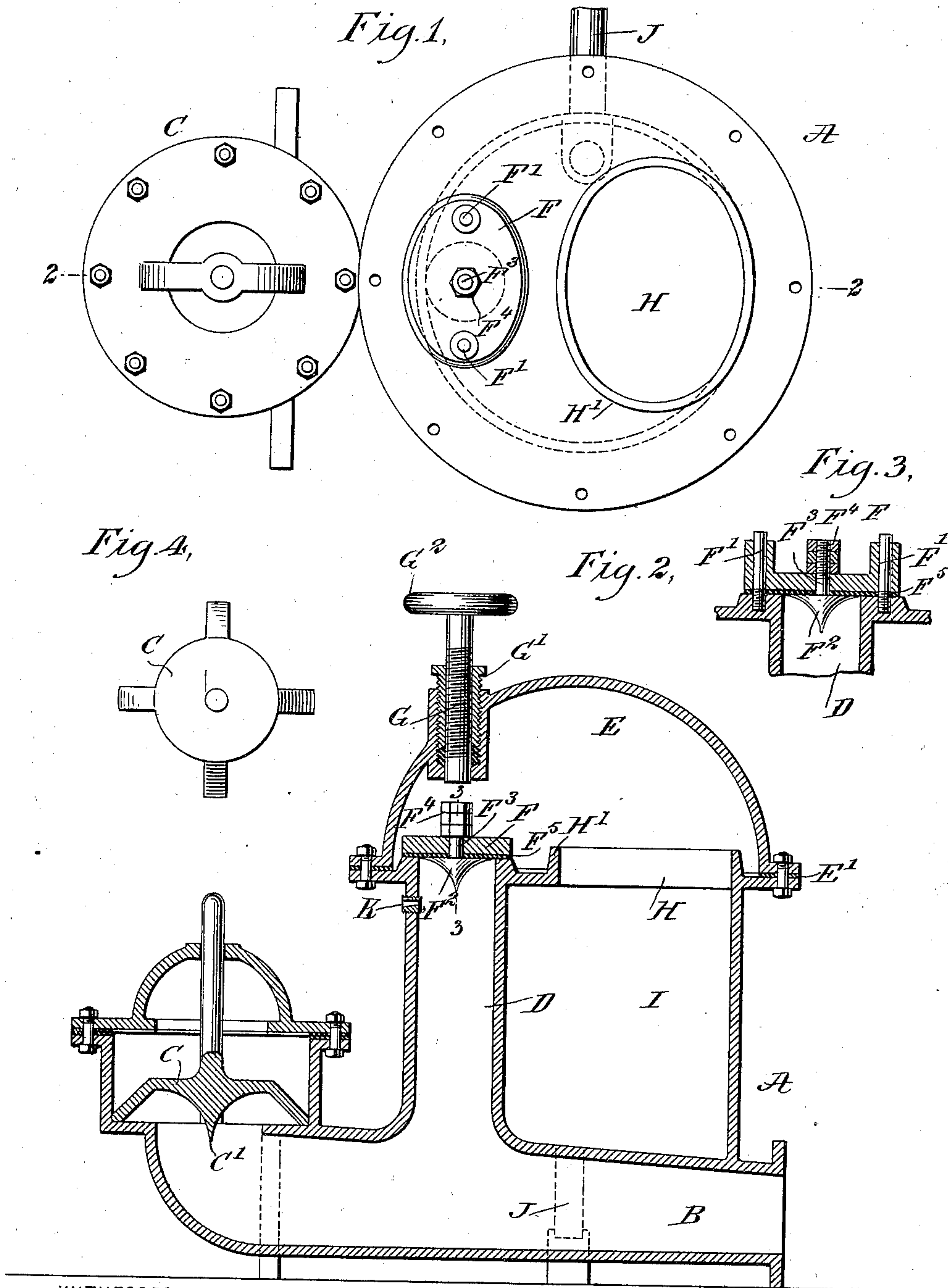


No. 731,285.

PATENTED JUNE 16, 1903.

