H. F. McCLAIN.

GUN LOADING DEVICE.

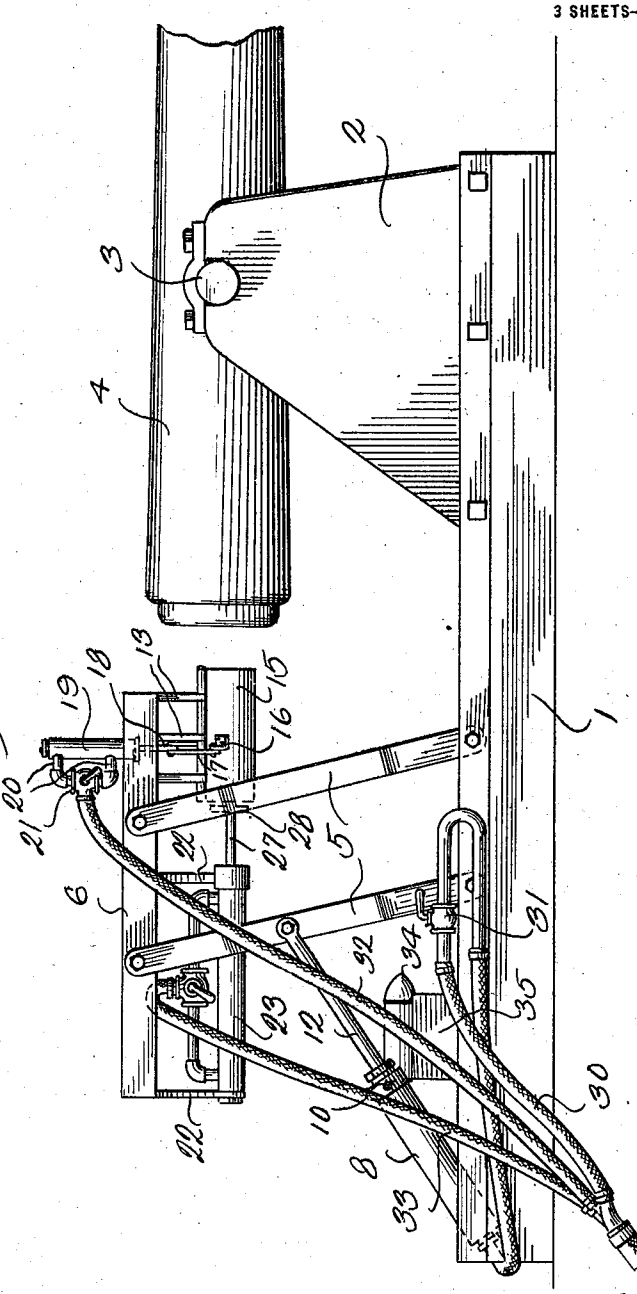
APPLICATION FILED MAY 28, 1918.

1,304,583.

Patented May 27, 1919.

3 SHEETS—SHEET 1.

Fig. 1.



Witness

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3 SHEETS—SHEET 2.

Fig. 2.

