

No. 753,560.

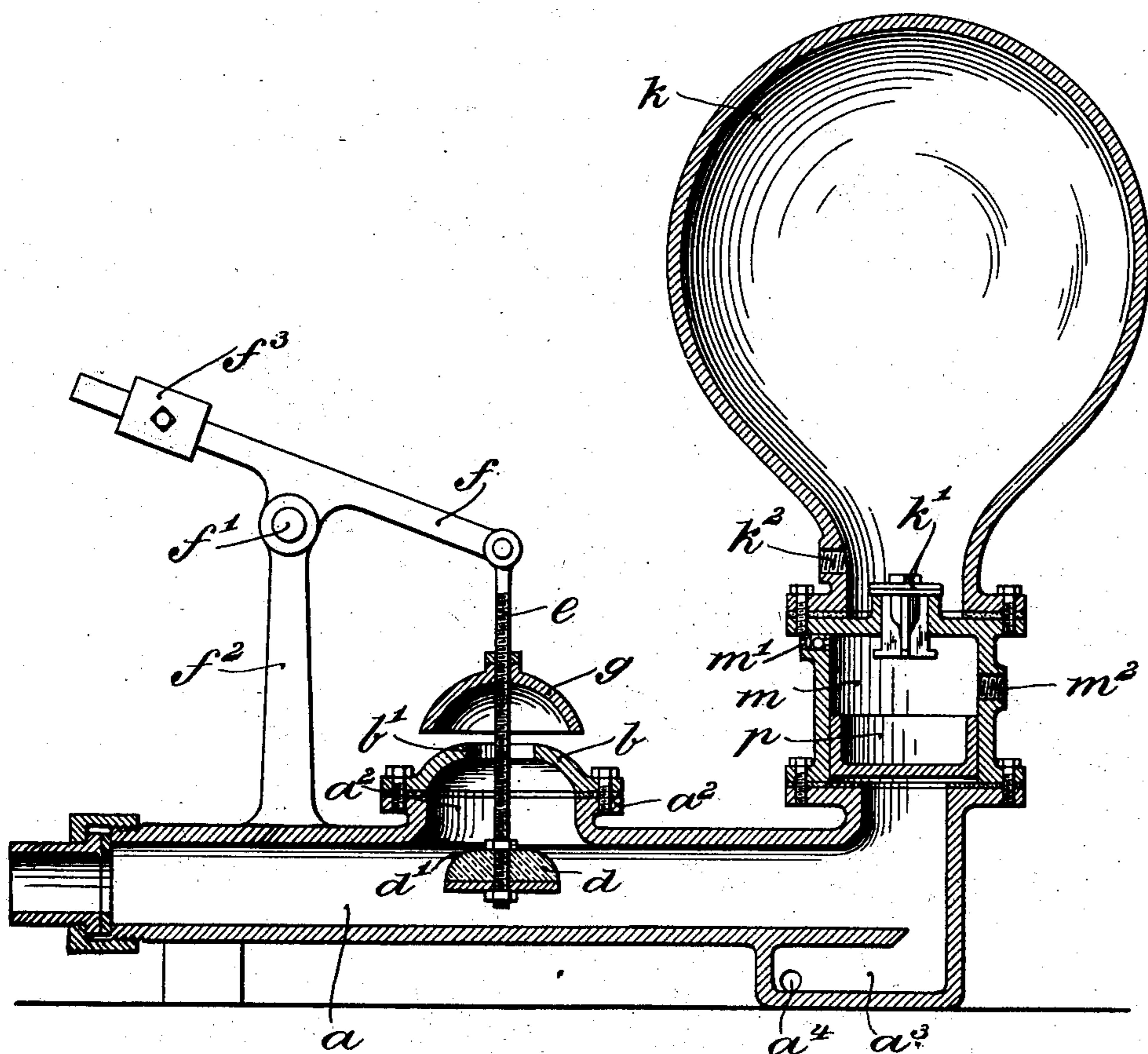
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HYDRAULIC RAM.

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NO MODEL.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC RAM.

SPECIFICATION forming part of Letters Patent No. 753,560, dated March 1, 1904.

Application filed April 27, 1903. Serial No. 154,538. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. EARLE, Jr., residing at Bryn Mawr, in the county of Montgomery, and GEORGE B. SHAINLINE, residing at Wayne, in the county of Delaware, State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Hydraulic Rams, of which the following is a specification.

Our invention has relation to a hydraulic ram, and in such connection it relates to the construction and arrangement of parts constituting such a ram. In devices of this class, wherein the flow of a stream of water into the ram was depended upon to elevate the water from the source of supply into a container or reservoir and to maintain the water in the container or reservoir under pressure, it sometimes happened that the flow of water into the ram became impaired and its force so reduced that the plunger-valve upon the intake-pipe could not be operated, and hence no flow or force could be exerted to lift the water into its reservoir.

The principal objects of our invention are, first, to so construct and rearrange the plunger-valve of the intake-pipe that it may be readily adjusted according to the flow of water into the intake-pipe, whereby upon a diminution of said flow the plunger-valve may still be operated to close the outlet from the intake-pipe and to permit the inflowing water to deliver its blow upon the ram proper, and, second, to so reconstruct and rearrange the water-lifting valve in the air-chamber of the ram proper as to utilize to the fullest extent the lifting power from the blow of the inflowing water and to minimize the tendency of the water-lifting valve to become impaired, disarranged, or broken.

