

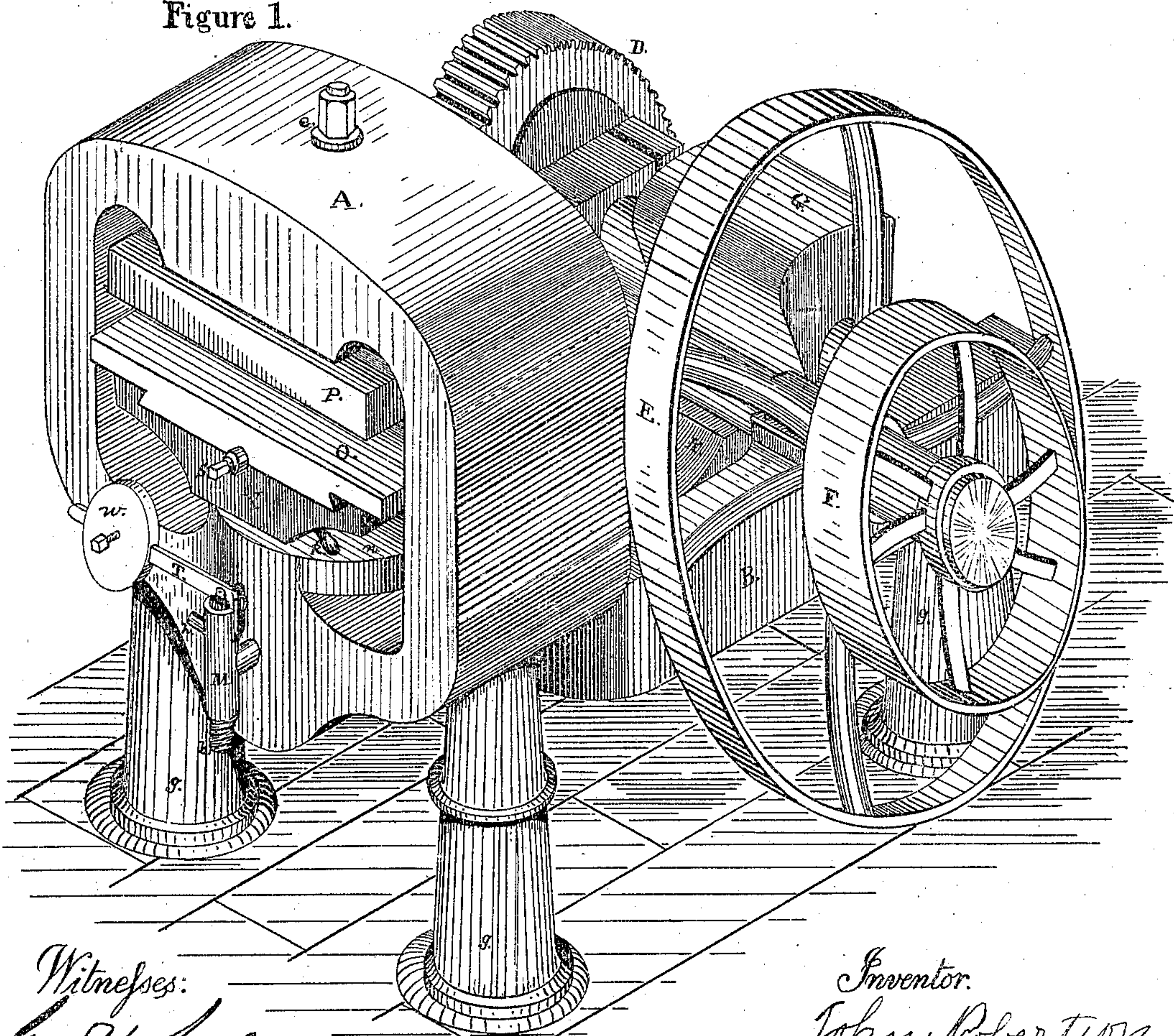
J. ROBERTSON.

Hydraulic Embossing and Compressing Machines.

No. 133,543.

Patented Dec. 3, 1872.

Figure 1.



Witnesses:

Wm. H. Lamborn
Robt. Graham

Inventor.

