

G. W. WALTERS.
HYDRAULIC RAM.
APPLICATION FILED SEPT. 21, 1910.

992,524.

Patented May 16, 1911.

FIG. 1

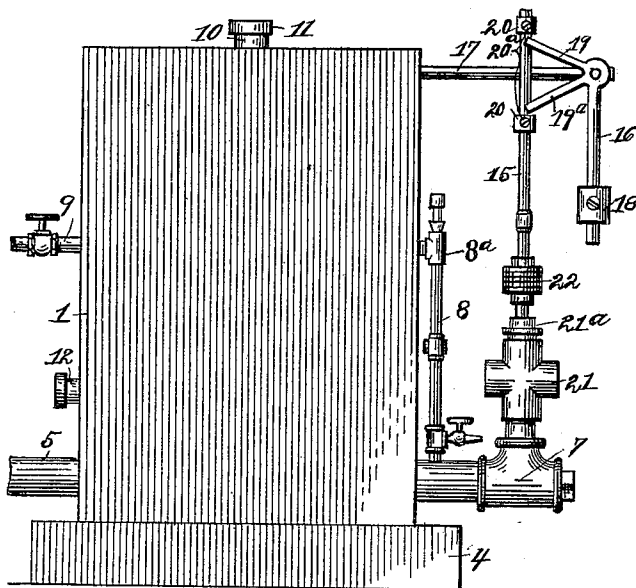


FIG. 2

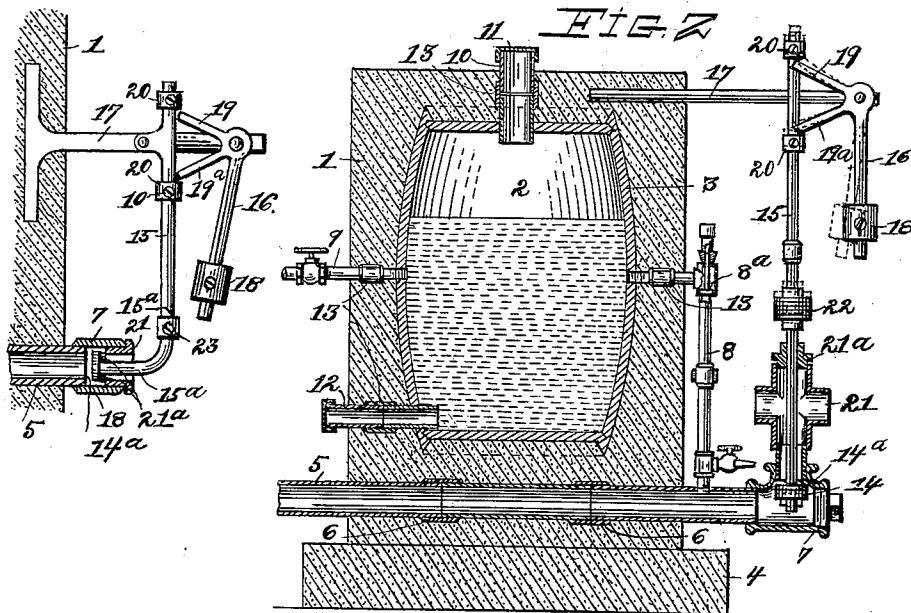
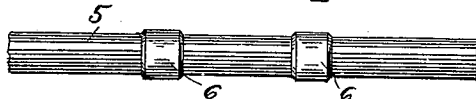


FIG. 4



Witnesses.

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GEORGE WILLIAM WALTERS, OF SHARON, PENNSYLVANIA.

HYDRAULIC RAM.

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To all whom it may concern:

Be it known that I, GEORGE W. WALTERS, a citizen of the United States, residing at Sharon, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Rams, of which the following is a specification.

My invention relates to improvements in hydraulic rams, the primary object being to provide a generally improved hydraulic ram of simple, cheap, and efficient construction, better adapted to its intended purposes than any other device of the same class with which I am acquainted.

The invention relates more particularly to improved mechanism for operating the impact or escape valve and means for regulating the sensitiveness as well as the frequency and length of stroke of the latter.

The improved impact valve is provided with pendulum mechanism adapted to perform the following functions: (1) To more quickly close the impact valve, thus preventing an unnecessary waste of the operating fluid. (2) To more quickly open the impact valve after the necessary impact or impetus has been given, thus giving the valve action greater speed, and (3) To provide a more rapid stroke or pulsation of the impact valve and regulate the same through the medium of an adjustable pendulum weight, thus enabling the ram to work faster in pumping water, and to perform its functions with less loss of the operating fluid.

With the above mentioned ends in view, the invention consists in the novel construction, arrangement and combination of parts, hereinafter described, illustrated in one of its embodiments in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the drawings, forming a part of this specification, Figure 1 is a side elevation of a hydraulic ram constructed in accordance with my invention, the improved impact valve and pendulum mechanism being shown in an intermediate position. Fig. 2, a central vertical sectional view of the same. Fig. 3, a side elevation of a modified form of impact valve and pendulum mechanism. Fig. 4, a side view of the improved drive or impact pipe.

Similar numerals of reference designate

like parts throughout all the figures of the drawings.

The parts of the improved hydraulic ram are particularly designed and adapted for use in connection with a concrete body 1, of any suitable and convenient form or configuration for containing the air chamber 2, of the improved ram. The concrete may be molded about a barrel 3, or other suitable vessel to form the air chamber and mounted upon a suitable foundation 4, and suitably submerged in the earth to protect it from sudden changes in temperature.

