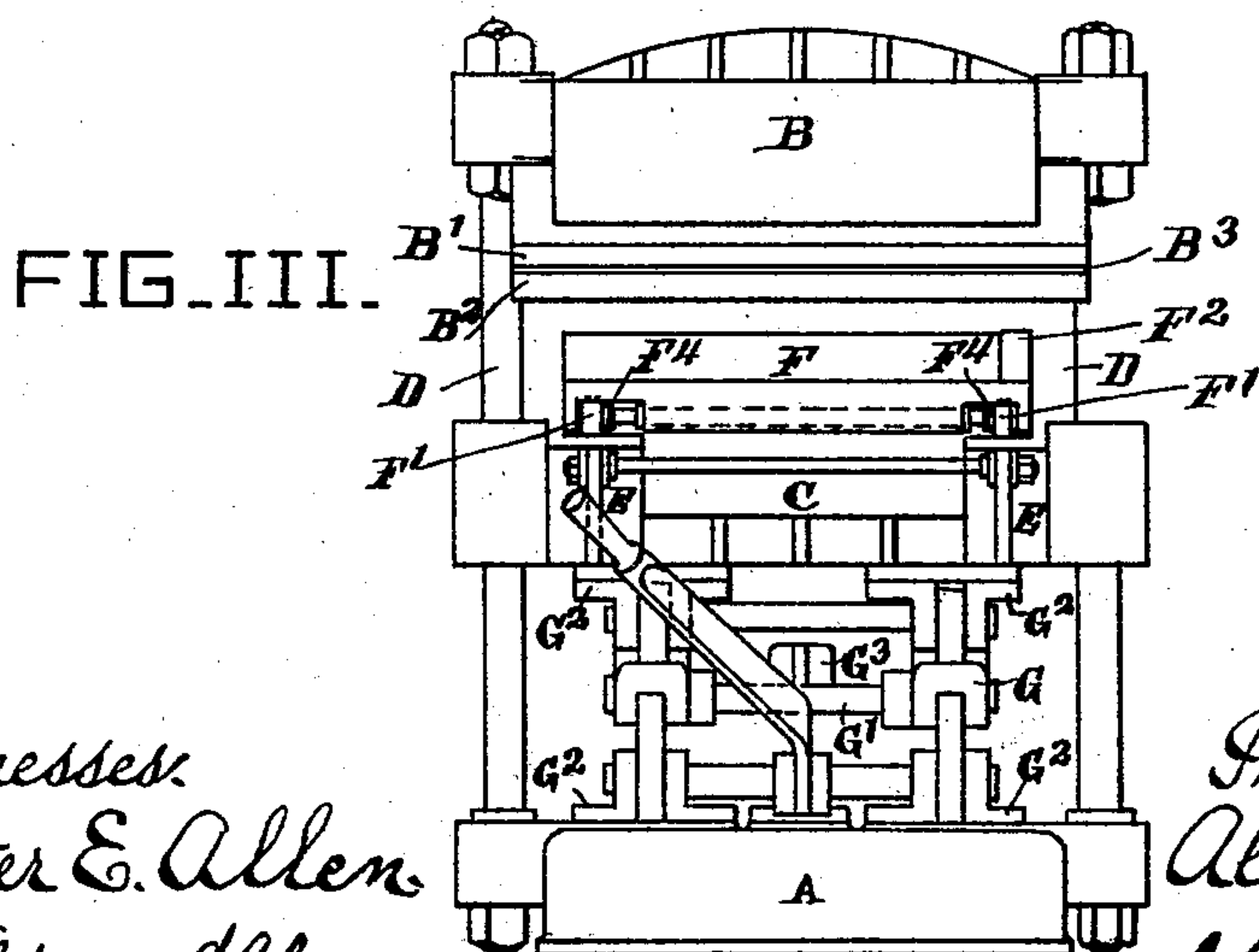
