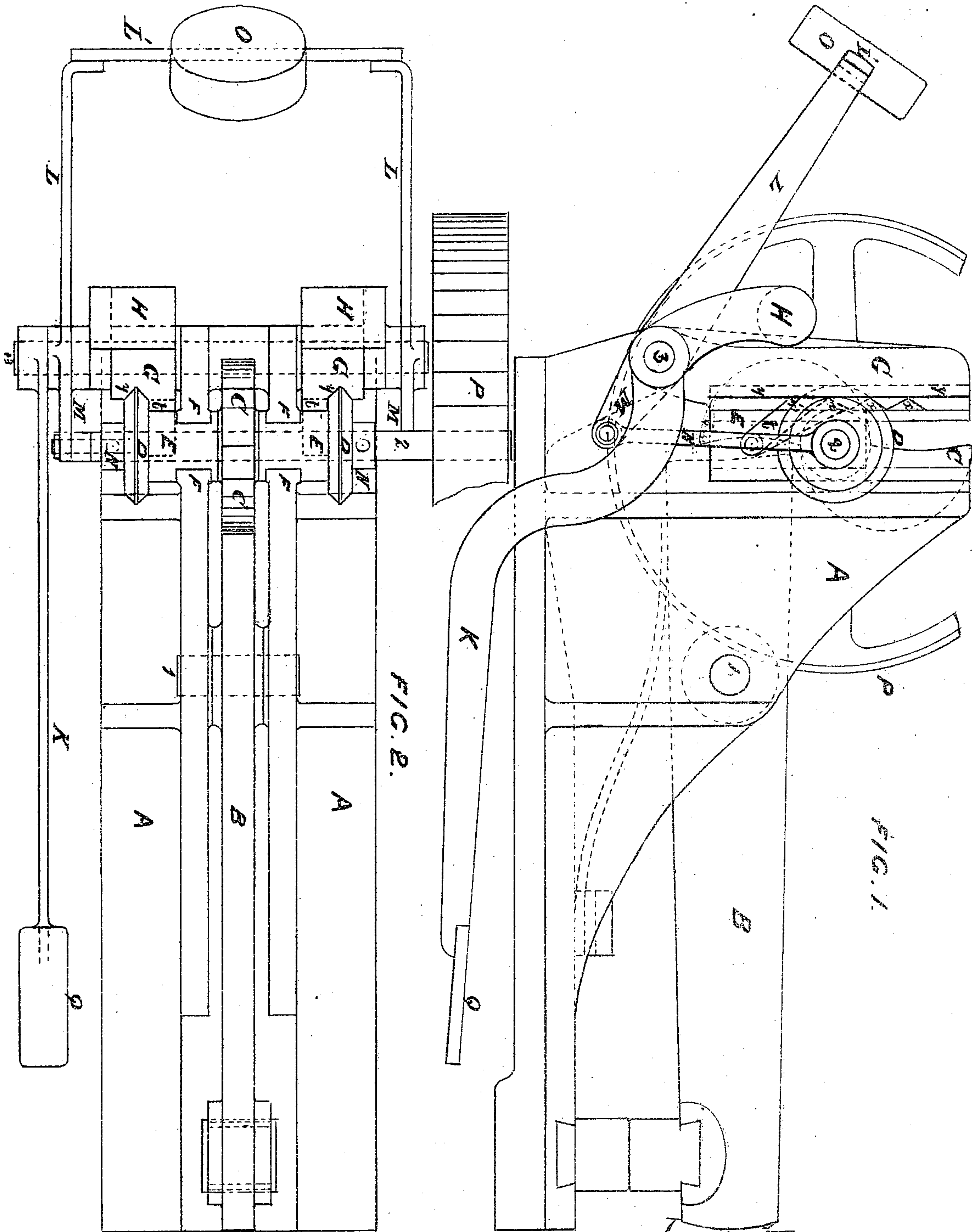


HUGH BAINES' IMPROVEMENTS IN POWER HAMMERS.

118181

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Inventor
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UNITED STATES PATENT OFFICE.

HUGH BAINES, OF TORONTO, CANADA.

IMPROVEMENT IN TILT-HAMMERS.

Specification forming part of Letters Patent No. 118,181, dated August 22, 1871.

