

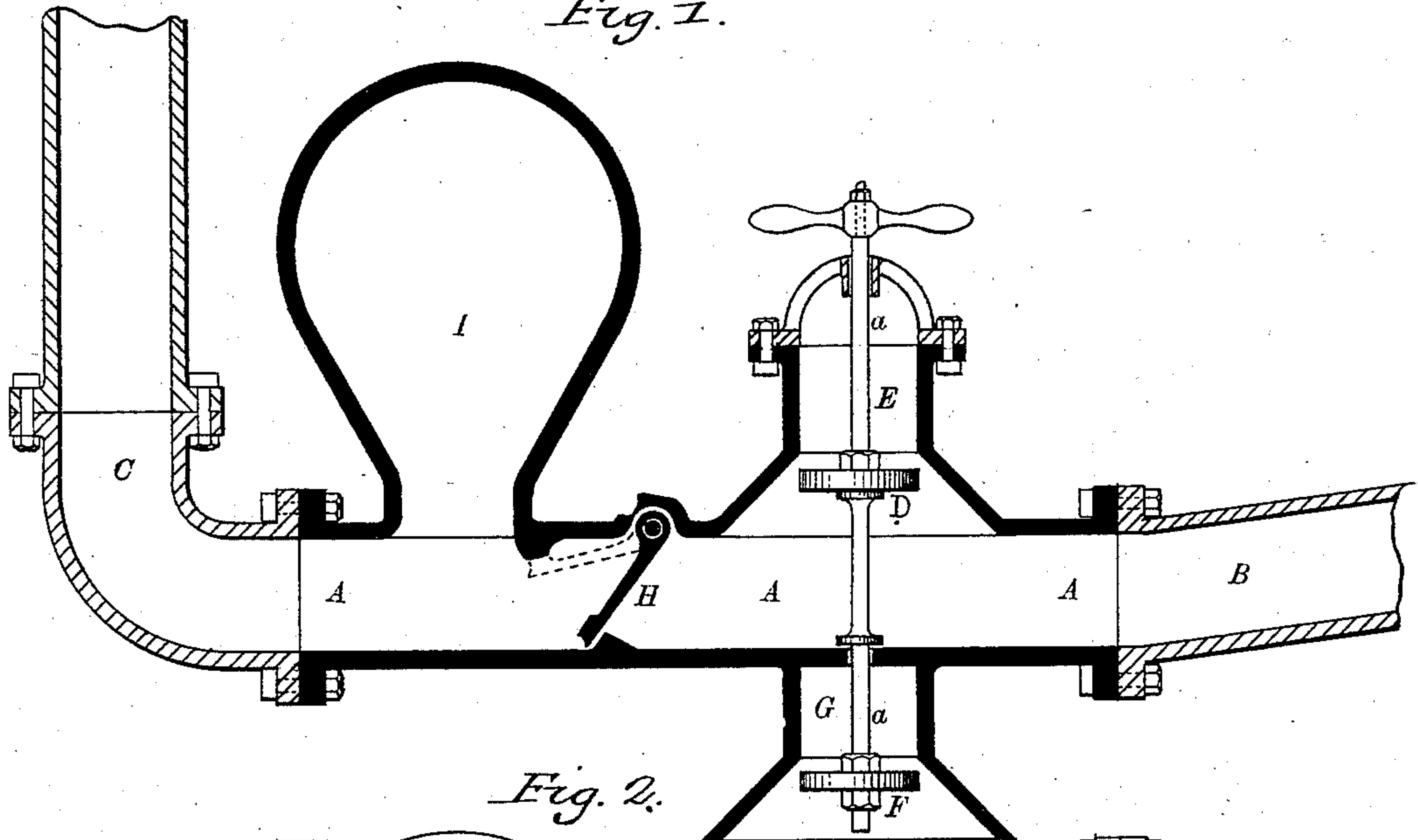
(No Model.)