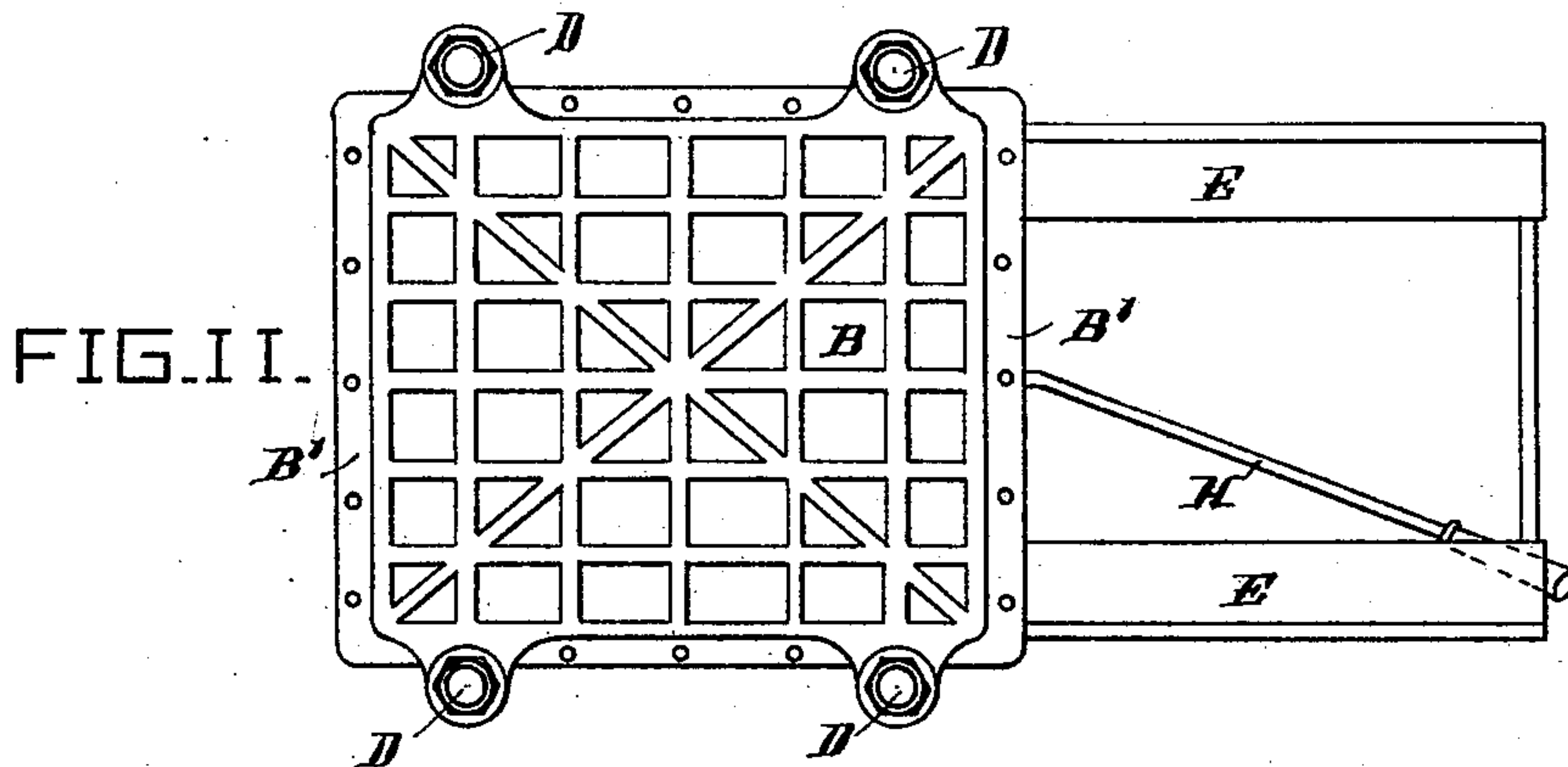