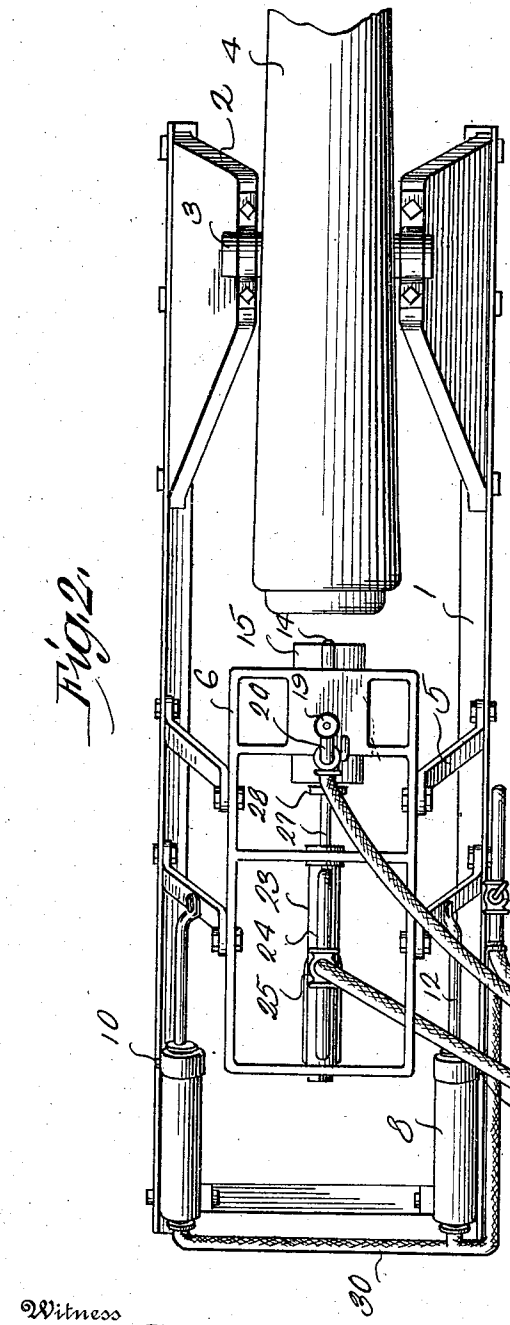
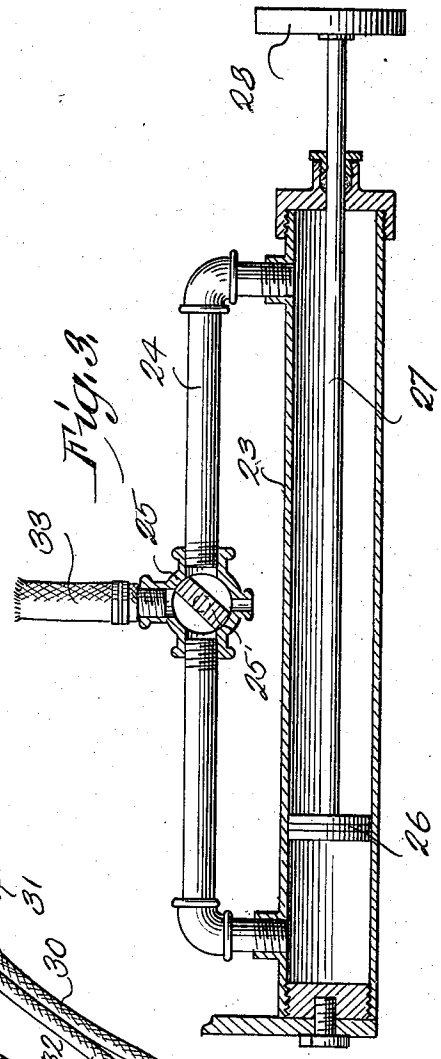


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

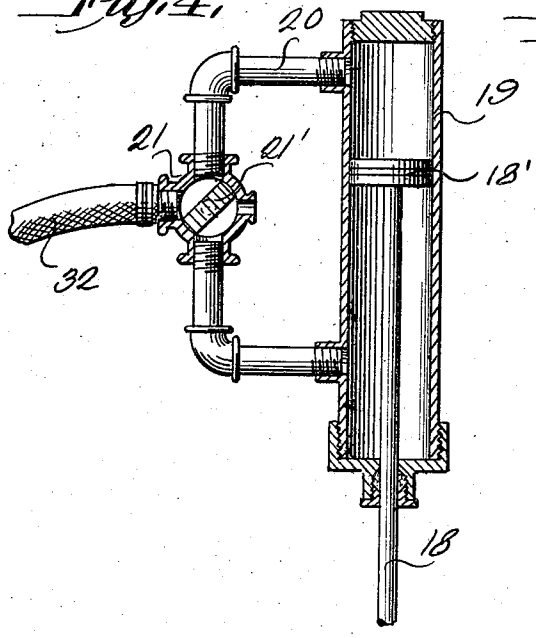


Fig. 5.

