

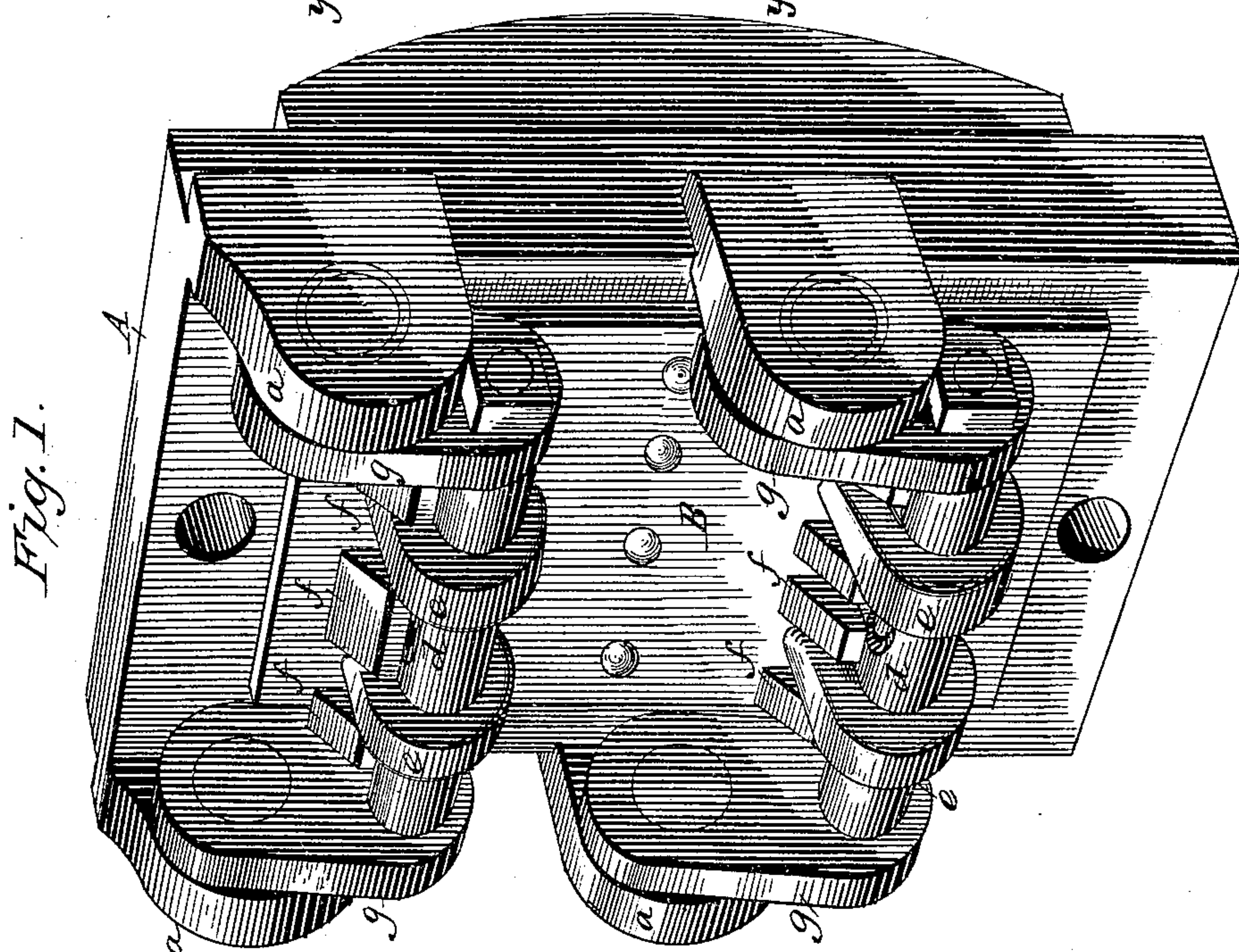