G. YELLOTT.  
HYDRAULIC RAM.

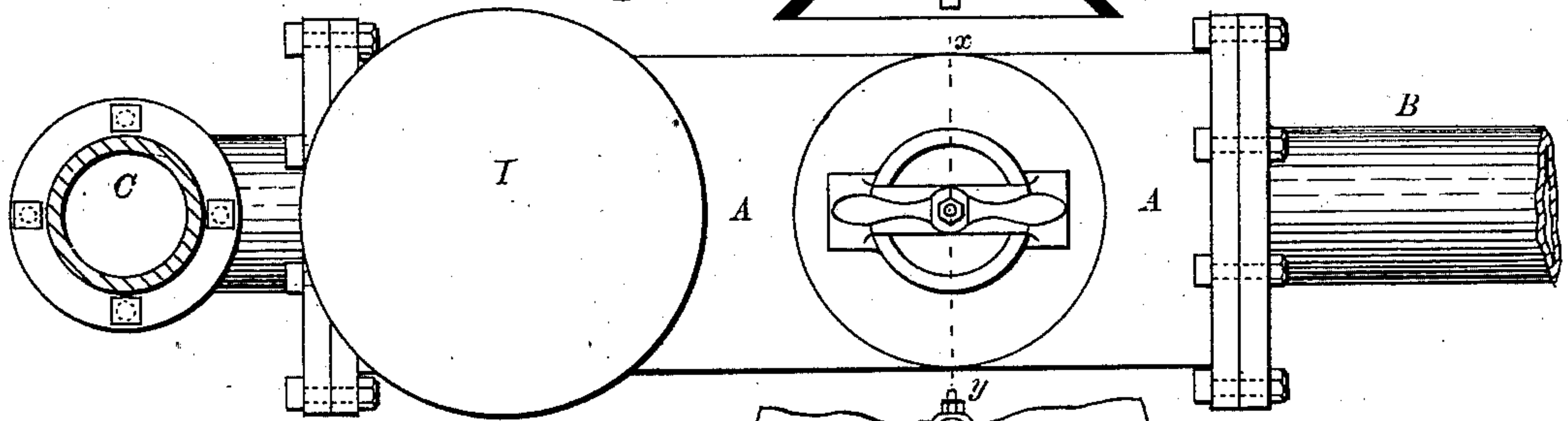
No. 281,749.

Patented July 24, 1883.

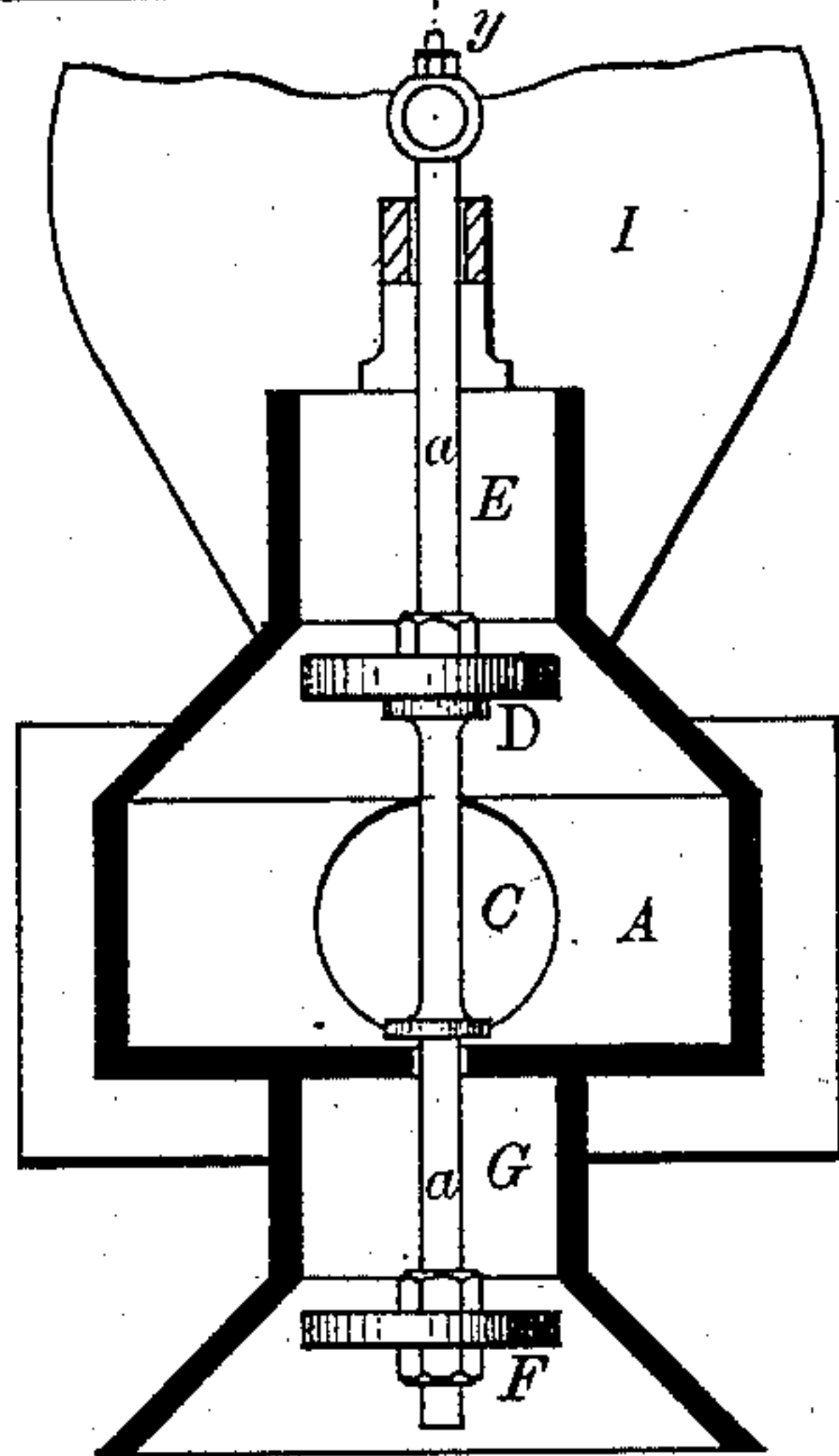
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



- WITNESSES -

Danl Fisher

Chas B. Cassidy

- INVENTOR -

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by G. H. H. Howard  
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# UNITED STATES PATENT OFFICE.