The drive pipe 5, is mounted in the lower portion of the concrete body and connected to a suitable source of supply, said drive pipe being anchored in the concrete body by means of annular shoulders 6. These retaining shoulders may either take the form of pipe coupling members as shown in Fig. 2, or may be cast integral with the drive pipe 5, as shown in Fig. 4.

The drive pipe 5, is provided at one end with an impact valve-body 7, and is intersected by means of a conduit pipe 8, leading upwardly and entering into the air chamber 2.

The barrel or vessel 3, forming the air chamber is provided with a valved delivery pipe 9, adapted to conduct the water to any suitable place desired; said barrel or vessel being also provided with a vertical pipe 10, at its top having the cap 11, and a horizontally extending drain-pipe 12, at its bottom to be used in cleaning out the barrel or receptacle 3, when desired. The pipes 8, 9, 10 and 12, are likewise provided with anchoring shoulders or sleeves 13, for securing the respective pipes in the concrete body. The conduit pipe 8, is provided with a check valve 8^a, operating in a well known and understood manner.

The impact valve-body 7, is provided with an impact valve 14, said impact valve being carried upon a movable or reciprocatory valve-stem 15, adapted to cooperate with and to be actuated by the pendulum mechanism hereinafter described.

A pendulum member 16, is mounted upon a supporting arm 17, embedded in and extending from the concrete body 1, said pendulum member having its depending portion provided with an adjustably mounted pendulum weight 18. The pendulum mem-

ber is provided with a pair of laterally extending arms or fingers 19 and 19^a, interposed between and adapted to alternately engage and clear a pair of adjustably mounted stop blocks 20.

The impact valve 14, when closed is adapted to be seated upon a valve seat 14^a, in the valve-body 7, and in the form of reciprocatory or vertically movable valve stem shown in Figs. 1 and 2, said valve-stem may be mounted in an overflow or waste housing 21, and as a means for cushioning the valve and stem when moved to its open position, a resilient block 22, of rubber or other suitable material may be mounted upon the valve-stem so as to impinge upon the bearing member 21^a, of the housing 21, as the valve is moved to its extreme open position.

The operation of the impact valve and the pendulum mechanism is as follows: When the impact valve is in its extreme open position and below the intermediate position shown in Figs. 1 and 2 of the drawings, and is wasting water through the valve and waste housing, the upper arm or finger 19, upon the return of the pendulum, will strike the upper stop block 20, and thus start the valve toward its seat, and the valve thus started is forced by the rush or impetus of the water upwardly with such force that the lower stop 20, will strike the lower arm or finger 19^a, of the pendulum, carrying the depending portion of the pendulum with its weight to a position to the extreme left, and the upper stop block 20, will be carried upwardly to a position sufficiently high to clear the free ends of the arms or fingers 19 and 19^a, as the pendulum swings. On the return swing of the pendulum, the lower arm or finger 19^a, will strike the lower stop block 20, and thus start the valve downwardly off of its seat, and when in its extreme open position, the lower stop block is in a position to clear the ends of the arms or fingers 19 and 19^a, as the pendulum swings or returns to its full stroke at the extreme right, after which the return motion above described again takes place and the action is repeated, the waste of the water from the impact valve taking place while the pendulum swings to the right and returns to the left. By adjusting the stop blocks 20, through the medium of the set screws 20^a, the sensitiveness of the valve and the length of its throw or stroke may be regulated as well as regulating the swing of the pendulum. By varying the adjustment

of the pendulum weight, the speed of the valve action may be likewise regulated.

In the modified form of pendulum mechanism shown in Fig. 3, the valve-stem 15, receives an oscillatory motion by being pivoted upon the supporting arm 17, opposite the-pivoted portion of the pendulum member 18, the action of the lower or free end 15^a, of the valve-stem carrying the valve 14, with respect to the vibratory movements of the pendulum member being opposite to that shown in Figs. 1 and 2, as is obvious. If desired, a weight 23, may be adjustably mounted upon the lower or free end 15^a, to regulate the sensitiveness of the valve 14, the latter being adapted in its open position to abut or impinge upon small stop members 21^a, of the waste housing to permit the outflow of the water or operating fluid.

From the foregoing description, taken in connection with the accompanying drawings, the operation and advantages of my invention will be readily understood.

Having thus described an embodiment of my invention, what I claim and desire to secure by Letters Patent is,—

1. In a hydraulic ram, an impact valve provided with a stem, stop blocks adjustably mounted thereon, and a pendulum member provided with laterally extending arms adapted to alternately engage and clear said stop blocks.

2. In a hydraulic ram, a drive pipe and impact valve having a valve stem, stop blocks adjustably mounted on said valve stem, a pendulum member provided with laterally extending arms adapted to alternately engage said stop blocks, and a weight adjustably mounted on said pendulum member.

3. In a hydraulic ram, a drive pipe provided at its end with an open valve body, a supporting arm, a vibratory valve stem pivoted on said arm and having its free end extending into said open valve body and provided with a valve, stop blocks adjustably mounted on said valve stem, and a pendulum member pivoted on said supporting arm and provided with arms adapted to alternately engage said stop blocks.

In testimony whereof I have affixed my signature, in presence of two witnesses.

GEORGE WILLIAM WALTERS.

Witnesses:

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