H. CULPAN.  
HYDRAULIC RAM.  
APPLICATION FILED SEPT. 10, 1902.

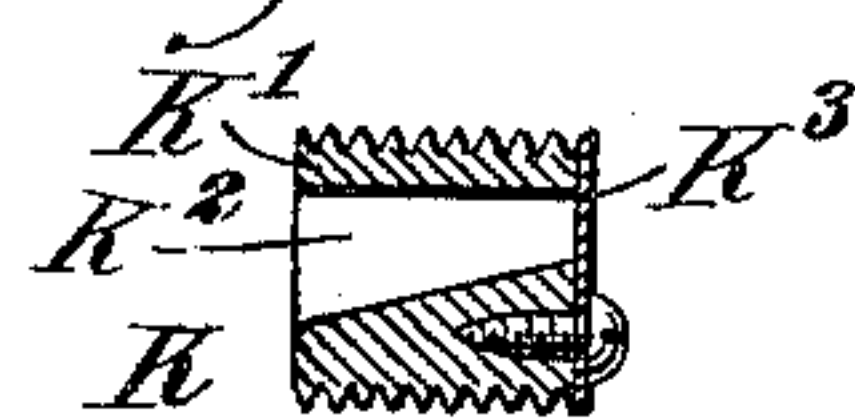
NO MODEL.



WITNESSES:

Edward Thorpe  
Rev. G. H. H. H.

Fig. 5.



INVENTOR

Herbert Culpan

BY

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# UNITED STATES PATENT OFFICE.

HERBERT CULPAN, OF AIMS, OREGON.

## HYDRAULIC RAM.

SPECIFICATION forming part of Letters Patent No. 731,285, dated June 16, 1903.

Application filed September 10, 1902. Serial No. 122,755. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT CULPAN, a citizen of the United States, and a resident of Aims, in the county of Clackamas and State of Oregon, have invented a new and Improved Hydraulic Ram, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved hydraulic ram which is simple and durable in construction, very effective in operation, and arranged to produce a greater ratio between the head of power-water and the head against which the water is discharged.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement, the air-bell being removed. Fig. 2 is a sectional side elevation of the same on the line 2 2 in Fig. 1, with the air-bell in place. Fig. 3 is an enlarged cross-section of the discharge-valve, the section being on the line 3 3 of Fig. 2. Fig. 4 is a plan view of the waste-valve, and Fig. 5 is an enlarged sectional side elevation of the snifter-valve.

The body A of the ram is provided with an inlet B, gradually increasing in size and terminating in a waste-valve C of any approved construction. From the top of the inlet B, between the entrance end thereof and the said waste-valve C, rises a passage D, opening at its upper end into an air-bell E, bolted or otherwise secured to the top of the body A, and the upper end of the said passage D is controlled by a discharge-valve F, guided in its upward movement on pins F', (see Figs. 1 and 3,) secured to the body A of the ram. The upward movement of the discharge-valve F is limited by a screw-rod G, screwing in a suitable stuffing-box G', carried by the bell E, the outer end of the screw-rod being provided with a suitable hand-wheel G<sup>2</sup>, under the control of the operator, for screwing the screw-rod G inward nearer to or farther from the valve F to limit the rising motion thereof.

The valve F is provided on its under side with a cone F<sup>2</sup>, having a central stem F<sup>3</sup>, passing through the valve F and engaged by nuts F<sup>4</sup>, screwing against the top of the valve to draw the base of the cone F<sup>2</sup> firmly in contact with the leather or rubber facing F<sup>5</sup> of the valve to hold the said facing in position on the valve. The air-bell E is connected at one side of the valve F by an opening H with a discharge-chamber I, from which leads a pipe J to conduct the water to the head against which it is to be discharged.

The opening H is surrounded by a rising flange or rim H' to retain a quantity of water in the bottom of the bell E around the valve F to prevent the escape of air from the bell and also to prevent air from escaping past a packing E', interposed between the bell and the body A.

In the vertical passage D is arranged a snifter-valve K, having a screw-plug K', provided with a gradually-decreasing opening K<sup>2</sup>, closed at its inner end by a spring-valve K<sup>3</sup>, secured to the plug K', as plainly indicated in Fig. 5, the said spring-valve K<sup>3</sup> opening inward into the passage D.