John Robertson

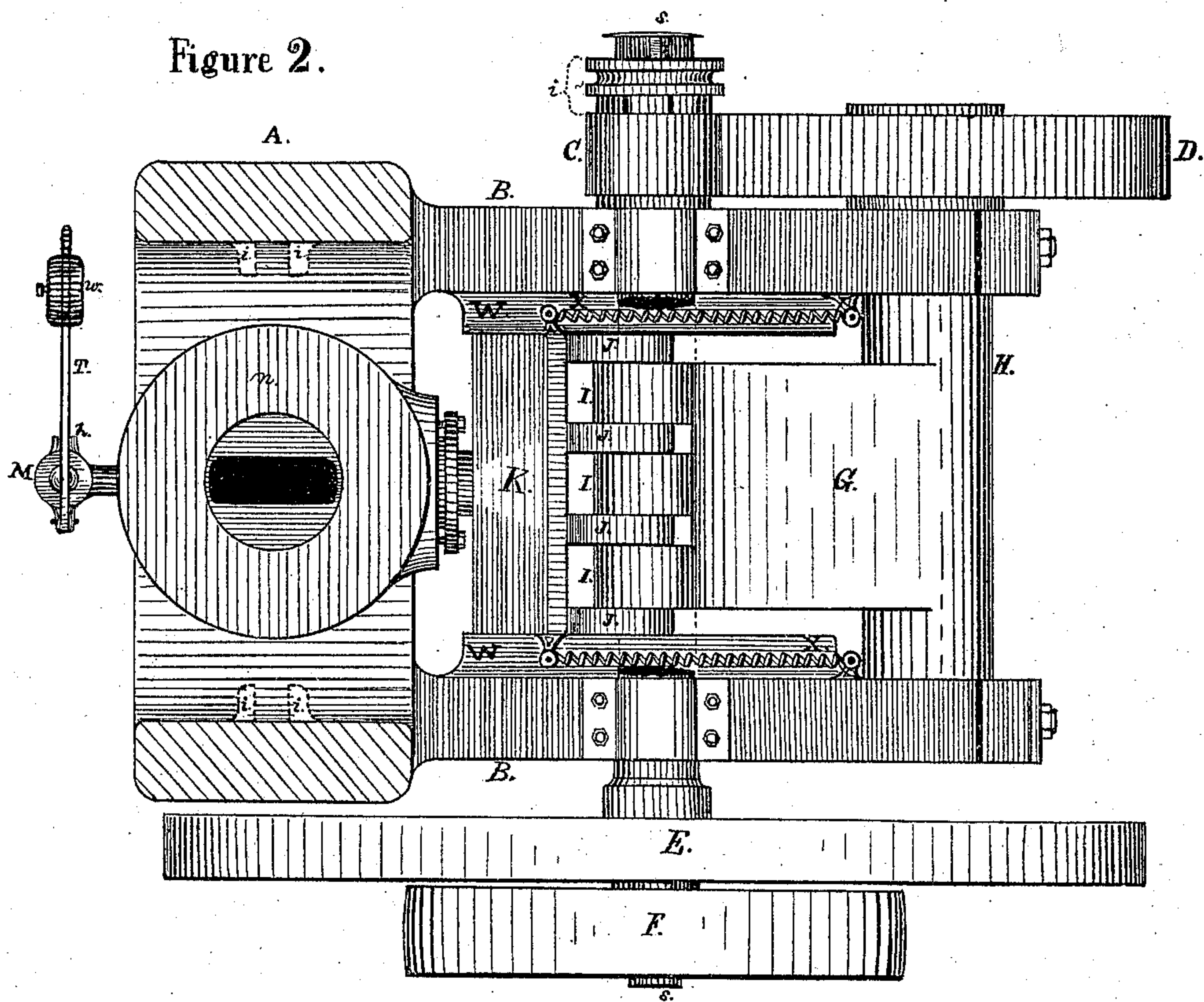
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Figure 2.



Witnesses:

Geo H Lamborn
Robt Graham

Inventor.