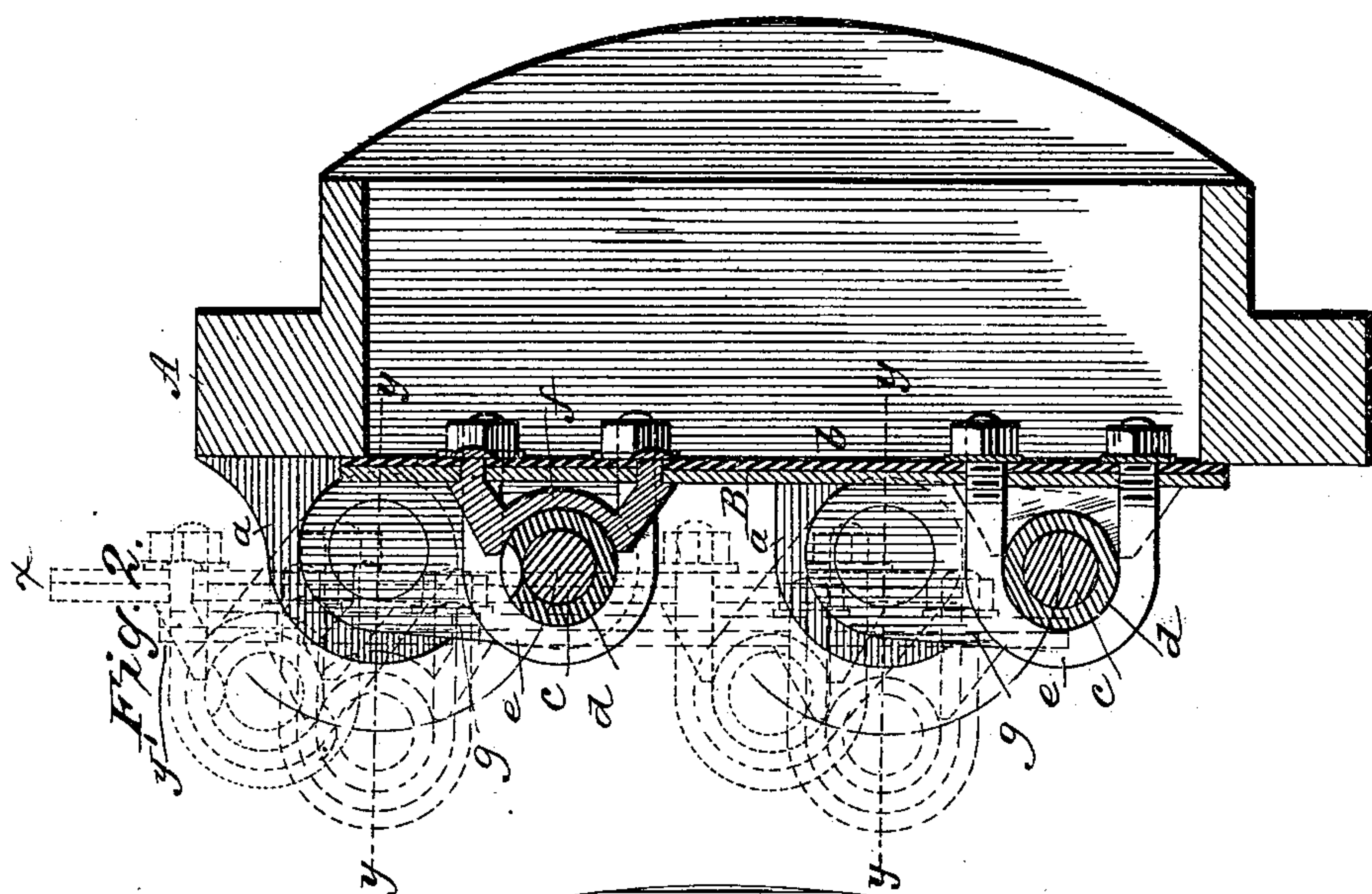
(No Model.)

