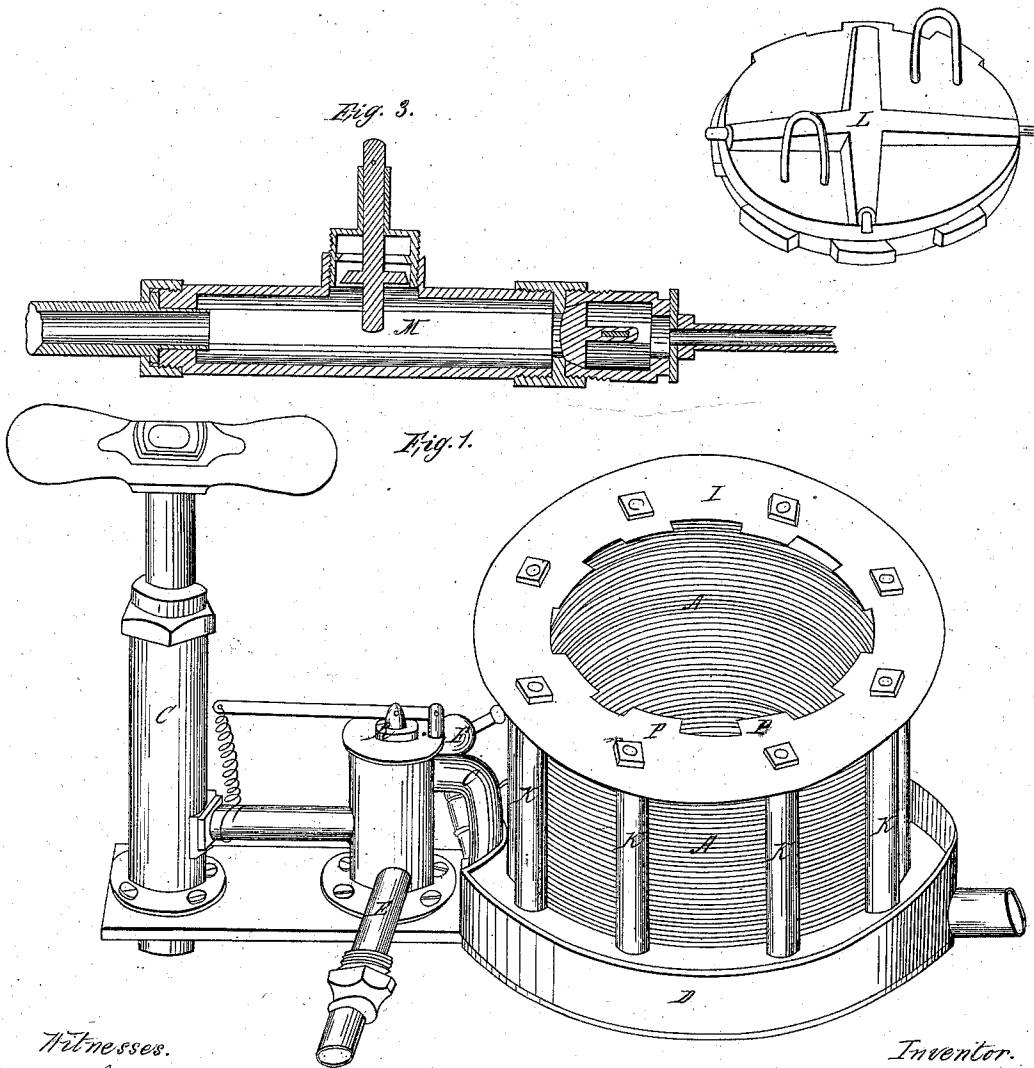


R. Grant,
Hydraulic Press,
N^o 11,455. *Patented Aug. 1, 1854.*



Witnesses.
W. S. Sullivan
J. M. M. M.