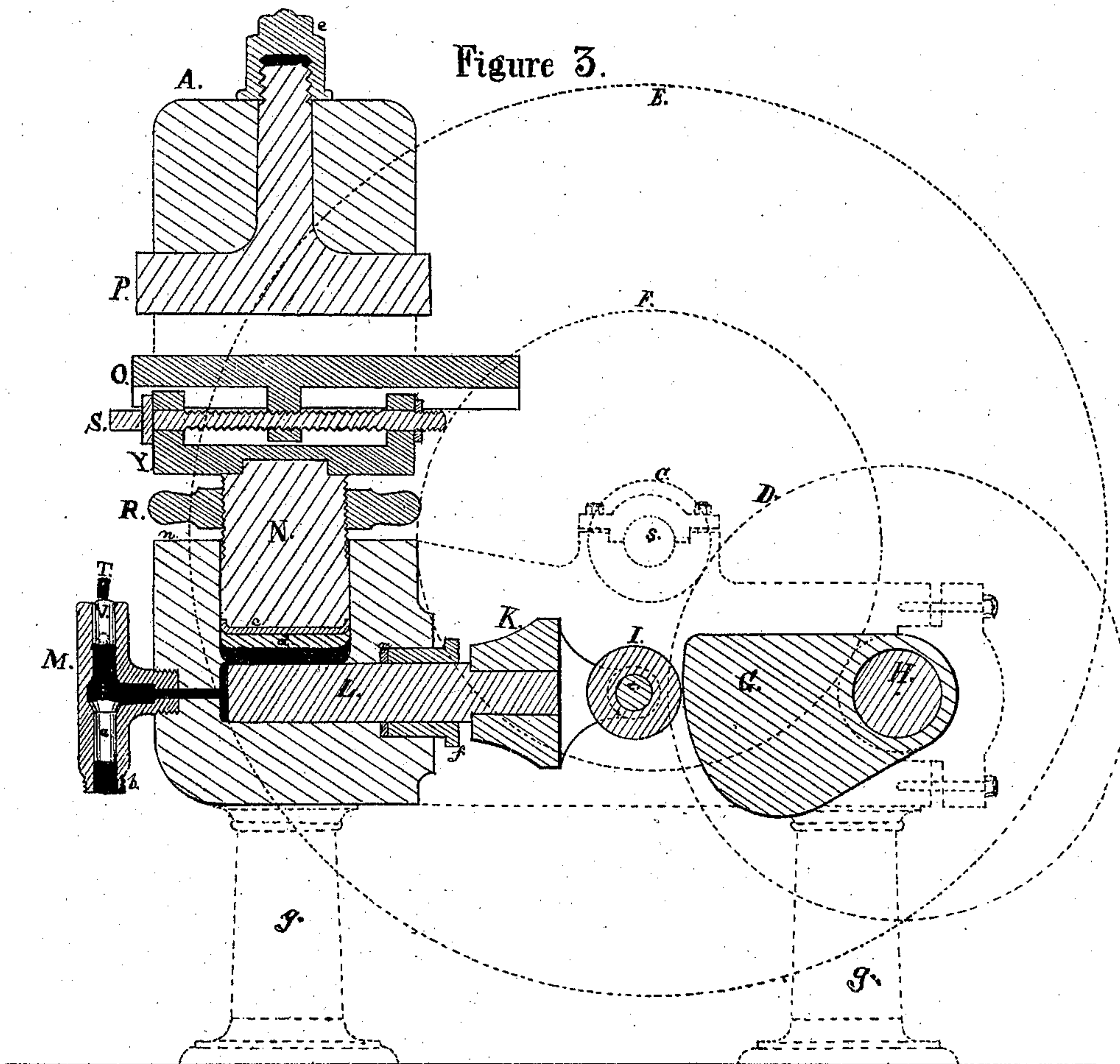
John Robertson

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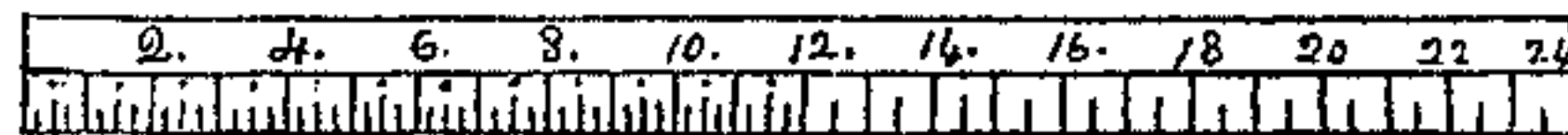
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SCALE of Inches, for Figures 2, 3, & 4.