2 Sheets—Sheet 1.

P. L. WEIMER.
VALVE FOR PUMPS.

No. 353,997.

Patented Dec. 7, 1886.



WITNESSES
Fred G. Dieterich
Wm E. Dyce

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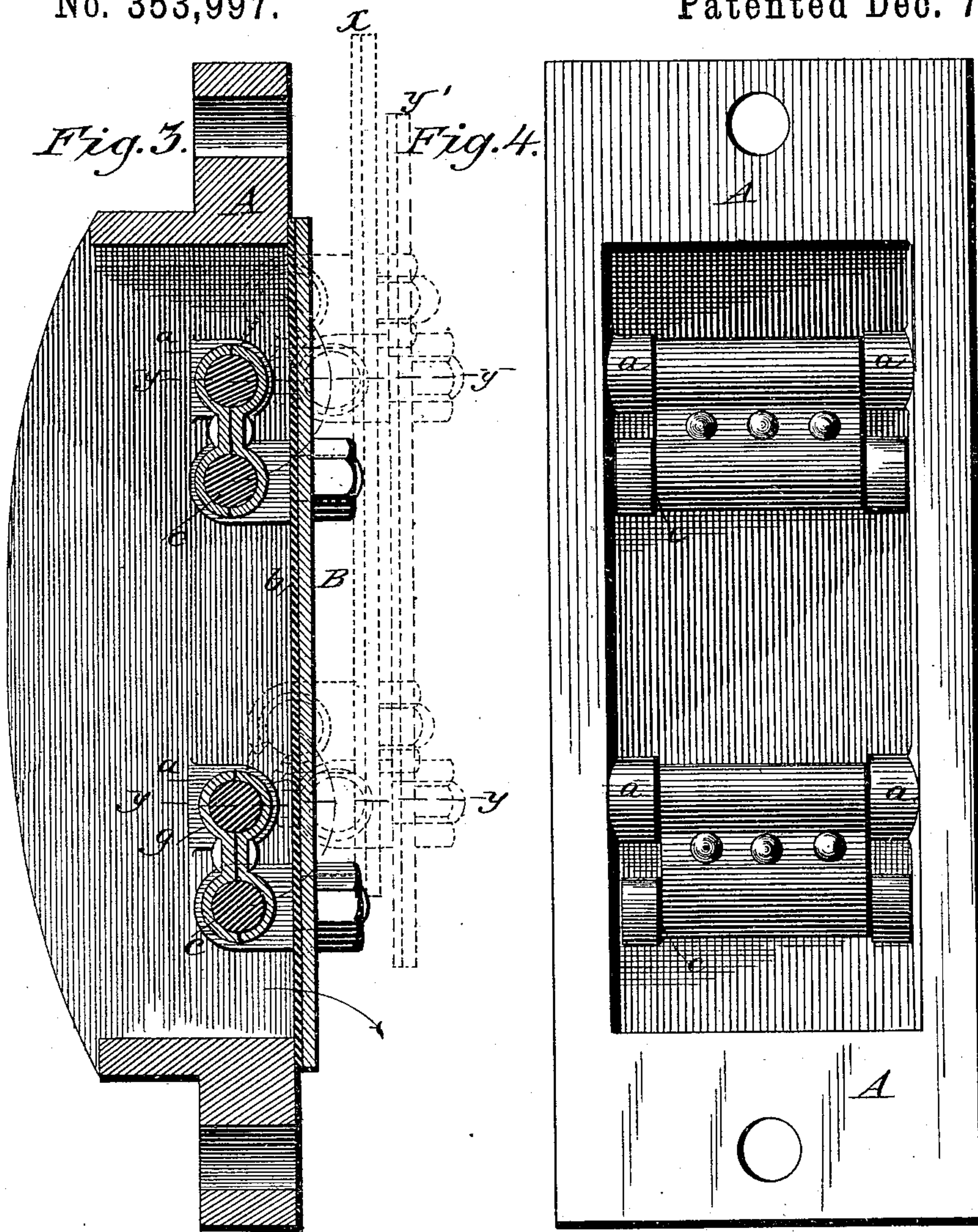
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UNITED STATES PATENT OFFICE.

PETER L. WEIMER, OF LEBANON, PENNSYLVANIA.

VALVE FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 353,997, dated December 7, 1886.

Application filed October 12, 1886. Serial No. 216,024. (No model.)

To all whom it may concern:

Be it known that I, PETER L. WEIMER, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Valves for Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to valves for pumps, and has for its object the construction of a valve which will operate without "pounding" or clattering.

Pump-valves as ordinarily constructed have of necessity a greater area on the back of the valve than on the face which is exposed to the pressure of the liquid or fluid being pumped through them. Therefore the pressure on the face side of the valve must be greater than the pressure in the discharge chamber, pipe, or reservoir to which it is connected, in order to overcome the difference in the area of the two sides of the valve. This increase of pressure operating upon the face of the valve causes it to open with considerable force and velocity, particularly when fluids are being pumped, and raises the valve from its seat to an extent greater than is necessary to secure the full area of the valve-opening.