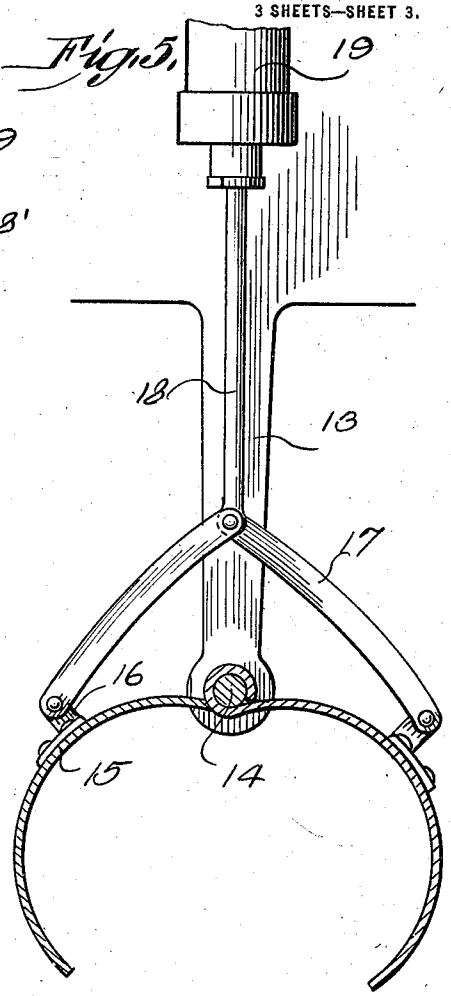
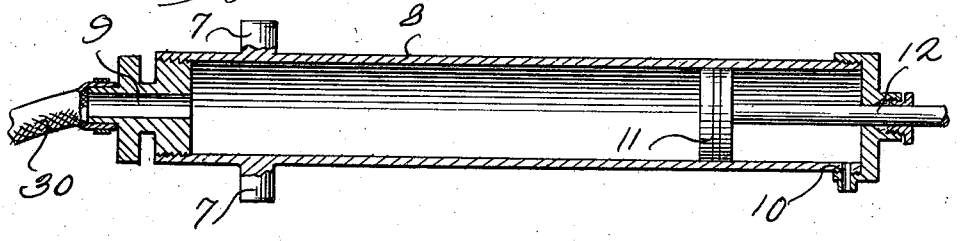


Fig. 6.



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UNITED STATES PATENT OFFICE.

HUGH F. McCLAIN, OF PROTECTION, KANSAS.

GUN-LOADING DEVICE.

1,304,583. Specification of Letters Patent. Patented May 27, 1919.

Application filed May 28, 1918. Serial No. 237,082.

To all whom it may concern:

Be it known that I, HUGH F. McCLAIN, a citizen of the United States, residing at Protection, in the county of Comanche and State of Kansas, have invented a new and useful Gun-Loading Device, of which the following is a specification.

The subject of this invention is a gun loading device intended for use with cannon and guns of large caliber in which heavy shells or projectiles are used.

The main object of the invention is the provision of means for lifting the shell or projectile and forcing it into the breech.

Another object of the invention is the provision of pressure fluid actuated means for loading a gun.

A still further object of the invention is the provision of means for gripping a projectile.

The invention also contemplates generally improving the construction and enhancing the utility of gun loading devices.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention is shown in the accompanying drawings, wherein:—

Figure 1 is a view in side elevation of the device;

Fig. 2 is a plan view of the same;

Fig. 3 is a detail view partly in side elevation and partly in section of the charge injecting mechanism;

Fig. 4 is a detail view partly in section and partly in elevation of the mechanism for operating the grappling head;

Fig. 5 is a similar view of the grappling head and its connection;

Fig. 6 is a detail view in longitudinal section of a carriage elevating cylinder.

Referring to the drawings by numerals of reference:—

A supporting base is indicated by the numeral 1, and from each side of this base at its forward end rise the blocks 2, in which are journaled the trunnions 3 of a cannon 4.

Legs or links 5 have their lower ends pivotally secured to the sides of the base 1 and their upper ends pivotally engaged with the sides of a frame 6, herein shown as rectangular.