The operation is as follows: The water entering the inlet B is slowed down by the action of the increase in the size of the said inlet, thus admitting a slower motion of the water at the waste-valve C. The retarding action of the inlet B on the power-water has also a tendency to draw down the water in the passage D, thus assisting in drawing in air through the snifter-valve K. When the waste-valve C closes, the water is driven past the discharge-valve F into the bell E and through the opening H into the discharge-chamber I and pipe J while the discharge-valve is dropping, and a backward motion is given to the water column in the passage D by the pressure in the air-bell E. After the discharge-valve F has arrived at its seat air is drawn into the passage D and the snifter-valve K. Thus by the arrangement described sufficient air is supplied for all needs and purposes of the ram for elevating water, and at the same time a surplus is obtained for other outside purposes, if desired.

It is understood that the screw-rod G for limiting the upward movement of the discharge-valve F permits of setting the ram



when working under different heads of water and ratios of lifts and also when starting the machine under a high ratio between the head and the lift. It is understood that the higher the ratio the closer the discharge-valve F must be held to its seat by the screw-rod G. The cone F<sup>2</sup> on the under side of the valve F permits of an easier settling of the valve through the column of water, it being understood that a cone C' is also arranged on the waste-valve C, and this cone has the same function as the cone F<sup>2</sup> on the discharge-valve F.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A hydraulic ram, comprising a ram-body having an inlet gradually increasing in size, a waste-valve at the larger end of the inlet, a column or passage leading upward from the inlet, a discharge-valve at the upper end of the passage, a discharge-chamber at one side of said passage, an air-bell over said upwardly-extending passage and discharge-chamber, said chamber opening at its top into the air-bell, a rising flange or rim surrounding the opening at the top of said discharge-chamber, and a discharge-pipe for carrying the water to its place of use, as set forth.

2. A hydraulic ram, comprising a ram-body having an inlet gradually increasing in size, a waste-valve at the larger end of the inlet, a column or passage leading upward from the inlet, a discharge-valve at the upper end of the passage, a discharge-chamber at one side of said passage, an air-bell over said passage and discharge-chamber, said chamber opening at its top into the air-bell, a rising flange or rim surrounding the opening at the top of said discharge-chamber and extending above the top of said upwardly-extending passage, a discharge-pipe for carrying the water to its place of use, and a snifter-valve in said upwardly-extending passage, as set forth.

3. A hydraulic ram comprising a ram-body having an inlet gradually increasing in size, a waste-valve at the larger end of the inlet, a column or passage leading from the inlet, a discharge-valve at the end of the passage, an air-bell over the discharge-valve, a discharge-chamber into which opens the said air-bell and from which leads a discharge-pipe for carrying the water to its place of use, and a water-retaining ring or flange around the opening between the air-bell and the said discharge-chamber, as set forth.

4. A hydraulic ram comprising a ram-body

having an inlet gradually increasing in size, a waste-valve at the larger end of the inlet, a column or passage leading from the inlet, a discharge-valve at the end of the passage, an air-bell over the discharge-valve, a discharge-chamber into which opens the said air-bell and from which leads a discharge-pipe for carrying the water to its place of use, said discharge-chamber being at one side of the upwardly-extending column and above the inlet-passage and having an annular flange around its opening in the air-bell, said flange extending upwardly slightly above the lower edge of said valve to form a water seal therefor, and a regulating device for limiting the rising movement of the said discharge-valve, as set forth.

5. A hydraulic ram, comprising a ram-body having a chamber divided into two compartments, a larger and a smaller, an air-bell over the top of said chamber, an inlet in the bottom of said chamber gradually increasing in size, a waste-valve at the inner end of the inlet, the smaller compartment of said chamber opening at its bottom into said inlet, and having a discharge-valve at its top, the larger compartment forming a discharge-chamber closed at its bottom and opening at its top into the air-bell, and having a discharge-pipe for carrying the water to its place of use, as specified and for the purpose set forth.

6. A hydraulic ram, comprising a ram-body having a chamber divided into two compartments, a larger and a smaller, an air-bell over the top of said chamber, an inlet in the bottom of said chamber gradually increasing in size, a waste-valve at the inner end of the inlet, the smaller compartment of said chamber opening at its bottom into said inlet and having a discharge-valve at its top, the larger compartment forming a discharge-chamber closed at its bottom and opening at its top into the air-bell and having a water-retaining ring or flange around said opening, the top of said flange being in a plane above the bottom of the air-bell and also above the seat of the discharge-valve, said discharge-chamber having a discharge-pipe for carrying the water to its place of use, as specified and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERBERT CULPAN.

Witnesses:

D. S. MCLEAN,  
R. L. SABIN.