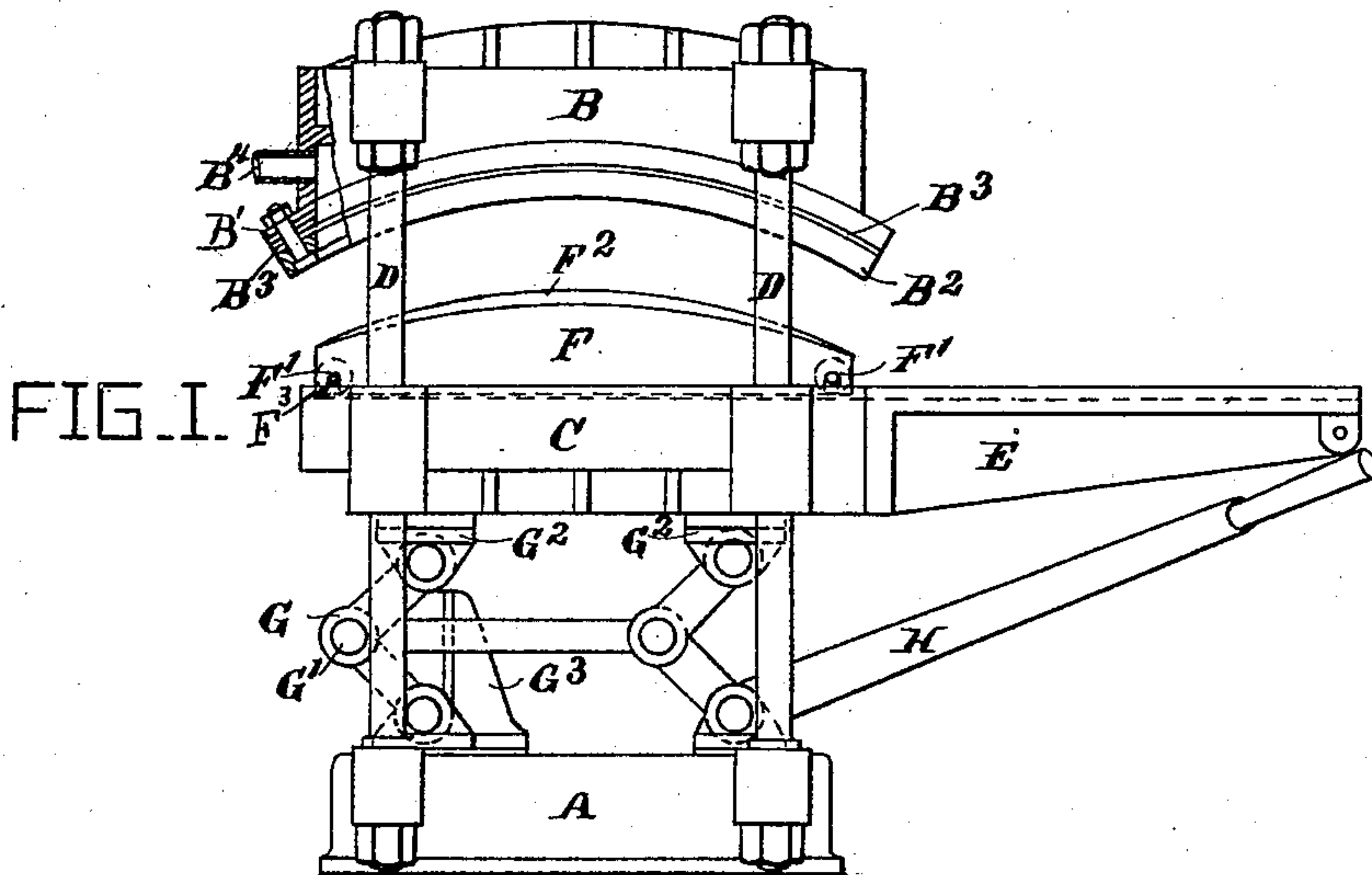