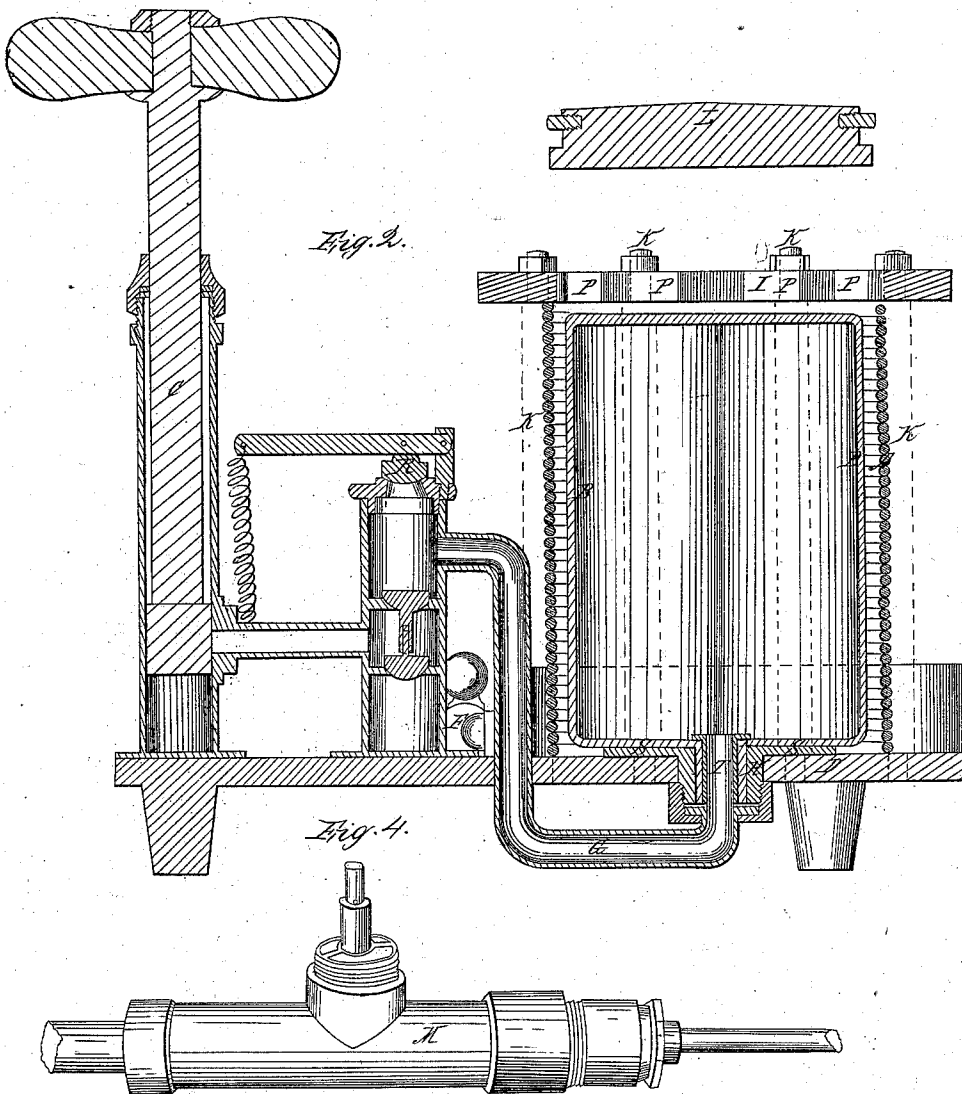
Inventor.
Robert Grant

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Inventor.
Robert Grant

UNITED STATES PATENT OFFICE.

ROBERT GRANT, OF NEW YORK, N. Y.

HYDRAULIC PRESS.

Specification of Letters Patent No. 11,455, dated August 1, 1854.

To all whom it may concern:

Be it known that I, ROBERT GRANT, of the city and county of New York and State of New York, have invented a new and useful Machine for Pressing Substances or Wring-
5 ings Clothes or Squeezing Molasses from Sugar or for any other purposes wherein an equilateral hydraulic power can be servically applied; and I do declare hereby that the
10 following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

15 Figure 1 represents a view in perspective of the machine and Fig. 2 a longitudinal section of the same.

Letter A is a cylinder of galvanized spiral wire, forming the strainer and body of the
20 pressing machine; C, hydraulic pump; B, india rubber bag or flexible diaphragm inside the wire cylinder; D, metallic platform serving also for the bottom of cylinder; E, hydraulic induction pipe; F, eduction pipe;
25 G, curved pipe leading the water from the pump, and attached to the bottom of the india rubber bag or medium by the coupling joint H, Fig. 2; I, metal top attached to the bottom by upright rods K, K, inclosing the
30 spiral wire cylinder, which is thus prevented from being extended; L, concentric section of the metallic top, which serves as a cover to the cylinder, and is kept in a firm position under pressure by lips O, O, O, on
35 the periphery, which are constructed to lock into corresponding lips P P, P, P, on the inner rim of the metallic top; R, safety valves; S, face plate upon the bottom of the india rubber diaphragm, serving as an exterior collar for supporting the tubular
40 mouth of the bag X; T, interior screw pipe, for the mouth of the india rubber bag or diaphragm, and serving as the male junction of the coupling H, leading to the hydraulic pump; Figs. 3 and 4, M, hydraulic
45 ram, used as occasion may require in place of the pump to force water into the india rubber bag or flexible diaphragm. This ram is especially applicable in connection
50 with a permanent head of water, as the ordinary croton head, giving a pressure say of forty pounds to the inch, can be turned directly into the diaphragm or pressure bag, as shown in the Plate 2, and thereby
55 the water can be mostly pressed from clothes, or any other purposes of pressure nearly