In order to arrest the momentum of the valve, such devices as buffers or stops, either with or without springs, or springs only, have been employed, as stops of some kind must be employed to limit the valve to its proper lift. The solid buffer is soon destroyed; hence springs have been generally adopted. In practice, however, it is found that they are subject to a very serious objection, for the reason that when the valve opens very quickly under pressure the spring is compressed to such an extent that its resiliency returns the valve toward its seat with such force as to cause it to again rebound and produce what is called a "clatter," which is not only very destructive to the valve and its seat, but objectionable on account of the offensive noise produced.

My invention consists in the construction of

a valve, as will hereinafter be described and claimed, by which the foregoing objectionable features to the ordinary valve are completely overcome, as has been demonstrated by the practical use of my valve.

In the accompanying drawings, which form a part of this specification, Figure 1 is a perspective of a valve constructed in accordance with my invention. Fig. 2 is a vertical section. Fig. 3 is a vertical section of a modified construction; and Fig. 4 is an inverted plan view thereof.

Reference being had to the drawings, and the letters marked thereon, A represents a valve-seat provided with projecting lugs *a a a*, arranged on opposite sides.

B is the valve, which consists of a rectangular piece of metal having an elastic face, *b*, secured thereto. To one side of the valve are pivotally secured shafts or rods *c*, which are incased in a sleeve, *d*, and held in position by staples *e*, while the sleeve is supported in short bearings, *f*, also secured to the valve. The shafts or rods *c* are secured at their ends to links *g*, which in turn are pivotally secured to the lugs *a*, as shown. In the modified construction shown in Figs. 3 and 4 the links are made in two parts, and embrace the shafts or rods which extend across the lower or face side of the valve, and are secured together by rivets.

The valve is arranged in a vertical position, as shown in the drawings, or it may be inclined at an angle to a vertical line.

The operation is as follows: As the liquid or fluid is forced through the valve-opening the valve is raised from its seat and travels in a line parallel with the valve-seat, and at right angles thereto. The momentum acquired by the valve in its travel carries it out from its seat beyond one-fourth of a circle described by the links, into the position shown in dotted lines at *x* in Figs. 2 and 4. From the time the centers of the shafts which cross the valve pass the dotted lines *y y* the valve is cushioned or its momentum arrested by the fluid or liquid passing through the valve-opening, without any shock or jar to the valve. As soon as the valve has been brought to a state of rest in its outward movement it commences to gravitate

toward its seat until it is balanced in the passing current, where it hangs suspended until the pressure of the current diminishes, when it will gradually gravitate to its seat as the
5 piston of the pump reaches the end of its stroke, and will be cushioned by the passing liquid throughout its entire return-stroke, and will seat itself without jar or noise.

It will be observed that in its travel the
10 valve is changing its position with reference to its seat from the beginning to the end of its stroke, and one end passes the opening in the seat, as shown in the dotted lines at y' in Figs. 2 and 4, where the overhanging portion of the
15 valve is directly in the current of the passing fluid or liquid, while the opposite end of the opening is unobstructed.

In the construction shown the weight of the valve when closed is supported by the links g ,
20 and bears upon its seat so lightly that very little pressure is required to start it from its seat; but in its travel its speed is so great that the momentum carries it beyond the horizontal line of the links and cushions upon the
25 passing current of fluid or liquid.

Other forms of the valve and various ways

of connecting it to the seat will suggest themselves to the skillful mechanic or engineer, and I do not therefore limit my invention to the special forms shown. 30

Having thus fully described my invention, what I claim is—

1. A valve suspended upon and supported by swinging links secured to the valve and its seat, and limited in its lift from the seat by
35 said links without the use of positive stops or buffers, substantially as described.

2. A suspended valve having links and pivotal connections with its seat on both sides of its longitudinal center and on both sides of
40 the valve, whereby the valve is caused to travel in a plane parallel with and across its seat, is carried beyond the horizontal line of the links, and is cushioned by the fluid in opening and closing, substantially as described. 45

In testimony whereof I affix my signature in presence of two witnesses.

PETER L. WEIMER.

Witnesses:

J. WEIDMAN MURRAY,
SELIM S. PHEMA.