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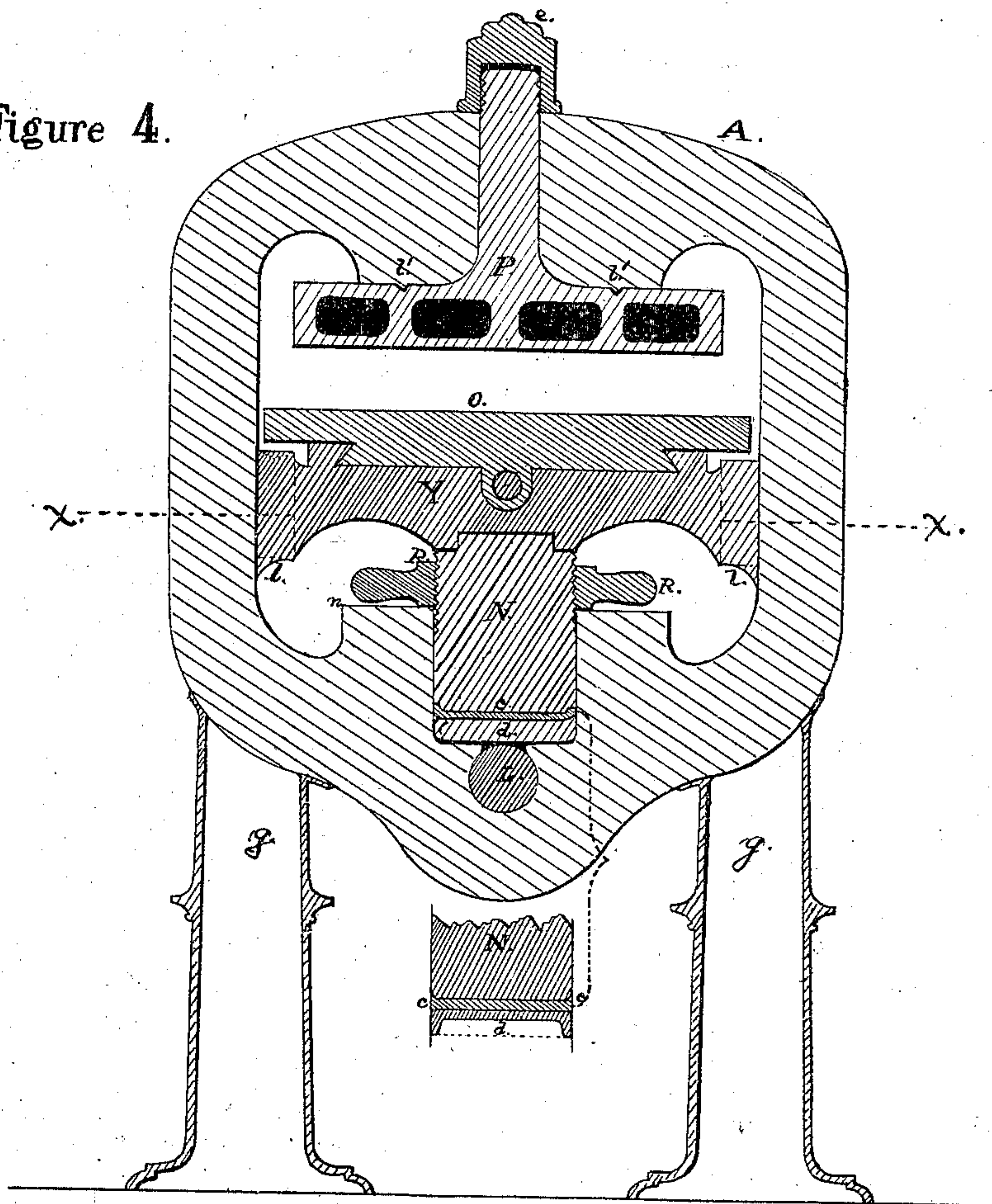
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Figure 4.



Witnesses:
Wm H Lamborn
Robt Graham

Inventor.
John Robertson

UNITED STATES PATENT OFFICE.

JOHN ROBERTSON, OF BROOKLYN, ASSIGNOR OF ONE-HALF HIS RIGHT TO
JOSEPH S. SANBORN, OF NEW YORK, N. Y.

IMPROVEMENT IN HYDRAULIC EMBOSSING AND COMPRESSING MACHINES.

Specification forming part of Letters Patent No. **133,543**, dated December 3, 1872.

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Embossing and Compressing Machines, of which the following is a specification:

My invention relates primarily to embossing and compressing machines arranged to be operated by a hydraulic press of peculiar construction and adaptation combined therewith. Machines of the two classes mentioned have been hitherto constructed to be operated either by the slow-moving hydraulic press and punch, of ordinary construction, or by the toggle-joint moved in the usual manner. The first, though powerful, is slow and otherwise undesirable for this kind of work. The second, though quicker in its action than the former, usually presents difficulties of adjustment, sometimes resulting in breakage of the parts and consequent expense and delay. My invention proposes improvement in both these respects; and the first part of it relates specifically to the devices and combination of devices for making, adjusting, and regulating the impression or the compression. The second part of my invention relates specifically to the combination of mechanism by which the driving-piston is operated by a graduated cam, shaped and every way suited to the work to be performed. The third part of my invention relates specifically to the combination and arrangement of driving-piston operated by a graduated cam with the adjustable or compressing piston and mechanism, so that a strong and quick and at the same time safe action may be secured, the hydraulic plunger or piston being driven horizontally under the adjustable piston moving vertically over it and supporting upon a superimposed table the work to be operated upon, the hydraulic chamber having such a connection with a reservoir of water through a check and safety valve as to discharge the surplus water when the pressure exceeds that desired, and to recharge the same automatically when required; and also the vertical piston being provided with an annular adjusting screw and nut surrounding it, by which its motion may be so controlled as to regulate its drop, and thereby

