

(No Model.)

H. O. REINHARDT.

STAMPING MILL.

No. 255,536.

Patented Mar. 28, 1882.

FIG. 1

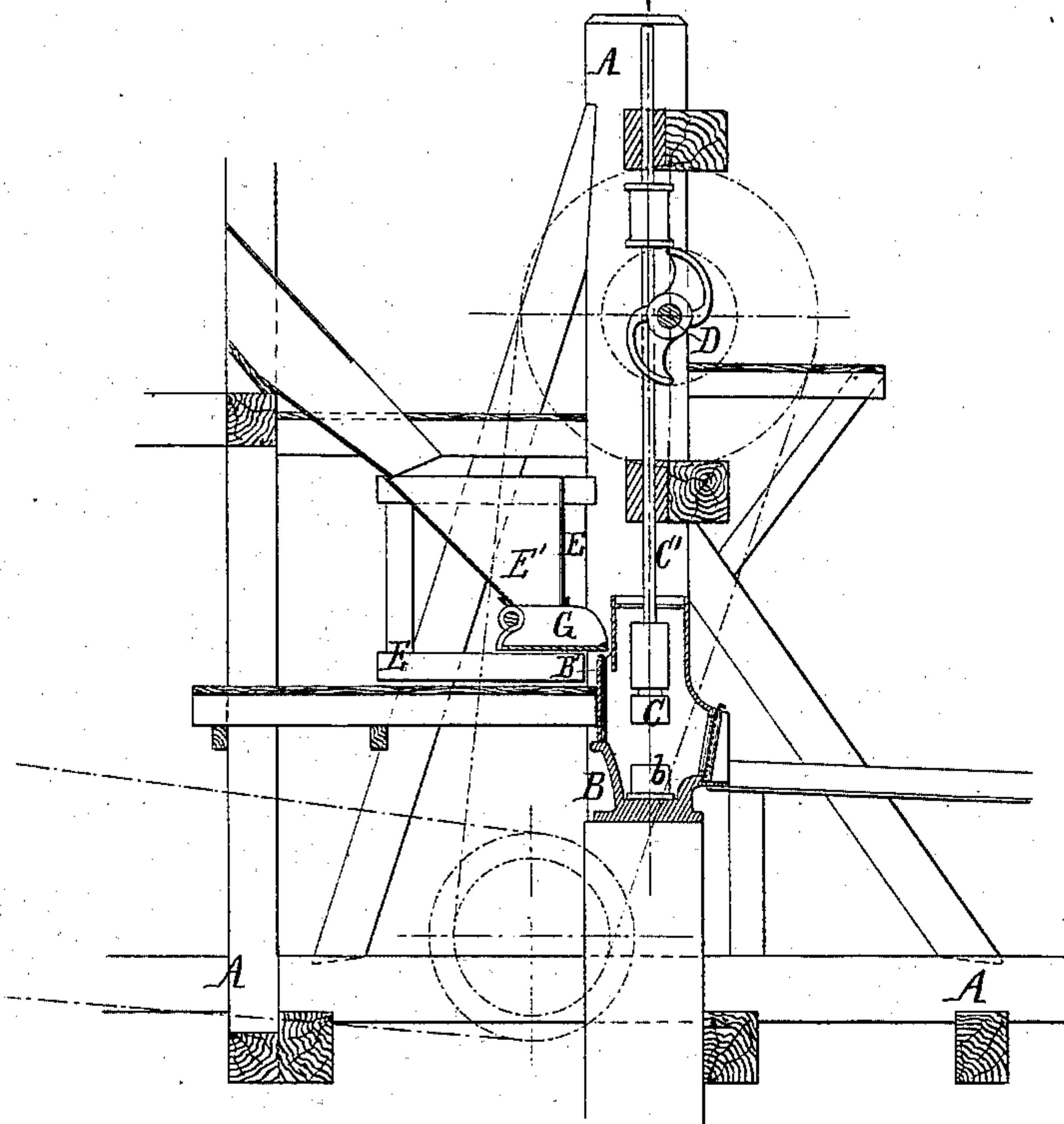


FIG. 2.