The nature and scope of our invention will be more fully understood from the following description, taken in connection with the accompanying drawing, forming part hereof, and which illustrates in longitudinal section a hydraulic ram embodying main features of my present invention.

Referring to said drawing, *a* represents the intake-pipe, into which the water from a brook,

stream, or impure source flows. Upon the pipe *a*, intermediate of its inlet and discharge ends, is formed a seat *b*, of preferably oval shape, having a central opening *b'* of circular outline. The seat *b* may be of brass or other suitable material and is bolted or otherwise secured to a flange *a'* upon a correspondingly-shaped opening in the pipe *a*. The flanged opening *a'*, seat *b*, and opening *b'* in the seat constitutes an outlet or overflow for the impure water in the pipe *a* during its reflex movement in said pipe *a*. A plunger *d*, shaped to fit the interior of the seat-plate *b* and having an upper surface *d'*, adapted to bear against and to close the opening *b'* in said seat *b*, is suspended from a rod *e*, preferably screw-threaded at its upper end and traversing the opening *b'* of the seat *b*, so as to hold the plunger *d* within the pipe *a* below the seat *b*. The rod *e* is made, preferably, of metal and depends from one end of a lever or arm *f*, which is supported in a fulcrum *f'* intermediate of its ends by means of a bracket or standard *f''*, preferably supported by the pipe *a*. On the free end of the lever *f* is a movable or adjustable counterweight *f'''*. The fulcrum *f'* of the lever *f* is arranged eccentrically on the standard *f''*, so that the end from which the rod *e* is suspended is normally in a lower position than the counterweight *f'''*. This arrangement insures the lowering of the plunger *d*, and hence the opening of the seat *b*, when the plunger *d* is not elevated by the intruding water in the pipe *a*. Arranged upon the rod *e* above the seat *b* is a plate *g*, preferably bell-shaped, adapted to be adjusted up and down upon the rod *d* to either approach the opening *b'* in the seat *b* or to recede therefrom. The water escaping from the seat *b* is adapted to strike this plate *g* with varying force, according to the distance the plate *g* is above the seat *b* and according to the force of the water flowing into the pipe *a*. The plate *g* acts as a governor and enables the plunger *d* to drop below current or flow of water. By moving the governor-plate *g* up or down upon the rod *d*, according to the variations in the flow of water into the pipe *a*, there will be secured an upward thrust upon the governor-

plate g , thereby raising the plunger d to enable it to seat itself in the seat b . Thus if the force of the water in the pipe a is insufficient to lift the plunger d then the plate g is advanced on the rod e toward the seat b until the force of the escaping water exerted upon the governor-plate g assists in lifting the plunger d properly to the seat b .

The reservoir or container k , wherein water under pressure is to be stored, has at its base a check-valve k' , arranged to permit water and air to be forced from the spring-water chamber m into the reservoir k and to prevent a return of water from said reservoir k into said spring-water chamber m . The chamber m is formed of metal and in one of its walls is arranged a check-controlled air-inlet m' . The chamber m has also an inlet m^2 for spring or pure water. Within the chamber m is closely fitted a box-shaped valve p , of metal or rigid material. The sides of the box-valve p are so arranged that when the valve-box p is raised its sides cut off or close the water-inlet m^2 and the air-inlet m' . The box-valve p normally closes the discharge end of the inlet-pipe a , and when water flows into said pipe a with the plunger d closed it delivers upon the base of the box-valve p a blow sufficient to raise the box-valve p and to force the water in the chamber m under pressure into the reservoir or container k . The water from the reservoir k is led away through an opening k^2 to the place where the water is to be used. In the base of the pipe a is arranged a catch-basin a^3 , into which dirt or sediment may fall and from which it may be removed through a valve-controlled opening a^4 .

Having thus described the nature and objects of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a hydraulic ram, a spring-water chamber provided with a water-inlet and an air-inlet, a reservoir arranged above said chamber and having a valve-controlled inlet, a box-

shaped valve arranged within said chamber, an intake-pipe arranged below the base of the valve of said chamber and having between its inlet and discharge an overflow-opening provided with a seat, a plunger-valve adapted to engage the seat of said opening, a rod traversing the seat and opening and carrying said plunger-valve, a lever-arm from one end of which said rod is suspended, and a bell-shaped governor-plate adjustable on said rod toward or away from said seat.

2. In a hydraulic ram, a spring-water chamber, an inlet for water to said chamber, an air-inlet for said chamber, a reservoir arranged above said chamber, a valve-controlled inlet arranged to permit water to flow only from the chamber into the reservoir, a box-shaped valve arranged within the chamber, said valve formed of rigid material, and an intake-pipe arranged below the base of said valve so that the inflowing water may strike upon said base.

3. In a hydraulic ram, an intake-pipe having an overflow-opening and a delivery end, a plunger arranged within the pipe and adapted when elevated by the water in the pipe to close the overflow-opening, a governor-plate cooperating with the plunger and arranged outside the pipe above the overflow-opening, means for adjusting said plate toward or away from the overflow-opening, a spring-water chamber arranged above the delivery end of the pipe, and a box-shaped valve of rigid material arranged in said chamber, the base of said valve normally resting upon the delivery end of said intake-pipe.

In testimony whereof we have hereunto set our signatures in the presence of two subscribing witnesses.

GEORGE H. EARLE, JR.
GEORGE B. SHAINLINE.

Witnesses:

EVA S. HAYMAN,
JAMES WARK.