of Figure 5; and

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Figure 7 is a view like Figure 6 but with the inner movable tube in its open position.

The cartridge loader comprises a base plate 1 to which is secured a suitable standard 2 carrying at its upper end a rectangular mounting plate 3 to which is secured, by screws 4 or in any other suitable manner, a cubiform mounting block 5. The block 5 is recessed from its lower end at 6, and is provided with a central bore 7 of step formation extending from its upper end and opening at its lower end into the recess 6. Block 5 is further provided, at about its mid-length, with a cylindrical bore 8 extending from its front face rearward beyond bore 7, intersecting the latter bore, this bore 8 receiving a cylindrical plug valve 9 having a diametrical opening 10 therethrough. The block 5 is interiorly threaded at the upper enlarged portion of bore 7 for reception of an exteriorly threaded nipple 11 of a ring 12 secured by screws, or in any other suitable manner, to a neck 13 at the lower end of a hopper bottom member 14 of inverted frusto-conical shape. Member 14 is provided at its upper end with an upwardly extending circumferential flange 15 extending upward a short distance beyond the interior shoulder 16. A cylindrical hopper body 17 seats at its lower end on shoulder 16 and has a friction fit in flange 15 so as to be retaained thereby in the hopper bottom 14 against accidental dislodgement. The upper end of body 17 is closed by a flanged cover 18 having an inwardly offset flange 19 which has a friction fit in the upper end of body 17. It will be seen that the hopper bottom 14 together with the body 17 constitute a hopper for containing the charging powder, this hopper having a bottom outlet opening extending through ring 12 and nipple 11 thereof into the bore 7 of block 5, flow of powder through bore 7 being prevented by valve 9 when the latter is in its closed position shown in Figure 3, turning of valve 9 into position to bring the diametrical bore 10 thereof into alignment with the bore or passage 7 permitting flow of powder through the latter passage, as will be readily understood.

Referring to Figure 2, valve 9 is provided, a short distance from the forward end thereof, with a circumferentially extending outwardly opening groove 20 which receives the inner end of a dog pointed screw 21 threaded through the side of block 5. Groove 20 is of such length and so disposed that the wall at one end thereof contacts screw 21 when valve 9 is in its closed position shown in Figure 3, and the wall at the other end of groove 20 contacts screw 21 when valve 9 has been turned through an angle of 90 degrees from

its position of Figure 3, into a position in which bore 10 of valve 9 is aligned with passage 7. It will be noted that the body of valve 9 projects outward a short distance beyond the front face of block 5 and that this valve is provided with a reduced forwardly extending stem 22. A torsion spring 23 is coiled about the projecting forward portion of the body of valve 9 and is anchored, by a shouldered screw 24, to block 5, at one end, the other end of this spring being bent at an angle, so as to extend forwardly from block 5, and inserted through a stud 25 secured to and extending radially from stem 22. The spring 23 urges valve 9 in clockwise direction, as viewed in Figures 1 and 3, and normally holds it in its closed position of Figure 3. An operating arm 26 is secured to stem 22 of valve 9 and, in the normal closed position of this valve, extends from stem 22 at a downward inclination. Arm 26 provides convenient means for turning valve 9 in counter-clockwise direction, in opposition to spring 23, into its open position, and upon release of arm 26 this valve is returned to its normal closed position by spring 23, as will readily be understood.

The recessed lower end portion of block 5 receives upper reduced portion 27 of a sleeve 28, secured in block 5 by a dog pointed screw 29 threading through one side of the block with its inner end portion engaged into a suitable recess in the side of the sleeve. Sleeve 28 is provided with a bore 30 of uniform diameter extending from its lower end and opening, at its upper end, into a reduced bore 31 extending from the upper end of sleeve 28, the latter bore being of the same diameter as the lower end of bore or passage 7 of block 5, there being a downwardly flaring area 32 connecting the bores 31 and 30 for free flow of the powder from the former into the latter. Preferably, the sleeve 28 is formed of transparent material, conveniently of a transparent synthetic resin or plastic, and the body 17 of the hopper also is preferably formed of a similar transparent material. The block 5 is provided with a slot 33 in its front wall extending from the lower edge thereof to within a short distance of the upper end of recess 6, and the front of the sleeve 28 is slabbed off or flattened, to give ready vision of the upper portion of bore 30 of sleeve 28, for a purpose which will be explained later.

