

(Model.)

T. A. BLAKE.
Machine for Breaking Pig Iron.

No. 240,951.

Patented May 3, 1881.

fig. 1

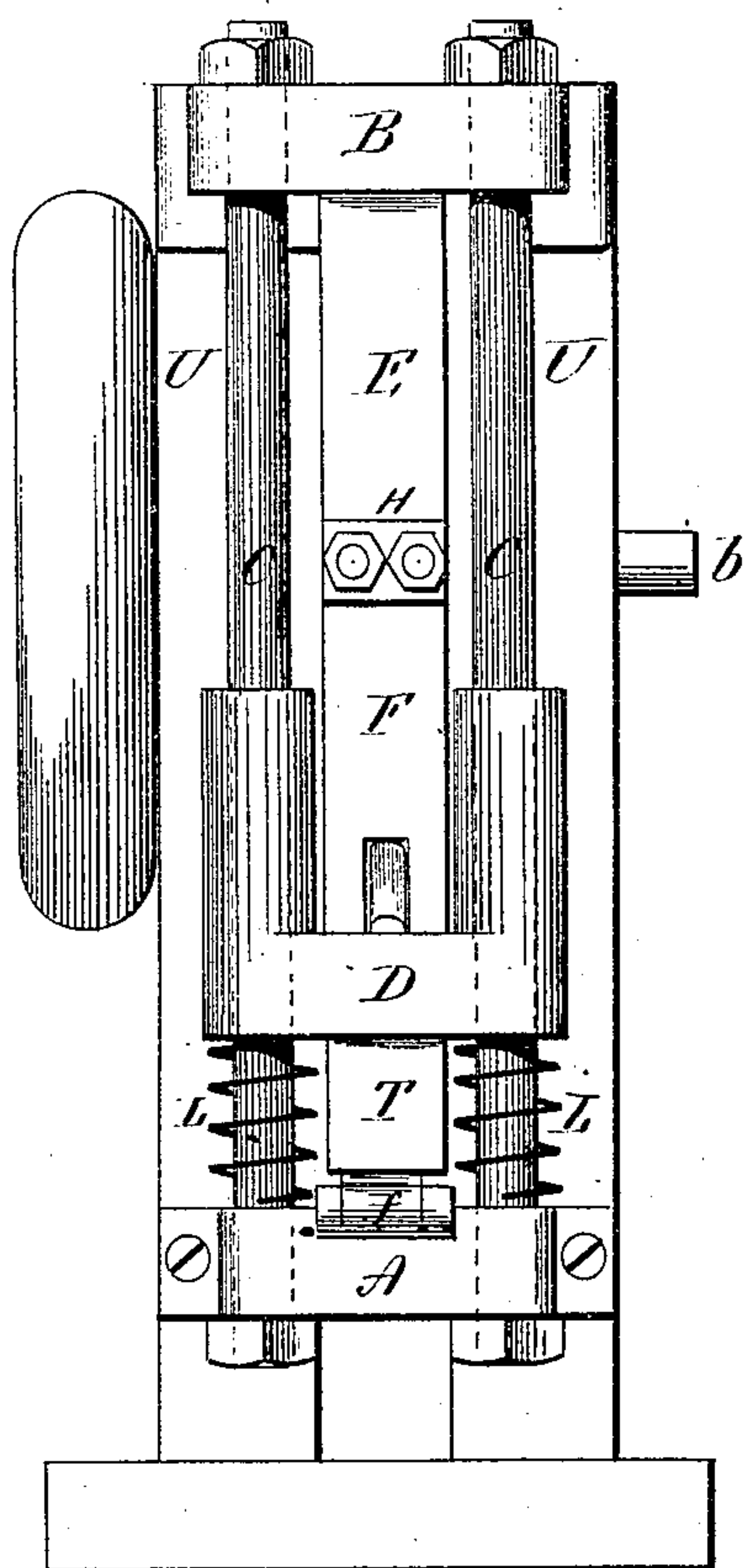


fig. 2

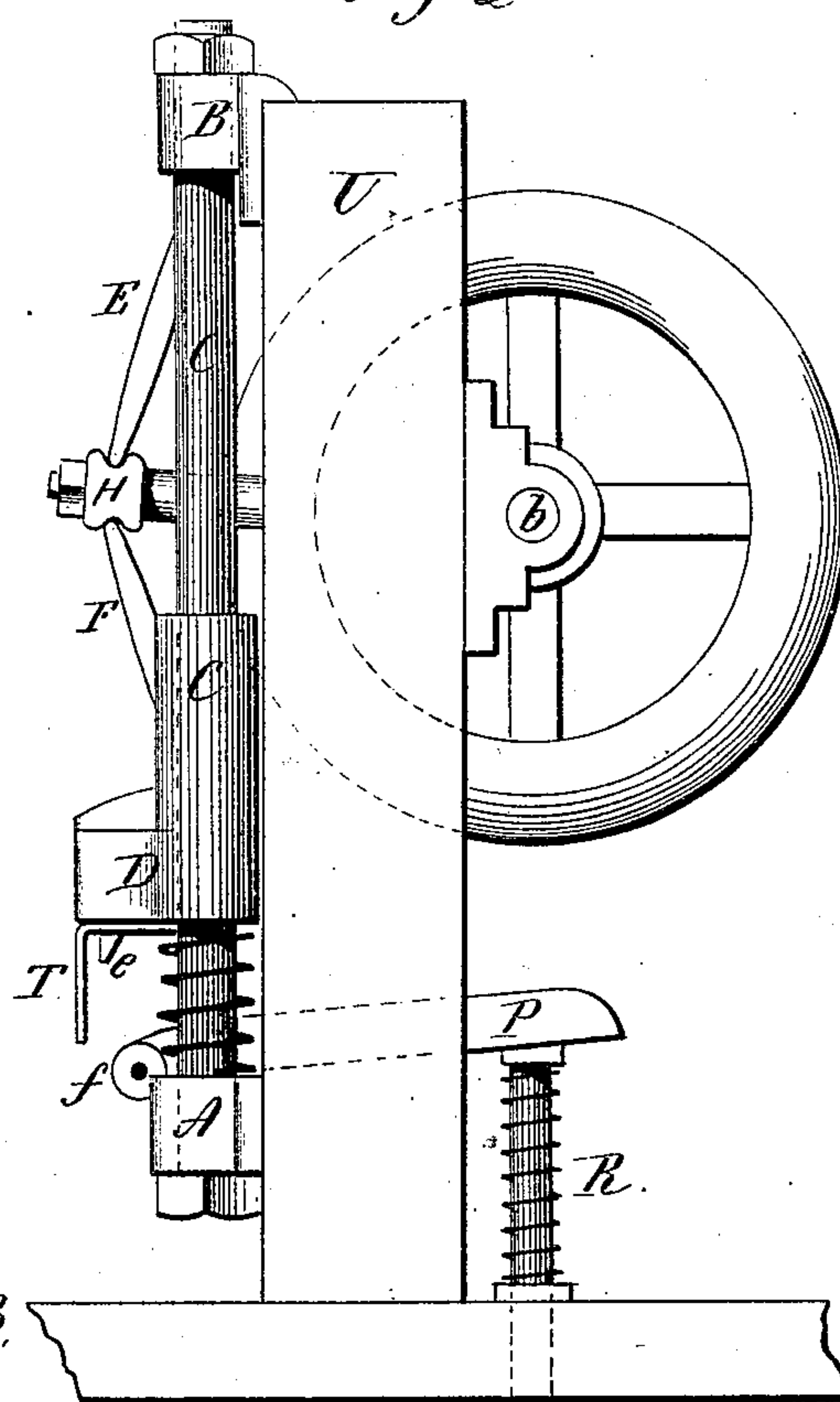