the amount of water admitted to the hydraulic chamber, and therefore the height to which it will rise, and the impression or pressure given.

Figure 1, Plate 1, is a perspective view of a machine embodying my invention. Fig. 2, Plate 2, is a plan through *a a*, Plate and Fig. 3. Fig. 3, Plate 3, is a side sectional elevation. Fig. 4, Plate 4, is a front sectional elevation.

A is the upright part of the frame; B, its horizontal part; C, a small cog-wheel intended to give motion to the large cog-wheel D, driving the same from the pulley F and its shaft. G is the graduated cam firmly secured on the shaft H or formed on the same. I I I are rollers interknuckled with the projections J J J of the cross-head K, and intended to receive the action of the cam G and transmit the same to the driving-piston L. M is the valve device for discharging or receiving water, as required. N is the vertical piston. O is the table on which the work is laid. P is the upper plate, which receives and resists the pressure from below. R is the regulating screw or nut. S is a screw securing the table O to the cross-head. T is the weighted lever of the safety-valve. V is the safety-valve. W W are guides for the cross-head *k*, and *l l* guides for the cross-head Y. X X are springs for withdrawing the driving-piston L. *a* is the check-valve. *b* is the screw for attaching connection with reservoir. *c* is the piston-packing. *e* is a nut securing the upper plate. *f* is the stuffing-box or gland. *g g* are the legs of the machine. *h* is the escape-pipe connecting with the reservoir. *m* is the packing. *n* is the solid rest for the regulating-nut R.

The operation of my invention and machine is as follows, viz: The motion of the band and spur-wheel and pinion being continued until the cam G falls, the upper edge, Fig. 1, having the most abrupt curve, passes below the center of the rollers I I I, permitting these rollers to take on the straight side thereof. The springs *x x* instantly taking the cross-head *k* in charge withdraw the driving-piston L, attached thereto, as fast as the continuing motion of the cam G will permit, and until the rollers I I I reach the circular or back part of the cam, moving steadily on which, the driving-piston L is left stationary, as well as the table O, in order to give time to place the

work thereon and make any required adjustment of the regulating device. It is perhaps possible to substitute for the cam G a connecting-rod attached at one end to the cross-head K and at the other to a crank-pin on the shaft H, but, if so, I consider the same to be only a defective equivalent, owing to the increased motion given to the piston L and other changes it would introduce. When the driving-piston L has been completely withdrawn the vertical piston will be found to have dropped until the nut R rests upon the flat top *n* of its cylinder. If L has yet some space to travel when the pressure is entirely relieved, no vacuum being allowed to be created in the water-space owing to the adjustment of the parts, as described, the conditions of a suction-pump are established; and upon that travel being made water will be received from the reservoir into the water-space between L and N. The motion of the parts continuing after the material to be operated on has been placed in position, the rollers I I I soon begin to take on the short and curved lower side of the cam G, as shown in Fig. 1, Plate 1, by which the driving-piston is again forced into its cylinder and with increasing power as it proceeds, owing

to the shape of the cam, and upon well-known principles.

I claim as my invention—

1. The effective piston N of a hydraulic press provided with the adjusting or regulating nut R.
2. The driving-piston L of a hydraulic press and the graduated cam G, arranged and operating as described.
3. The combination of the regulated piston N with the driving mechanism of a hydraulic pump provided with check and safety-valves, as described.
4. The driving-piston of a hydraulic press operated by a graduated cam, in combination with its effective piston.
5. The combination of the cam G, the cross-head K, the pistons L and N, the regulating-nut R, the table O, and the plate P, operating and co-operating as described.
6. The combination of the graduated cam G, the friction-rollers I I I, and the piston L, in the manner and for the purposes set forth.

JOHN ROBERTSON.

Witnesses:

GEO. H. SANBORN,
ROBT. GRAHAM.