Rocking on trunnions 7 which are suitably journaled in the rear end of the base 1, or otherwise similarly supported, are cylinders 8, one of which is positioned at each side of the base, and which are formed with inlets 9 at their rear ends and with outlets 10 at their forward ends. Pistons 11 are mounted to reciprocate in these cylinders and are provided with piston rods 12 which extend through the forward ends of the cylinders and the outer ends of which have pivotal connection with the rear legs 5. These pistons and their rods are operated to raise and lower the legs 5 in a manner hereinafter to be described.

Spaced hangers 13 depend from the forward end of the frame 6 and are apertured, at their lower ends, to receive a pin 14 which serves to hingedly connect the semi-cylindrical members 15 of the gripping or grappling head. Lugs 16 are secured to the members 15 and are connected by links 17 with the outer end of a piston rod 18, the inner end of which is secured to a piston 18′ which is mounted to reciprocate in a vertically disposed cylinder 19, which cylinder is suitably supported on the frame 6. The cylinder 19 is provided with a port at each end thereof and these ports are connected by a pipe 20 in which is interposed the valve casing 21 of a three-way admission and exhaust valve, in which casing turns a plug 21′ for the purpose of admitting pressure fluid to one end and exhausting it from the other end of the cylinder 19 to actuate the piston and open or close the grappling head.

Depending from the frame 6, and to the rear of the hangers 13, are the spaced hangers 22 which serve to support a cylinder 23, which cylinder is arranged in a horizontal position and extends longitudinally of the frame 6, to the rear of the grappling head. The cylinder 23 is provided with ports located adjacent its front and rear ends, and these ports are connected by a pipe 24 in which is interposed the casing 25 of a three-way admission and exhaust valve and in this casing a plug 25′ is turnable. The plug may be turned to admit pressure fluid to one end of the cylinder and at the same time exhaust pressure fluid from the opposite end thereof.

A piston 26 is mounted to reciprocate in

the cylinder 23 and has connected thereto a piston rod 27 which extends through the forward end of the cylinder and which has mounted on its extending end a head 28 which is adapted to contact the rear end of a projectile, when the projectile is in place in the grappling head, and force the same forwardly from the grappling head when the piston is moved forwardly.

A supply pipe 29 is connected to any suitable source of pressure fluid supply, not shown, and merges into three branches, one of which, 30, is connected to the intake ports at the rear ends of the cylinders 8. In this branch pipe 30 is provided an ordinary waste valve 31, through which pressure fluid is supplied to the cylinders 8, and which permits escape of the fluid from the rear ends of the cylinders when the supply of pressure fluid is cut off. During the forward movement of the pistons 11, due to admission of pressure fluid, air trapped in the forward ends of the cylinders will escape through the outlet ports 10, which are provided for that purpose.

Another branch pipe 32 leads to the valve casing 21 and supplies pressure fluid to the cylinder 19 for the purpose of actuating the grappling head to open to receive a projectile or close to grasp the same. The third branch pipe, 33, leads to the valve casing 25 through which it supplies pressure fluid to the cylinder 23 for the purpose heretofore set forth.

A shell or projectile is shown at 34 and it is supported on a suitable block 35 which rises from the base 1 in such position that, when the frame 6 is lowered by the legs 5 swinging rearwardly, the members 15 of the grappling head lie on each side of the projectile 34.

In practice the device is operated in the following manner:—

The projectile is placed upon the block or rest 35 and the valve 31 turned to allow the pressure fluid to escape from the cylinders 8, which allows the frame 6 to lower under the action of gravity, or the same may be pushed down if desired. When the frame is lowered the members 15 lie on each side of the projectile, and air is admitted through the valve casing 21 to the upper end of the cylinder 19 to force the piston 18′ downwardly and bring the members 15 together to encircle the projectile; the projectile being sufficiently loose within the grappling head to permit it to slide therefrom.

When the projectile is grasped by the members 15, air is turned into the cylinders 8, and their pistons 11 are forced forwardly, raising the frame 6 to bring the projectile into position to be thrust into the breech of the gun. With the parts in this position, compressed air or other pressure fluid is admitted to the rear end of the cylinder 23, which will force the head 28 forwardly to contact the projectile and thrust the same from the members 15 into the breech of the gun.