fig. 3

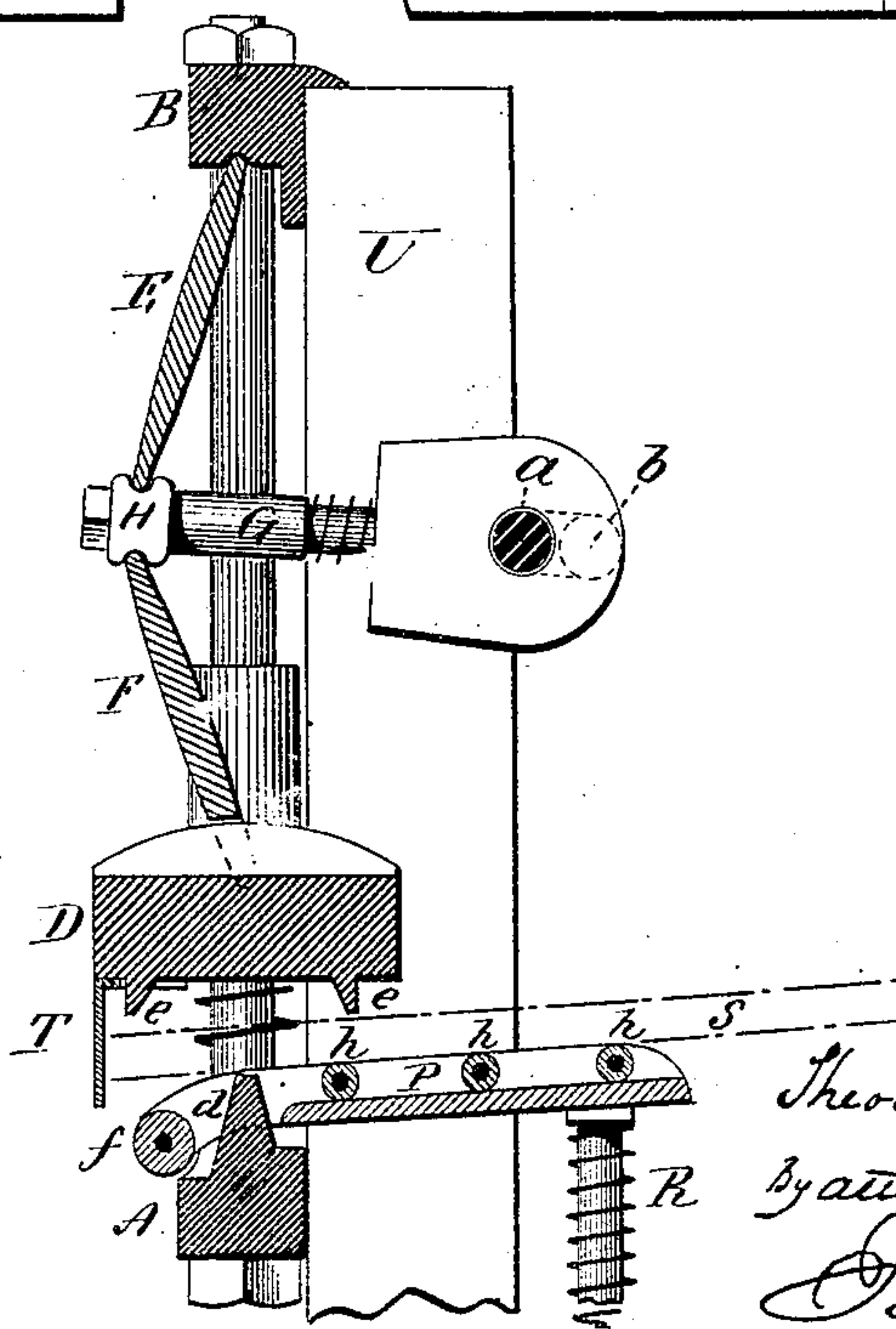
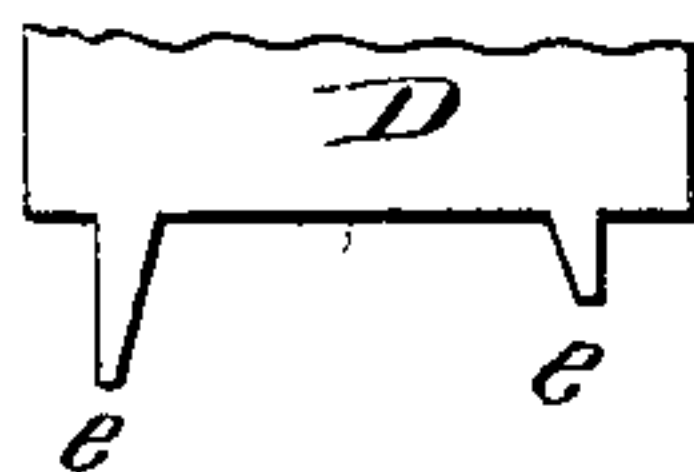


