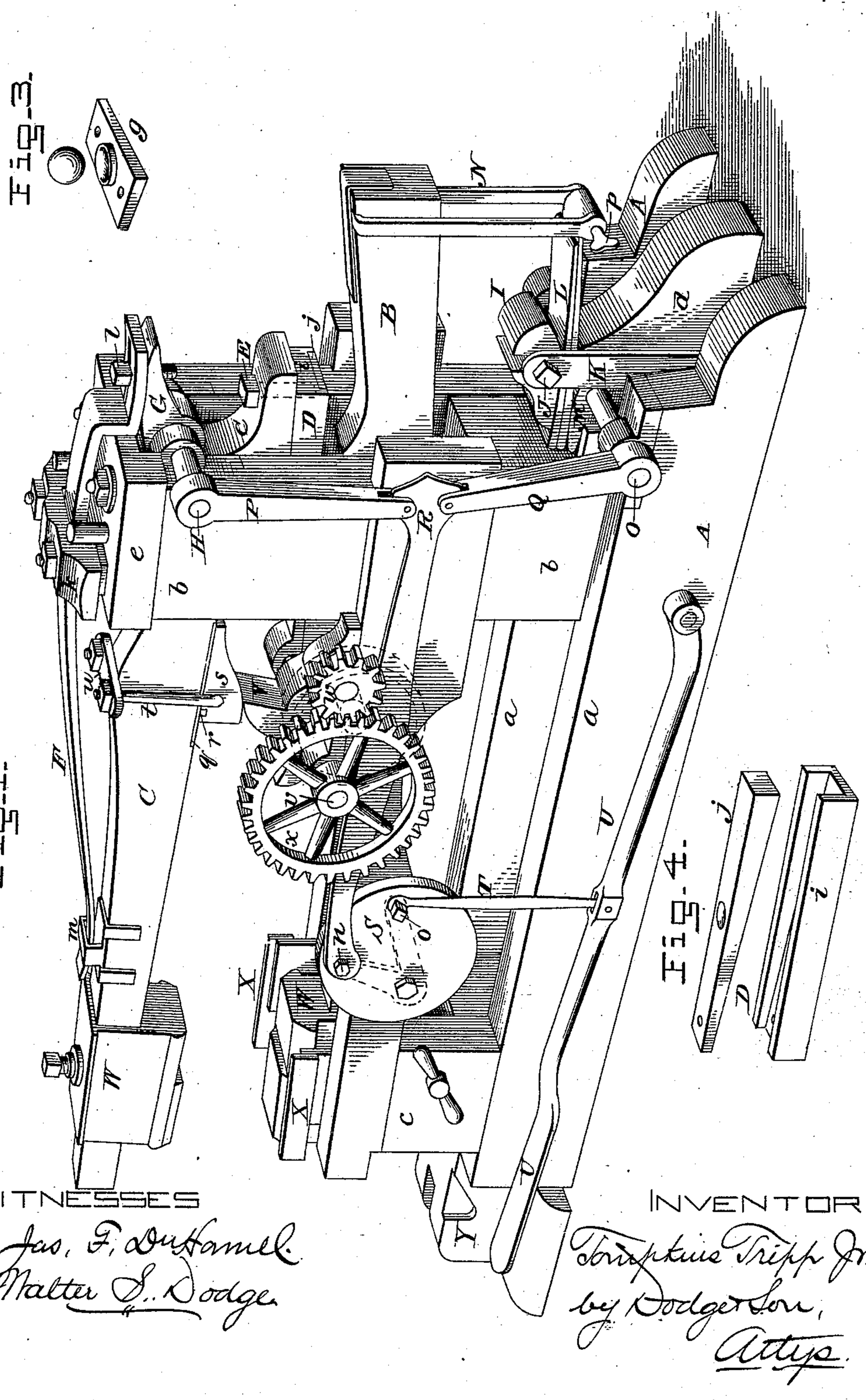
(No Model.)

2 Sheets—Sheet 1.

T. TRIPP, Jr.

TRIP HAMMER.

No. 301,937. Patented July 15, 1884.



WITNESSES

Jas. F. DuHamel.

Walter S. Dodge.

INVENTOR:

Tristram Tripp Jr.,

by Dodgerson,

Attys.