The lower end portion 34 of sleeve 28 is reduced somewhat and has secured thereabout a collar 35, conveniently by means of a screw 36 passing through collar 35 and threading into portion 34 of sleeve 28. Collar 35 is provided at one side thereof with a lug 37, which is vertically bored and tapped for reception of an adjusting screw 38 threaded therethrough. Screw 38 is rotatably mounted through a lug 39 of a collar 40 fixed to a tube 41, adjacent the lower end thereof, slidably mounted in sleeve 28 and extending downward therefrom. Screw 38 is provided with a circumferential groove 42, which receives the point of a dog pointed screw 43 threaded in lug 39 and restraining screw 38 against endwise movement through lug 39. At its lower end, screw 38 is provided with a suitably formed head 44, the lower portion of which is suitably formed to provide a knurled knob for rotating screw 38 and the upper portion of which is in the form of a cylinder disposed at the under face of lug 39. It will be seen that the screw 38 and collar 40, in conjunction with the collar 35 and lug 37 thereof, provide means for adjusting tube 41 lengthwise in sleeve 28 while restraining this tube against turning movement.

An inner tube 45 fits snugly in tube 41 for turning movement therein and extends downward therefrom. A collar 46 is fixed on tube 45, at the lower end of outer tube 41, and fits within collar 40 which, as shown more clearly in Figure 3, is recessed from beneath to accommodate collar 46. Collar 40 is provided, at the side thereof opposite to lug 39, with a circumferentially extending slot 47 extending one-half the circumference thereof, this slot accommodating an operating arm 48 detachably secured to collar 46, conveniently by being threaded therein. Arm 48 restrains collar 46, and with it inner tube 45, against downward movement relative to tube 41 while providing convenient means for turning tube 45. As is shown more clearly in Figure 3, outer tube 41 extends downward a short distance within collar 40 so that collar 46 is spaced a short distance from the underface of the top wall of collar 40, providing space for a spirally wound spring 49 disposed about the lower end portion of tube 41. One end of spring 49 passes through a slot 50 (Figure 4) in collar 40 and is anchored to the inner or rearward face of lug 39 in a suitable manner, conveniently by means of a screw, and the other or inner end of spring 49 is formed into a loop 51 which receives a pin 52 passing through collar 46. The spring 49 is a torsion spring and normally holds tube 45 in position with arm 48 in contact with collar 40 at the inner or rearward end of slot 47. The pressure between the parts, due to the torsion effect of spring 49, may be relied upon for maintaining the pin 52 in position, or this pin may be secured in loop 51 of spring 49 in any suitable manner. From what has been said, it will be understood that the inner tube 45 normally is held in position with arm 48 at the inner end of slot 47, tube 45 being then in its closed position, and that this tube may be turned in the outer tube 41 at an angle of approximately 180 degrees, until the arm 48 contacts the outer or front end of slot 47 and, upon release of arm 48, will be returned by spring 49 to its normal closed position.

Referring to Figures 5 to 7, inclusive, the upper end of inner tube 45 contacts the underface of a valve element 53 carried by outer tube 41 adjacent the upper end thereof. This valve element 53 is in the form of a block secured in tube 41 in any suitable manner, is substantially semi-circular in plan and has a flat horizontal underface which overlies approximately one-half of the cross sectional area of inner tube 45. A similar valve element 54 is suitably secured in the upper end of the inner tube 45, this valve element 54 having a flat horizontal upper face which is approximately semi-circular in plan, the valve element 54 occupying substantially one-half of the cross sectional area of the interior of the inner tube 45. The upper face 53a of valve element 53 is inclined downward and inward of tube 41 at an angle of approximately 45 degrees, and the underface 54a of valve element 54 is inclined downward and outward of the inner tube 45 at an angle of approximately 45 degrees. In the normal closed position of the inner tube 45, the valve elements 53 and 54 are opposed, with the inner edge of element 54 underlying to a slight extent the inner edge portion of valve element 53 and, in cooperation therewith, providing closure means for the discharge passage defined by the inner tube 45. When tube 45 is turned into its open position, shown in Figure 7, valve element 54 is disposed in underlying relation to valve element 53 provid-

ing an opening from bore 30 of sleeve 28, above tube 45, into the latter tube, the inclined underface 54a of valve element 54 defining with the upper end portion of tube 45 a downwardly flaring passage into the latter, which facilitates flow of the power thereto.