To all whom it may concern:

Be it known that I, HUGH BAINES, of the city of Toronto, county of York, Province of Ontario, in the Dominion of Canada, engineer, have invented certain Improvements in Power-Hammers, of which the following is a specification:

My invention relates: First, to the application of hinged movable upright bars provided with suitable teeth on their faces, which are pressed against and are for the purpose of gearing into and locking the vertical guide-blocks carrying the driving-pulleys, the hammer-cam and hammer-cam shaft of power-hammers, by means of tongues fixed in the guide-blocks working into the said teeth; and, further, having grooves cut on their faces which are brought in contact with corresponding friction-pulleys keyed on the hammer-cam shaft, whereby an adjustable vertical motion is transmitted to the guide-blocks, and the stroke of the hammer is lengthened or shortened at pleasure. Secondly, to the application of a foot-lever and cam for the purpose of pressing upon and forcing or releasing the hinged upright bars, with their grooves and teeth, in or out of gear with the friction-pulleys and tongues fixed in the guide-blocks before mentioned. Thirdly, to the application of a counterbalance-weight and levers for the purpose of lifting the guide-blocks and their appurtenances out of gear with the hammer when the machine is not required.

Figure 1 is a side elevation of a power-hammer with my invention attached. Fig. 2 is a plan thereof.

A is the hammer-frame; B, the hammer oscillating on the shaft 1. C C is the hammer-cam or lifter. P is the driving-pulley, and D D are friction-pulleys; all of which are keyed to the shaft 2, which revolves in guide-blocks or bearings E E, moving vertically in upright guides F F F F. G G are upright bars hinged loosely on shaft 3, and having teeth, marked *x x x x*, and grooves, marked *y y*, formed on their inner faces. *t t* are tongues or catches fixed in the guide-blocks E E, which drop into the teeth *x x x x* on the upright bars G G, and thereby lock or confine the guide-blocks E E at any required height, as hereinafter described. H H are cam-levers keyed on the shaft 3, and suitably formed so as to press upon the back edges of the hinged bars G G, as shown. K is a foot-lever keyed onto shaft 3 and operating upon the cam-levers H H, whereby they either

press upon or are released from the back edges of the hinged bars G G, as before described. L L and M M are counterbalance-levers working loose on the shaft 3. The longer levers L L are connected at the ends by a cross-bar, L', and weight O. The shorter levers M M are coupled, by links N N, to the shaft 2, revolving in the guide-bearings E E before described.

The hammer, as shown in Fig. 1 on the drawing, is down, or in a state of rest. In this position the hammer-cam C C, (which is off the hammer,) with its shaft 2, its driving-pulley P, and its guide-blocks E E, is in its lowest position in the vertical guides F F F F. The upright bars G G are also, it is to be presumed, pressed hard against the guide-blocks E E by the cams and foot-lever H H and K, the guide-blocks E E being held in their position by the tongues *t t*, which are in gear with the lowest teeth *x x* on the faces of the upright bars G G. The foot-lever K is in its lowest position, and the counterbalance-levers and weight, with their links of connection N N to the guide-blocks, will be also in the position shown on the drawing. Power being now applied to the driving-pulley P, the hammer-cam C C revolves, and being in its lowest position, as before described, gives to the hammer B its full lifting throw. If a shorter stroke is required for the hammer B, the pressure being removed from the foot-lever K and the cams H H, the upright bars G G fall back, and the tongues *t t* in the guide-blocks being free to pass the faces of the teeth cut upon their inner faces, the guide-blocks E E, by the action of the counterbalance-weight O and levers before described, rise in their vertical guides F F F F until, by pressing upon the foot-lever K, the upright bars G G are again brought forward sufficiently far as to allow the tongues *t t* to fall into gear with any of the teeth *x x*, thereby retaining the guide-blocks at any required height, and so shortening the throw of the hammer B at pleasure. Again, if it is required, when in this position, to lengthen the throw of the hammer B, the upright bars being further pressed hard against the guide-blocks E E, the friction-pulleys D D are brought in contact with the grooves on the inner faces of the upright bars, and, in revolving against them, will propel the guide-blocks to the lower ends of the guides F F F F, thereby lengthening the throw of the hammer B at pleasure.

A rack may be fitted near the foot-lever at Q for the purpose of keeping the foot-lever steady in any position.

It is evident that the upright bars G G could be forced against the friction-wheels by other mechanism than that described, as, for instance, by a wedge or screw. I prefer, however, the levers K H. And it is also evident that the bearings E E might be caught and held by other mechanism than that herein described—for instance, by a spring or pin. I prefer, however, that described. Therefore I do not wish to limit my invention to these particular levers K H, or to these particular catches *t t x x*, &c.

I claim as my improvements in power-hammers—

1. The combination of the hammer-helve B, shaft 2, cam C, the vertically-adjustable bear-

ings E E, guides F F, links N N, and weighted levers L M, with any suitable mechanism for catching and holding the bearings at different vertical points, substantially as and for the purpose specified.

2. The combination of the hammer-helve B, shaft 2, cam C, vertically-adjustable bearings E E, guides F F, hinged upright bars G G, friction-wheels D D, links N N, weighted levers L M, and any suitable mechanism for forcing the bars G G against the friction-wheels, substantially as and for the purpose specified.

City of Toronto, 24th day of July, 1871.

HUGH BAINES.

Witnesses:

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