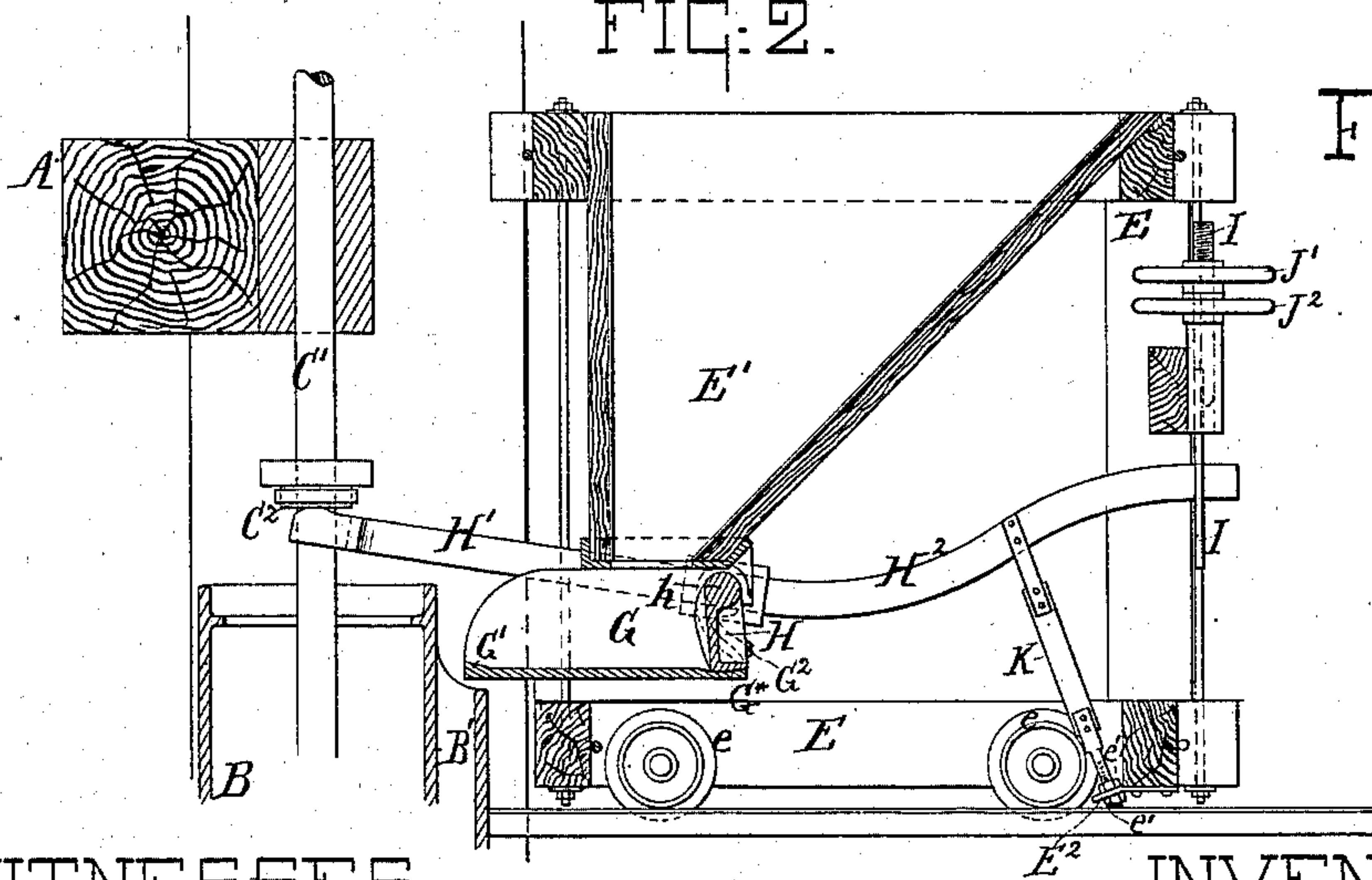
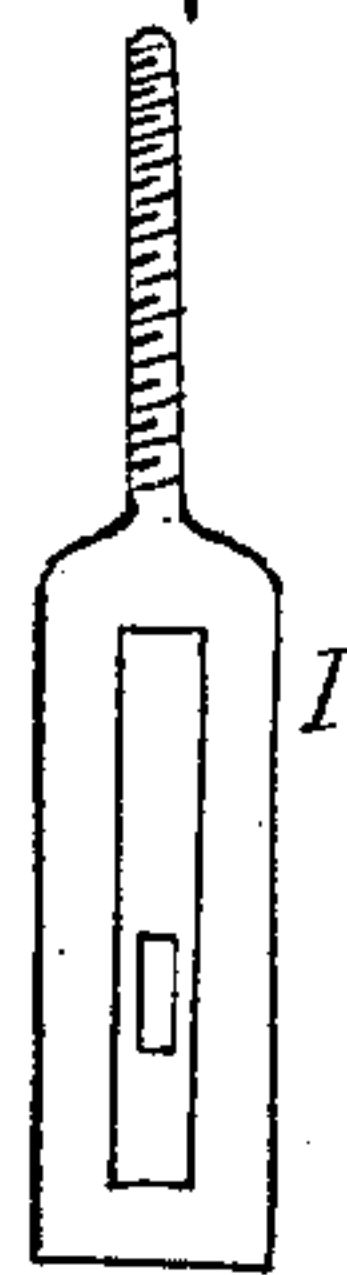


FIG. 2^a



WITNESSES:

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HERMANN O. REINHARDT, OF ARLINGTON, NEW JERSEY.