GEORGE YELLOTT, OF TOWSON, MARYLAND.

## HYDRAULIC RAM.

SPECIFICATION forming part of Letters Patent No. 281,749, dated July 24, 1883.

Application filed September 11, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE YELLOTT, of Towson, in the county of Baltimore and State of Maryland, have invented certain Improvements in Hydraulic Rams, of which the following is a specification.

To fully understand the nature of my present invention it must be borne in mind that water moving through the drive-pipe of a hydraulic ram and completely filling it acts like a solid body, and that the power of the apparatus is limited only by the length of the pipe, the velocity of the moving body of water, and the strength of the materials.

The capacity of a Montgolfier ram is necessarily limited, in view of the main valve closing with a sudden collision against a solid substance—namely, the material surrounding the valve-opening which constitutes the valve-seat.

In my invention, as hereinafter described, the collision of the valve and seat is prevented; and in view of this a ram can be constructed to work satisfactorily, of any size or capacity, and a large body of water elevated as easily as a small one.

In carrying out my invention I provide the ram-chamber with, preferably, a cylindrical outlet-pipe, and construct a piston-valve to be automatically moved from within the ram-chamber to the said outlet-pipe, its first position allowing of the escape of the water entering the said chamber, and the second preventing this escape and obliging the water to pass the said valve toward the air-vessel and delivery-pipe. To the stem of the piston-valve I secure a second piston, and provide the ram-chamber with a supplemental chamber, into which the second piston enters and compresses air as the first piston ascends and cuts off the waste or outflow of water. By this means the first-named piston is cushioned by compressed air, which, in its expansion, re-establishes the outflow of water—a necessary step to effect a second operation of the ram. In the air-compressing operation a small portion of air escapes at each stroke of the compressing-piston around its stem to the water in the ram-chamber, and passes thence to the air-vessel, thereby obviating the necessity of what is termed a “sniffing-valve.”

In the further description of my invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure I is a longitudinal section of the improved ram. Fig. II is a plan of the invention. Fig. III is a transverse section taken on dotted line *xy*, Fig. II.

Similar letters of reference indicate similar parts in all the views.

A is the ram-chamber, and B and C, respectively, the drive and delivery pipes.

D is a piston-valve secured to a stem, *a*, suitably guided, and adapted to slide from the chamber A to an open cylinder, E.

On the lower end of the stem *a* is a similar piston-valve, F, adapted in its upward movement to compress air in the chamber G.

H is the delivery-valve, of ordinary description, and I an air-chamber of common construction.

Supposing the movable parts of the apparatus to be relatively situated as shown in Fig. I, water passing down the drive-pipe B into the ram-chamber A at first escapes around the valve D; but almost immediately the means of escape of water is cut off by the passage of the valve D into the cylinder E. In the movement of the piston-valve D air is compressed by the valve F in the chamber G and all shock or jar of the moving mechanism prevented. After the pressure in the air-vessel is raised sufficiently to overcome further admission of water to the said vessel, the valves D and F assume their first positions by the expansion of the air in the chamber G, and the ram operation is repeated.

It will be understood that a small quantity of compressed air passes around the stem *a* to the chamber A, and thence to the air-vessel, at each stroke of the valves, to maintain the requisite bulk of air in the said vessel.

I do not limit myself to any peculiar shape of the various chambers and valves; but for convenience in construction I prefer, except in the case of the ram-chamber, a cylindrical form.

In addition to the purposes for which a hydraulic ram is generally used—namely, as a stationary device for elevating water—I propose to employ my improved ram as a portable appa-



ratus for extinguishing fires. To admit of this use the device would be provided with wheels or placed on a wheeled truck, whereby it could be transported and connected to a fire-plug.

- 5 In such use of this invention the water-main, or a link of hose connecting the device to the plug, would constitute the drive-pipe, and the ordinary hose now used as the delivery from the fire-engine could be substituted for the  
10 pipe C shown in the drawings. In cases where there is ample water-supply the ram would prove an efficient fire-engine.

I claim as my invention—

1. In a hydraulic ram, the valve around  
15 which the water passes in its escape, and which is closed by the movement of the escaping wa-

ter, combined with an air-compressing valve and an air-chamber, the said air-compressing valve operating to form an elastic cushion for the outflow-valve, and thereby preventing 20 shock or jar in the operation of the ram, substantially as specified.

2. In combination with the chamber A, the outlet pipe or cylinder E, and compressed-air chamber G, the valves D and F, connected by 25 the stem *a*, and adapted to operate substantially as specified.

GEO. YELLOTT.

Witnesses:

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H. C. BURKE,  
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