effected, the water ram being necessary to be applied only for a short time, at the termination, when the ratio of pressure increases rapidly, with the introduction of a
60 comparatively small quantity of water.

The nature of my invention consists in adopting an india rubber diaphragm, or flexible pressure bag, or water tight medium, to the inside of a vessel of suitable strength,
65 in such manner as to enable the substances required to be pressed, squeezed or wrung to be placed upon the outside of the diaphragm while water, steam, air, or gas is introduced by any means available, upon the other side
70 of said diaphragm, with sufficient force to cause the diaphragm to press upon the material and thrust the same against the opposite perforated sides or top of the vessel, thereby
75 pressing said material into any required shape, or squeezing or wringing from the material such juice, fluid, or liquid as it may contain.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct the body of my cylinder of two circular plates of iron, top and bottom, connected and fastened at convenient distances, by a sufficient number of iron rods,
85 passing through the outer edges thereof, and on the inside of said rods I coil a wire continuously from bottom to top, thus forming a cylindrical helix of wire, surrounding the whole interior surface of the rods, and forming
90 a closely packed wire-cage. In the interior of this cage, I place an india rubber bag of sufficient size to occupy the whole interior area, when distended. A tube from this bag passes through the lower plate, and
95 is connected with the same by a collar of iron surrounding the tube. This tube is connected by a coupling screw to the pipe leading to the hydraulic pump. The bag I cause to be baked or vulcanized in a compressed or collapsed form, which form it
100 naturally retains in the cylinder, when not distended. Between this bag and the extraneous wire-cage, I place the clothes or material required to be pressed, squeezed or
105 wrung and then close the same with a cover, which is inserted and made fast by means of lips inserted through slots in the sides of the opening of the top plate through which the clothes, &c., are introduced. I then
110 force water, air or steam sufficiently compressed into the interior of the india rubber

bag. As the water or compressing medium forces the bag outward, the material to be squeezed, wrung or pressed, is thereby thrust against the extraneous wire-cylinder, where
5 the wire percolates through the interstices, while the solid parts remain within the wire cylinder. The great advantage derived from this mode of pressing consists in the equal adaptation of the flexible bag to every
10 part of the material required to be pressed, thus exerting an equal force upon every part of the compressed surface, however uneven it may be. This quality renders the machine particularly applicable to the pressing
15 of hides, wringing clothes, squeezing molasses from sugar and all other purposes where an equilateral pressure is required.

When either the hydraulic or pneumatic pump is used, I apply power in any convenient manner either by hand or mechanical means. When the hydraulic pressure is used, which I consider as the most efficient and economical, I introduce a small quantity
20 of air into the diaphragm, or flexible pressure bag, to give elasticity to the working of the pump or hydraulic ram. When power
25 is used for giving the hydraulic pressure, I attach a safety valve to the pump or induction pipe between the pump and cylinder.

I do not confine myself to either water, 30 steam, air, or gas as a compressing medium, but use each singly or severally, as the case may require; still I consider the hydraulic pressure decidedly the best.

The flexible diaphragm or medium, or 35 pressure bag, may be formed of india rubber, oil cloth, or leather, or of any water or air-tight material; but I consider vulcanized india rubber cloth as incomparably the best adapted for the required purpose. 40

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of a flexible water and air tight bag or medium of vulcanized india rubber cloth, with an outside wire vessel or
45 its equivalent in such manner as that when water or steam shall be forced into the inside of the bag, the bag or medium shall be thereby pressed outward, and any material
50 contained between the same and the extraneous wire-cylinder shall thus be wrung or squeezed nearly dry, by being pressed against the interstitial sides, as before substantially described, in Figs. 1 and 2.

ROBERT GRANT.

Witnesses:

ROBT. CLANCY,
EDW. DUNN.