The space between valve 9 (Figure 3) and the upper face of valve element 54 of tube 45, including the upper end portion of tube 41, the lower end portion of passage or bore 7, bore 31, flare 32 and the portion of bore 30 above tube 41, constitutes a measuring chamber. By adjusting tube 41, and with it tube 45, lengthwise the effective capacity of the measuring chamber may be varied so as to provide any charge desired within limits. A small plate 55 bearing an index mark is secured by a screw, or in any other suitable manner, to the front face of lug 37 of collar 35 adjacent the latter. An elongated plate 56 is secured, by screws or in any other suitable manner, to the front face of lug 39 of collar 40 and extends upward from lug 39 with its inner edge adjacent and parallel with the outer edge of plate 37, this upwardly extending portion of plate 56 bearing on its front face a series of vertically spaced graduations providing a scale for cooperation with the index mark on the plate 37. At its lower edge plate 56 is provided with an index mark which cooperates with the marks of a scale on head 44 of adjusting screw 39. The graduations on the main scale indicate inches and fractions thereof and the graduations on the head 44 of screw 38 indicate fractions of an inch, the pitch of the threads of screw 38 being such that one complete rotation of this screw moves the collar 40 .05 inch, with corresponding lengthwise movement of the tubes 41 and 45. When the zero mark on the main scale is in register with the index mark on the plate 37, the tubes 41 and 45 have been raised to their maximum extent and the measuring chamber is of minimum effective capacity, and when the highest mark on the main scale is in register with the index mark on plate 37 the tubes 41 and 45 have been moved to their lowermost positions contemplated in the use of the device, the measuring chamber being then of maximum effective capacity. The scale on head 44 of screw 38, in conjunction with the graduation mark at the lower end of plate 56, provides for fine or micrometer adjustment of the tube for assuring accuracy of the charge, which is of importance. Conveniently, a discharge nipple 57 has a friction fit in the lower end of the tube 45 and extends downward therefrom, the upper portion of this nipple having an upwardly flaring bore providing a feather edge at the upper end of the nipple, which avoids interference with the discharge of the powder therethrough from tube 45. The lower portion of nipple 57 is of substantially uniform interior and exterior diameter. The interior diameter of the lower portion of nipple 57 is such as to snugly receive the neck of the casing of a cartridge intended to receive the minimum charge of powder, such as a 22 caliber high power cartridge. The exterior diameter of the lower portion of nipple 57 is such as to fit snugly into the neck of the casing of a cartridge of larger caliber, such as a 30 caliber cartridge. In charging cartridge cases which will not readily fit either in or over the lower portion of nipple 57, the powder discharged from the nipple, or from the lower end of tube 45 if nipple 57 be omitted, may be directed by a small funnel into the cartridge casing, as is well known.

The use of the device is thought to be clear from the above description. The hopper is filled, either partly or completely, with powder suitable for use in the cartridge casings to be charged or loaded. The powder flows by gravity from the hopper downward into the upper portion of bore or passage 7 above valve 9, this valve normally being closed as shown in Figure 3. After the tubes 41 and 45 have been adjusted lengthwise to give the proper charge of powder, valve 9 is turned into its open position, in which it is held until the measuring chamber has been filled with powder, the interior of this chamber being readily visible for the major portion of its extent through the transparent sleeve 28. When the measuring chamber has been completely filled with powder, valve 9 is released and is returned to its closed position by the torsion spring 23. Sleeve 45 is then turned to its open position and the powder is discharged therethrough from the measuring chamber into the cartridge casing. In that manner cartridge casings may be loaded with expedition and facility and, since the valve means controlling delivery of powder from the hopper to the measuring chamber and discharge of the powder from that chamber are effectively enclosed, objectionable spillage of powder is prevented. It will also be seen that the various parts of the device are readily accessible and may easily be disassembled for cleaning, repair or replacement and easily reassembled, which is desirable in devices of this character.

It will be understood that changes in construction and arrangement of parts of my invention may be resorted to without departing from the field and scope thereof, and I intend to include all such variations, as fall within the scope of the appended claims, in this application in which the preferred form only of my invention has been disclosed.