fig. 4



Witnesses,

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MACHINE FOR BREAKING PIG-IRON.

SPECIFICATION forming part of Letters Patent No. 240,951, dated May 3, 1881.

Application filed January 31, 1881. (Model.)

To all whom it may concern:

Be it known that I, THEODORE A. BLAKE, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Breaking Pig-Iron; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view; Fig. 2, a side view; Fig. 3, a vertical central section; Fig. 4, a modification.

This invention relates to an improvement in machines for breaking pig-iron.

In preparing pig-iron for introduction to the furnace it is necessary that it should be broken into short pieces. Generally this breaking is done by means of a hammer, making it a tedious and laborious operation. In some cases a breaking apparatus has been employed consisting of two bearing-points, upon which the pig was placed and a single bearing-point forced down upon the opposite side of the pig to bear between the two points below with sufficient force to break the pig; but this has not been a success, the labor of placing the pig on the bearings and removing the pieces being about equal to the labor of using the hammer.

The object of this invention is the construction of a machine by which the pig may be readily fed to the machine and the pieces deliver themselves therefrom; and the invention consists in the construction as hereinafter described, and particularly recited in the claims.

A is the bed or anvil, hung to the head B above by means of a pair of strong rods, C C, extending through the bed below and the head above; and between the head and bed is a slide, D, arranged to work upon the rods C C as guides, and so as to be worked up and down toward the bed A. A reciprocating movement is imparted to the slide D by means of a crank or eccentric, *a*, on the driving-shaft *b*, working a toggle, one part, E, of which takes its bearing in the head B above, the other, F, on the slide D below, the parts of the toggle connected to the eccentric or crank *a* by a pitman, G, carrying a bearing, H, for the toggles E F, as seen

in Fig. 3, and in the usual manner for similar toggles.

Below the slide D, and between that and the bed A, suitable springs, L, are arranged, the action of which is to force the slide D upward, and so that as the driving-shaft revolves, tending to draw the toggles into perpendicular line, the slide D will be forced downward, compressing the springs L, and then, as the toggles pass out of the perpendicular line, the springs react and force the slide upward; hence by the continuous rotation of the shaft a reciprocating motion is imparted to the slide D.

On the bed A is a single bearing-point or rib, *d*. On the slide D above are two similar ribs or bearing-points, *e e*, the one in front of and the other in rear of the rib *d* below, as seen in Fig. 3.