(No Model.)

A. GRAY.
PRESS FOR BENDING PRINTING PLATES.

No. 507,431.

Patented Oct. 24, 1893.



Witnesses:
Walter E. Allen
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Inventor.
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UNITED STATES PATENT OFFICE.

ALEXANDER GRAY, OF LONDON, ENGLAND.

PRESS FOR BENDING PRINTING-PLATES.

SPECIFICATION forming part of Letters Patent No. 507,431, dated October 24, 1893.

Application filed November 14, 1892. Serial No. 452,110. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER GRAY, a subject of the Queen of Great Britain and Ireland, residing at The Mansion, Frognal, London, N. W., in the county of Middlesex, England, have invented a Press for Bending Printing-Plates, of which the following is a specification.

The object of this invention is to provide an improved press for bending printing plates used in rotary printing machines accurately to any desired curve, so that they may conform to the curve of the cylinder of which they are used.

The invention consists in a press having features of novel construction as hereinafter described and claimed in which I use hydraulic or pneumatic pressure applied to the surface of the plate through a concave sheet of flexible material which is pressed down over the surface of the plate by the fluid used. By the methods at present adopted, the bending of the plates is often effected imperfectly and the plates are to some extent damaged while being bent. To remedy this, I bend the plates by placing them over a former having plain convex surface and pressing them on to the former by fluid or gaseous pressure acting against the back of a sheet of flexible material placed over the surface of the plate. In this way the whole surface of the plate is uniformly and simultaneously pressed down on to the plain convex surface of the former, without any risk of injury to the printing surface from the pressure, and at the same time the irregular curvature which now arises from want of uniform simultaneous pressure over the whole plate is avoided.

My improved press is shown in the drawings.

Figure I is a side elevation. Fig. II is a top plan view and Fig. III is a front elevation.

A is the base, and B the top plate; these are tied together by the bolts or pillars D.

C is a table which rises and falls, guided by the bolts or pillars D, supported by the toggles G, and it carries upon it a traveling former F, having a plain convex surface.

E is a pair of brackets attached to the table C, on which the former is run out for convenience in working.

H is a lever for working the toggles G,

and thereby raising or lowering the table C. Springs not shown in the drawings may be arranged on the bolts or pillars D or otherwise, to assist in supporting the table and making it more easy to raise it.

The top is a casting hollow underneath provided with a concave flange B' all around it to which a frame B² having a concave face is bolted with a concave sheet B³ of waterproof canvas between the frame and flange so as to close in the hollow space watertight.

The former F is mounted on rollers F' so as to run in and out of the press on the brackets E E. The rollers are mounted on shafts F³ provided with springs F⁴ which raise the former so that it can run on the rollers. When pressure is applied to the former, these springs yield and allow the former to rest on the table C. The former F is turned to a smaller radius than that of the cylinder to which the plates are to be fitted. The exact radius must be determined by trial in each case, since it varies not only with the size of the cylinder, but also with the nature of the backing metal or type metal used, with the thickness of the plate, and with the amount of curvature. At one side of the former is a raised guide F² by which to set the plate to be bent, square with the former.

B⁴ is a supply pipe, for the fluid leading into the hollow top.

To operate the machine, the table C is lowered, the former F run out on the brackets and there heated sufficiently to make water hiss. The plate to be bent, having been previously heated in the usual way is laid on the former, covered with a piece of felt and the former with the plate is now run back into the press, and the table C is raised by the lever H till the shaft G' rests against the stop G³. Water or air is now forced into the hollow top B and the canvas thereby pressed down on to the plate with a pressure of about one hundred pounds per square inch. The plate is allowed to remain under pressure for about half a minute; the water is then run off, the table lowered, the former run out, and the plate taken off and allowed to cool.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A press for bending printing plates com-

prising a vertically movable table, a former raised and lowered, by the table, having a plain convex surface, a hollow top-plate having a supply pipe, and a concave flange, a frame fitting against the flange and having a concave face, a concave sheet of flexible material secured between the frame and the concave flange; substantially as described.

2. A press for bending printing plates comprising a vertically movable table, brackets extending from the table, a former traveling on the brackets and on the table and raised and lowered by the latter, having a plain convex surface, a hollow top-plate having a supply pipe and a concave flange, a frame fitting against the flange, and having a concave face a concave sheet of flexible material secured between the frame and the concave flange; substantially as described.

3. A press for bending printing plates comprising a base, a hollow top-plate having a supply pipe and a flange, tie-bolts, a vertically movable table, brackets extending from the table, a former traveling on the brackets and on the table, a frame fitting against the flange, a sheet of flexible material secured be-

tween the frame and the flange and means for raising and lowering the table; substantially as described.

4. A press for bending printing plates comprising a base, a hollow top-plate, having a flange, tie-bolts, a vertically movable table, a former raised and lowered by the table, a frame fitting against the flange, a sheet of flexible material secured between the frame and the flange, and a lever and toggles, by which the table is carried; substantially as described.

5. A press for bending printing plates comprising a base, a hollow top-plate, having a flange, tie-bolts, a vertically movable table, a former raised and lowered by the table, a frame fitting against the flange, a sheet of flexible material secured between the frame and the flange, a lever and toggles, by which the table is carried and the stop for limiting the movement of the toggles; substantially as described.

ALEXR. GRAY.

Witnesses:

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JNO. C. NEW.