

(No Model.)

A. FITTS.

COMBINED HYDRAULIC AND KNUCKLE JOINT PRESS.

No. 371,049.

Patented Oct. 4, 1887.

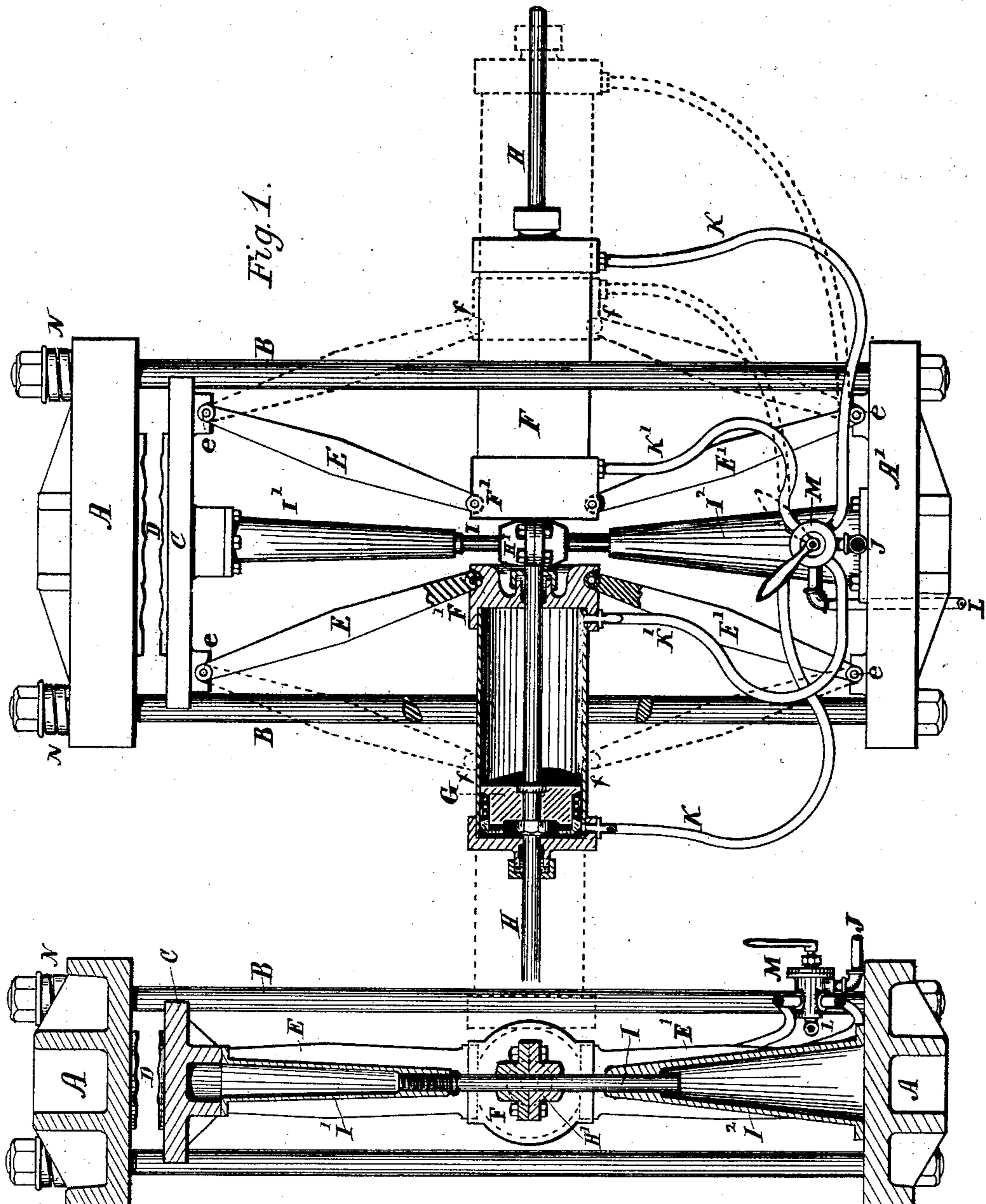


Fig. 2.

WITNESSES:

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ABRAHAM FITTS, OF WORCESTER, MASSACHUSETTS.

COMBINED HYDRAULIC AND KNUCKLE-JOINT PRESS.

SPECIFICATION forming part of Letters Patent No. 371,049, dated October 4, 1887.