P is a feeding-bench, which, as here represented, is hinged to the bed A in front of the rib *d*, as at *f*, so that the bench in rear of the bed A may be depressed or raised, and is preferably supported upon a spring, R, the tendency of which is to force the rear end of the bench upward. This bench stands in an inclined position to the rib *d*, its rear end highest, and is provided with rollers *h*, more or less in number, upon which the pig S (represented in broken lines) is placed, the relative position of the rollers to the rib *d* being such that the pig laid upon the rollers will slide down over the rib *d*, as seen in Fig. 3, until it reaches a stop, T, in front; then, as the slide D descends, one of the ribs *e* strikes the pig in the rear and depresses the pig with the bench P until the other rib *e* in front strikes the pig; then, as the power is continued, the front or outer end of the pig will be broken off at the rib *d*, because of the depression of the pig in the rear and forcing down in front. As soon as the outer end is broken off the piece falls from the machine, the slide D rises, the bench also rises to bring the pig above the rib *d*, and then the pig moves or is moved forward until the end reaches the stop T; then another operation breaks the second piece, and so on. The entire strain of the breaking comes upon the tension-rods C C.

The bed A and the head B are attached to uprights U, upon which the bearings for the driving-shaft are also arranged, power being

applied to the driving-shaft in any convenient manner.

By this construction the machine may be made self-feeding after the pig has been placed upon the bench.

By arranging the two breaking ribs or points *e e* above and the one *d* intermediate below, the piece which is broken from the pig readily falls from the machine. This arrangement of breaking-points may be used without the feeding-bench, the workman presenting the pig into the position for breaking by hand; but the yielding feeding-bench is preferred, because of the ease with which the feeding may be done, and also because it may be made automatic by giving sufficient inclination to the bench.

The pitman *G* is made adjustable for the purpose of varying the throw of the slide *D*.

The stop *T* is made adjustable, so that the length of the piece to be broken may be varied.

The bench *P* may be made stationary, the surface on which the pig is placed being above the rib *d*, so that the pig will readily pass over the rib *d*. In this case the forward breaking-point *e* must be longer than the rear breaking-point, as seen in Fig. 4, and so that the pig will be first struck forward of the rib *d*, which will cause it to tip up at the rear until the rear rib or breaking-point *e* comes in contact with the pig; then the two, moving together, force the pig down from the rear until the break occurs; then that part at the rear falls upon the bench. This arrangement presents the same advantages, so far as the two breaking-points above and the one intermediate breaking-point below are concerned, because the broken piece will deliver itself from the machine.

I claim—

1. In a machine for breaking pig-iron, the combination of the bed with a single rib or breaking-point, over which the pig is placed, and the reciprocating slide above, provided with two ribs or breaking-points to bear upon the pig, one in front of and the other in rear of the rib or breaking-point below, substantially as described.

2. In a machine for breaking pig-iron, the

combination of the bed with a single rib or breaking-point, over which the pig is placed, and the reciprocating slide above, provided with two ribs or breaking-points to bear upon the pig, one in front of and the other in rear of the rib or breaking-point below, with a feeding-bench the surface of which is above or flush with the upper surface of the lower bearing-point, and upon which the pig is placed to be fed to the machine, substantially as described.

3. In a machine for breaking pig-iron, the combination of the bed with a single rib or breaking-point, over which the pig is placed, and the reciprocating slide above, provided with two ribs or breaking-points to bear upon the pig, one in front of and the other in rear of the rib or breaking point below, with a feeding-bench the surface of which is above or flush with the upper surface of the lower bearing-point, and upon which the pig is placed to be fed to the machine, and a stop to govern the length of the piece to be broken, substantially as described.

4. In a machine for breaking pig-iron, the combination of the bed with a single rib or breaking-point, over which the pig is placed, and the reciprocating slide above, provided with two ribs or breaking-points to bear upon the pig, one in front of and the other in rear of the rib or breaking-point below, and a feeding-bench constructed to yield against the breaking pressure, substantially as described.

5. In a machine for breaking pig-iron, the combination of the bed with a single rib or breaking-point, over which the pig is placed, and the reciprocating slide above, provided with two ribs or breaking-points to bear upon the pig, one in front of and the other in the rear of the rib or breaking-point below, and a feeding-bench constructed to yield against the breaking pressure, and a stop to govern the length of the piece to be broken, substantially as described.

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Witnesses:

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