STAMPING-MILL.

SPECIFICATION forming part of Letters Patent No. 255,536, dated March 28, 1882.

Application filed August 4, 1881. (No model.)

To all whom it may concern:

Be it known that I, HERMANN O. REINHARDT, of Arlington, Hudson county, in the State of New Jersey, have invented certain new and useful Improvements in Stamping-Mills, of which the following is a specification.

The invention relates to the means for feeding or supplying the material to the battery. I supply it by introducing small increments, succeeding each other at very short intervals. The apparatus is unusually simple and effective. The force for operating the feeder is derived from one of the stampers. The material is acted on by a succession of impulses, which are due to the gentle force of a spring. The return motion of the feeder may be more violent, being received from the descent of the stamper. I provide means for adjusting the extent of the motion with great accuracy.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a diagram indicating the general position of the parts of a stamping-mill. Fig. 2 is a vertical section, showing the novel parts with so much of the other parts as is necessary to indicate their relation thereto. This is a section in the same plane as Fig. 1, but seen in the opposite direction. Fig. 2^a is a view of one of the parts detached and turned quarter around.

Similar letters of reference indicate like parts in all the figures.

A is the fixed framing, of timber or other suitable material, and B is the stout mortar, of cast-iron or other suitable material, containing a die, on which the stamp-head C, carried on a stamp-rod, C', is reciprocated in the ordinary manner through the agency of a revolving shaft, D, carrying cams or wipers, revolved by the power of a steam-engine or other suitable motor.

B' is a lip or shell exterior to the mortar proper, and which serves to receive and guide into the mortar the previously-broken ore or other material to be stamped, which is supplied from the shoe G, as will be described farther on.

E is a carriage, of timber or other suitable material, mounted on wheels e, which allow it to be moved backward and forward relatively to

the mortars. E' is a hopper therein, perpendicular on the front side, and having a back inclined at an angle of about forty-five degrees. The bottom is open, and allows the descent of the material to be treated through a sufficiently large opening. G is a shoe, of cast-iron or other suitable material, standing immediately below the opening and supporting the material which has passed through. A portion of the interior of the bottom of the shoe G is formed with a curve, G*, corresponding to the sweep of the lower edge of a stout flap, H, which I term the "feeder," which is fixed on a rocking shaft or axis, h, and is rocked through the agency of a bar, constituting in effect two levers, H' H², keyed on a projecting end of the shaft h and extending in opposite directions, the end H' terminating in a fork, which loosely embraces the rod C' of one of the stampers, and the other, H², being allowed to move up and down in a vertical slot in an adjustable bar, I, which is screw-threaded at its upper end, and is adjusted up and down by a nut and jam-nut, each equipped with a hand-wheel for convenient operation, as indicated by J' J².

K is a stout spring, of rubber or other suitable material, secured by one end to the lever H² and by the other to the bracket E², fixed on the carriage E. The junction is effected by nuts e', set on a threaded bar, which forms a fastening of the spring K. This allows the force of the spring to be adjusted with great delicacy. The force of the spring tends to hold the arm or lever H² always firmly down in the bottom of the slot in the bar I; but the length of the slot is sufficient to allow it to ascend by the stretching of the spring whenever the opposite arm, H', is depressed by the elastic buffer C², fixed in an adjustable position on the stamp-rod C'. The adjustment may be effected by aid of a pinching-screw. (Not shown.) The reciprocations of the stamp-rod C' act through such adjustable collar on the forked end of the arm H' at the termination of each descent with a blow, which is more or less effective, according to the quantity of material in the mortar. When there is too much material the descent of the stamp will be arrested so completely thereby that the effect on the lever H', and consequently on the feeder H, is so small that little or no motion is imparted thereto, and thus conditioned no material will be fed in; but