Having thus described the invention, what is claimed as new and sought by Letters Patent, is:—

1. In a device of the class described, a frame; means for mounting the frame for raising and lowering and for advancement and retraction; fluid pressure mechanism for actuating the frame; a grapple on the frame; fluid pressure mechanism on the frame for actuating the grapple; a ram operating on the frame at the rear of the grapple; and fluid pressure mechanism on the frame for actuating the ram.

2. In a device of the class described, a frame; means for mounting the frame for raising and lowering and for advancement and retraction; fluid pressure mechanism for actuating the frame; a grapple on the frame; fluid pressure mechanism on the frame for actuating the grapple; a ram operating on the frame at the rear of the grapple; fluid pressure mechanism on the frame for actuating the ram; a single source of fluid pressure supply; conduits leading from said source to each of said mechanisms; and means for controlling individually the pressure supplied by the conduits.

3. In a device of the class described, a frame; means for mounting the frame for raising and lowering and advancement and retraction; grappling jaws pivoted to the frame; first and second fluid pressure cylinders carried by the frame and disposed substantially at right angles to each other; a piston operating in the first cylinder and connected with the jaws; a ram operating in the second cylinder and coacting with the jaws; and means for supplying fluid pressure to the cylinders.

4. In a device of the class described, a base comprising a projectile support; a frame; a movable projectile grip on the forward end of the frame; a ram movable on the frame to the rear of the grip and cooperating therewith; and links connecting the frame with the base, the links constituting means for disposing the grip above the support and for disposing the ram to the rear of the support when the links are swung downwardly and rearwardly to lower the frame.

5. In a device of the class described, a base comprising a projectile support; a frame; a movable projectile grip on the forward end of the frame; a ram movable on the frame to the rear of the grip and cooperating therewith; links connecting the frame with the base, the links constituting means for disposing the grip above the support and for disposing the ram to the rear of the support when the links are swung

downwardly and rearwardly to lower the frame; a fluid pressure cylinder pivoted at its rear end to the base; and a piston operating in the cylinder, the piston being pivotally connected with one link.

6. In a device of the class described, a frame; means for mounting the frame for raising and lowering and for advancement and retraction; a cylinder mounted on the frame in a substantially vertical position; a piston operating in the cylinder; gripping jaws pivoted to the frame; and links connecting the jaws with the piston.

7. In a device of the class described, a frame; means for mounting the frame for raising and lowering and for advancement and retraction; a cylinder mounted on the frame in a substantially vertical position; a piston operating in the cylinder; gripping jaws pivoted to the frame; links connecting the jaws with the piston, the piston including a head operating in the cylinder; a conduit opening at its ends into the cylinder on opposite sides of the head and provided with an exhaust and with a fluid pressure inlet; and a valve controlling the inlet and the exhaust and directing pressure selectively toward the ends of the conduit.

8. In a device of the class described, a frame; means for mounting the frame for raising and lowering and for advancement and retraction; a cylinder mounted on the frame in a substantially vertical position; a piston including a head operating in the cylinder; gripping means mounted on the frame and operatively connected with the piston; a conduit opening at its ends into the cylinder on opposite sides of the head and provided with an exhaust and with a fluid pressure inlet; and a valve controlling the exhaust and the inlet and directing pressure selectively toward the ends of the conduit.

9. In a device of the class described, a frame; means for mounting the frame for raising and lowering and for advancement and retraction; cylinders mounted on the frame and disposed substantially at right angles to each other; a gripping means mounted on the frame; a ram operating at the rear of the gripping means; pistons operating in the respective cylinders and actuating, respectively, the gripping means and the ram, the pistons including heads located in the cylinders; conduits opening at their ends into the cylinders on opposite sides of the heads, each conduit being provided with an exhaust and with a fluid pressure inlet, each conduit being supplied with a valve controlling the exhaust and the inlet and directing fluid pressure, selectively, toward the ends of the respective conduits.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HUGH F. McCLAIN.

Witnesses:
J. N. Little,
Leroy R. Smith.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."