Application filed March 29, 1886. Serial No. 197,060. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM FITTS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Combined Hydraulic and Knuckle-Joint Presses; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in combined hydraulic and knuckle-joint presses of that kind described in Letters Patent No. 295,159, of March 18, 1885, the object of my present invention being to provide a press for purposes wherein more rapid action with short distance of movement is desirable—as for the embossing or stamping of sheet-metal plates or other articles; and my invention consists in arranging the knuckle-joint arms and hydraulic-power cylinders to be double-acting, or so as to work to equal extent in both right and left directions past the centers or plane in which the arms stand when in direct line with each other and the knuckle-joints. These objects I attain by mechanism constructed and combined for operation as illustrated in the accompanying drawings, and hereinafter more fully described.

In the drawings, Figure 1 is a front view of the press constructed in accordance with my invention, one of the cylinders being shown in section, and dotted lines being employed to indicate the movement of the cylinders and arms; and Fig. 2 is a vertical central section transversely of the press.

In reference to parts, A denotes the head of the press; A', the foot; B, the upright standards or connecting-bolts; C, the follower; D, the embossing-dies; E E', the knuckle-joint arms; F, the hydraulic-pressure cylinders, the heads F' of which form the knuckle-joints for said arms. G indicates the piston; H, the piston-rods, and H' the central hub connecting the two piston-rods and working on the vertical guide-rod I, which rod is secured in the standard I', that depends from the follower C, and is arranged to slide within the standard I'', that extends up from the foot-piece A', or

vice versa. K K' indicate the flexible pipes for conducting the water to and from the interiorspaces of the cylinders F at opposite sides of the piston G. J indicates the supply, L the discharge, and M the cock for directing the flow of water through the several pipes for operating the cylinders inward or outward, as desired.

The connecting-joints e, whereby the extremities of the arms E E' are attached to the foot A' and follower C, are located near the outer ends of said follower C and foot A', so that when the knuckles F' are at their extreme inward position or brought together near the hub H', as shown in full lines on Fig. 1, the arms E E' will have an outward inclination from the knuckles to the joints E, and then when the knuckles F' are moved outward by the action of the cylinders the arms E E' will swing past a vertical position, or beyond a plane passing through the centers of the upper and lower pivots e, and when the knuckles have reached their outward position at f said arms will have an inward inclination, as indicated by dotted lines in Fig. 1.

The upper and lower joints e being in a plane intermediate between the limits of movement of the cylinders or knuckle-joints F, it will be seen that a single outward movement of the knuckles will cause the follower C to approach the head for closing the dies D, and also to recede from the head for again opening said dies, and that like action will occur on the inward movement of the cylinders and knuckles, thus giving double action of the pressing mechanism or dies D with a single movement of the cylinders.

The cylinders F are constructed for double action or for giving force at both sides of the pistons G, so as to exert power when moving the arms inward or outward, the general construction of the cylinders and pistons being somewhat similar to that described in the patent above named.

Relief-springs N may be arranged on the end of the standard above the head A to prevent damage to the mechanism by crushing strain when the arms pass the center. By arranging the parts in the manner described, a combined hydraulic and knuckle-joint press is produced which can be practically and successfully used for embossing purposes and similar work, the

speed at which the dies open and close being sufficiently rapid to accomplish the requisite quantity of work, while the hydraulic cylinders are not required to be speeded beyond a
5 practical degree in the use of hydraulic-pressure mechanism.

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

1. The herein-described combined hydraulic
10 and knuckle-joint press, having two oppositely-disposed pairs of knuckle-joint arms respectively arranged to operate outward and inward in both right and left directions past their centers or vertical planes passing through the
15 axes of the upper and lower end joints of the respective pairs of arms, substantially as and for the purpose set forth.

2. The combination, substantially as described, with the foot A' and follower C, of the
20 double-acting cylinders F, carrying knuckles

F', and the arms E, jointed to said head and follower at *e* in a plane intermediate between the limits of movement of the cylinders or knuckle-joints F'.

3. The combination, substantially as de- 25 scribed, of the follower C and head A, provided with standards I' and I², the double-acting hydraulic cylinders carrying the knuckle-joints F', the arms E E', the piston-rods H, having pistons G, the central connecting-hub, 30 H', and the guide-rod I, all constructed and arranged in relation to each other for operation as and for the purpose set forth.

Witness my hand this 24th day of February, A. D. 1885.

ABRAHAM FITTS.

Witnesses:

CHAS. H. BURLEIGH,
S. R. BARTON.