when the material has been stamped fine and has escaped through the screens until the mortar is nearly empty the stamp will descend at at each blow nearly or quite to the die *b*. This increased descent induces a more powerful action on the arm of lever *H'*, and consequently a greater extent of the movement backward of the feeder *H*. Each descent of the stamper induces a quick backward movement of the feeder, and some of the material to be stamped falls promptly into the narrow opening thus provided between the feeder and the material previously in the shoe *G*. The ascent of the stamper and the contraction of the spring *K*, which spring has been meanwhile extended, induce the forward movement of the feeder. This forward movement of the feeder, acting on the mass of material before it, urges the whole gently forward, and the particles at the extreme front fall off into the mortar. It follows that the feed is automatically regulated in amount by the quantity of material already in the mortar, and also that the amount fed under any given condition may be controlled by the attendant by simply adjusting the slotted bar *I* upward to make it feed less and downward to make it feed more, and that the action under all conditions will be nearly constant—that is to say, the material will be supplied in small amounts at each descent of the stamper. It will also be seen that the action which urges forward the material in the shoe *G* is always that due to the force of the spring *K*, the movement due to the blow of the stamper being always in the reverse direction and having no effect on the material being fed, except to allow the descent of a portion from the hopper into the shoe ready to be fed forward with the rest by the greater return motion due to the spring. This mode of working offers great advantages over similar arrangements heretofore used, but in which the feeding has been effected by the downward motion of the stamper, while the spring only brought the parts back to the first position. With arrangements of this nature it is evident that the feeding must be effected during the very short period in which the stamper continues its downward motion after striking the feeding apparatus. I have found that the mass of ore in the shoe offers a certain elasticity, whereby the feed, according to the old method, is rendered unequal.

In my apparatus, where the contraction of the spring effects the feeding, much more time is available for the purpose, and consequently the flap *H* acts upon the material more slowly and with a gentler force, so that the elasticity of the material will be overcome, and at the same time a quantity of material will be fed determined exactly by the amount to which the lever *H'* has been depressed.

The beveled rise *G'* at the front or delivery end of the shoe *G* may be increased or diminished; but I prefer about the proportions shown. It is important that the conditions be such that the mass of material in the shoe can

be moved gradually forward at each reciprocation of the feeder, and at the same time that there be a restraint imposed to prevent the material from falling off in large quantities. I believe that the beveled form of the rise *G'* is of advantage in lifting the forward portion, and thereby destroying the tendency to adhesion or agglomeration of the broken material in the shoe which is liable to occur with some kinds of ore in certain conditions of dampness.

The bearing-surface of the arm *H'*, which applies under the elastic collar *C²*, should be rounded a little, as shown. This rounding enables it to well receive the blows of the collar *C²*, and also facilitates the movement of the entire carriage *E* and its attachments forward and backward without necessitating any attention to the apparatus. The rounded bearing of the arm *H'* moves easily inward and outward under the collar when necessary, whether the stamper be down or up.

Modifications may be made in many of the details.

The carrying-wheels *e* may be dispensed with and the carriage *E* moved on slides or allowed to remain stationary.

There may be five or any other suitable number of stampers connected in a battery and worked by the same wiper-shaft, and with a single carriage, *E*, hopper *E'*, shoe *G*, and feeder *H*. I prefer that the parts be so adjusted that the material will be fed directly into the central portion of the mortar, so as to be supplied under the three middle stampers, and that the material be worked therefrom to the end of the stampers by the concussions. In such case the stamper which operates the lever *H'* may be the middle one of the series, or, preferably, the second from one end.

Instead of the axis *h* being a "rocking-shaft"—such as is ordinarily so called in more refined mechanism—the feeder *M* and its bearing-trunnions or axis *h* may be a single casting mounted in recesses in the shoe *G*, as indicated. It is introduced from below and held up by two supporting-pieces, *G²*, each secured by a bolt, as shown. The effect is to oscillate the feeder on an axis near the upper edge with the result explained.

I claim as my invention—

1. In a stamping-mill, the shoe *G*, hopper *E'*, feeder *H*, spring *K*, and the stamper-rod *C'*, provided with the collar *C²*, combined and arranged as and for the purposes herein specified.

2. In a stamping-mill, a reciprocating feeder, in combination with the shoe *G*, having a beveled rise, *G'*, at the front, as herein specified.

3. In a stamping-mill, a reciprocating feeder, *H*, mechanism *C²* to actuate it in one direction, and a spring or analogous gentle force to actuate it in the other direction, in combination with the movable rod *I*, provided with suitable adjusting means, *J' J²*, arranged to allow the adjustment of the feed, as herein specified.

4. The combination, with a suitable mortar,

of one or more stampers and operating means therefor, a reciprocating feeder, means for actuating the feeder backward by the mechanism and forward by a spring or analogous gentle force, means for limiting the travel of the feeder forward, and means for automatically limiting the travel of the feeder backward by the quantity of material in the mortar, all substantially as and for the purposes herein specified.

In testimony whereof I have hereunto set to my hand, at New York city, this 2d day of August, 1881, in the presence of two subscribing witnesses.

H. O. REINHARDT.

Witnesses:

F. H. McDOWELL,
FRANK E. PEITS.