I claim:

1. In cartridge loading means of the character described, a hopper for powder, a sleeve, an outer tube fitting in said sleeve from the lower end thereof, an inner tube fitting in said outer tube defining a discharge passage, means for delivering powder from said hopper to said sleeve above said tubes, a valve element carried by said outer tube at one side thereof occupying approximately one half of the cross sectional area of said outer tube and overlying the upper end of said inner tube in proximity thereto, and a valve element in said inner tube at the upper end thereof occupying approximately one half the cross sectional area of said inner tube, the latter having turning movement in said outer tube to a closed position in which the inner tube valve element is opposed to the outer tube valve element providing in cooperation therewith a closure for said discharge passage and an open position in which the inner tube valve element underlies said outer tube valve element providing an opening from said sleeves to said discharge passage.

2. In cartridge loading means of the character described, a hopper for powder, a sleeve, an outer tube fitting in said sleeve from the lower end thereof, means for delivering powder from said hopper to said sleeve above said tube, an inner tube fitting in said outer tube defining a discharge passage, a valve element carried by said outer tube at one side thereof occupying approximately one half of the cross sectional area of said outer tube and overlying the upper end of said inner tube in proximity thereto, and a valve

element in said inner tube at the upper end thereof occupying approximately one half the cross sectional area of said inner tube, the latter having turning movement in said outer tube to a closed position in which the inner tube valve element is opposed to the outer tube valve element providing in cooperation therewith a closure for said discharge passage and an open position in which the inner tube valve element underlies said outer tube valve element providing an opening from the said sleeve to said discharge passage, the upper face of said outer tube valve element being inclined downward and inward of said outer tube and the under face of said inner tube valve element being inclined downward and outward of said inner tube.

3. In cartridge loading means of the character described, a hopper for powder, a sleeve fixed relative to said hopper, an outer tube slidably fitting in said sleeve through the lower rod thereof extending downward therefrom, connections between said sleeve and tube for adjusting the latter lengthwise and restraining it against relative turning movement, means for delivering powder from said hopper to said sleeve above said tube, and an inner tube in said outer tube defining a discharge passage and connected to said outer tube for lengthwise movement therewith, said tubes having cooperating valve elements respectively fixed thereto controlling said discharge passage and said inner tube being turnable in said outer tube to a closed position and an open position in which said valve elements are relatively disposed respectively to close and open said discharge passage.

4. In cartridge loading means of the character described, a hopper for powder, a sleeve, two telescoping tubes held against relative endwise movement extending into said sleeve through the lower end thereof, the inner one of said tubes defining a discharge passage, valve controlled means for delivering powder from said hopper to said sleeve above said tubes, a valve member carried by the outer one of said tubes, and a second valve member carried by said inner tube at the upper end thereof, one of said tubes having turning movement relative to the other tube into a closed position in which said valve members are disposed to close said passage and an open position in which said valve members are disposed to open said passage, said valve members being enclosed by said tubes and sleeve.

5. In cartridge loading means of the character described, a hopper for powder, a sleeve, two telescoping tubes held against relative endwise movement slidable as a unit in said sleeve through the lower end thereof, the inner one of said tubes defining a discharge passage, valve controlled means for delivering powder from said hopper to said sleeve above said tubes, a valve member carried by the outer one of said tubes, a second valve member carried by said inner tube, one of said tubes having turning movement relative to the other tube into a closed position in which said valve members are disposed to close said passage and an open position in which said valve members are disposed to open said passage, said valve members being enclosed by said tubes and sleeve, and means for adjusting said tubes as a unit endwise in said sleeve.

6. In cartridge loading means of the character described, a hopper for powder, a sleeve, two telescoping tubes held against relative endwise movement slidable as a unit in said sleeve through the lower end thereof, the inner one of said tubes extending downward beyond the outer one thereof and defining a discharge passage, valve controlled means for delivering powder from said hopper to said sleeve above said tubes, a valve member carried by said outer tube, a second valve member carried by said inner tube, the latter tube having turning movement relative to said outer tube into a closed position in which said valve members are disposed to close said passage and an open position in which said valve members are disposed to open said passage, said valve members being enclosed by said sleeve and tubes, and means for adjusting said tubes as a unit endwise in said sleeve.

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