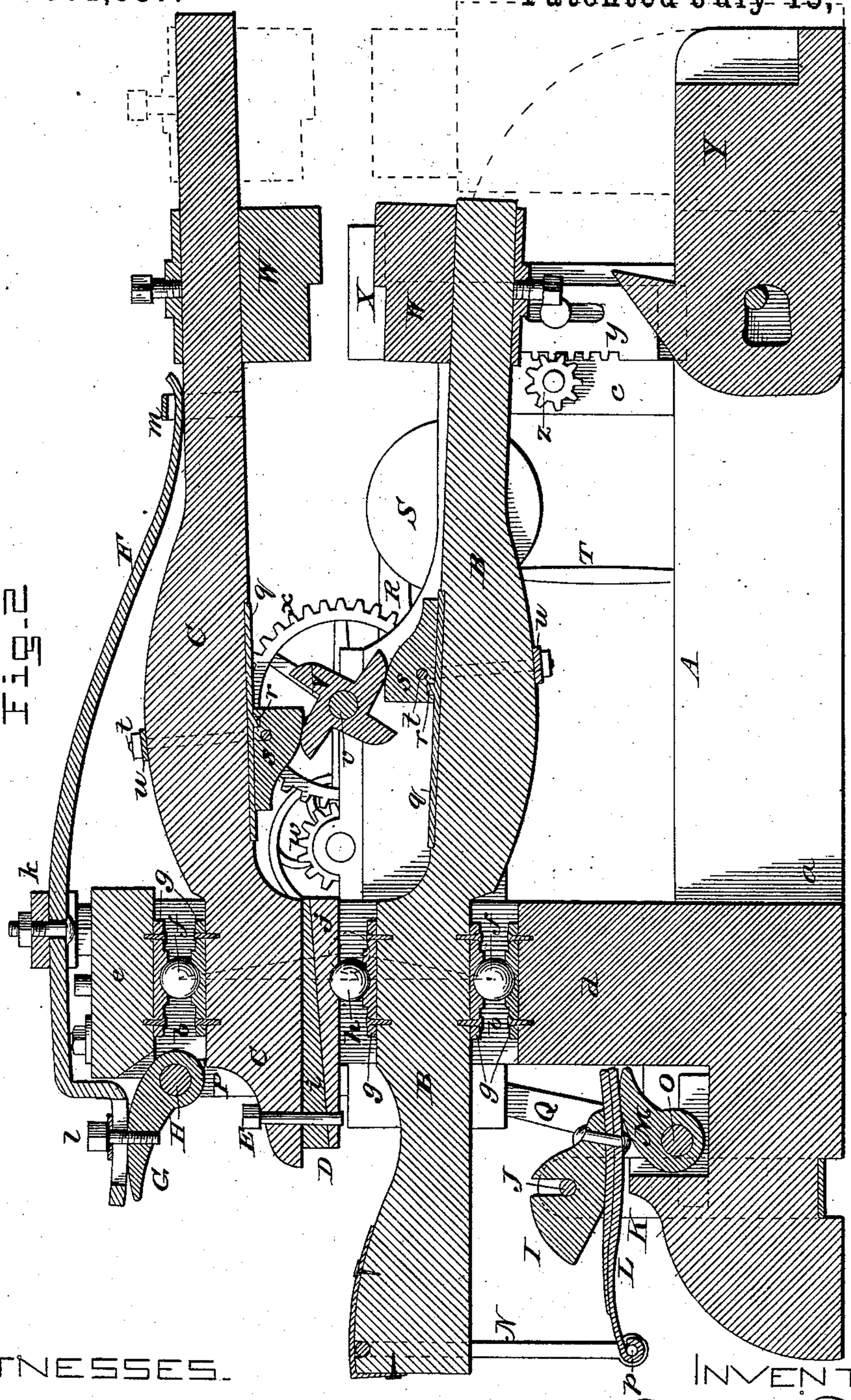
(No Model.) 2 Sheets—Sheet 2.

T. TRIPP, Jr.

TRIP HAMMER.

No. 301,937. Patented July 15, 1884.

Fig. 2



WITNESSES.

Jas. F. DeHamel
Walter S. Dodge.

INVENTOR

Tomkins Tripp Jr.
by Dodger Son,
Attys.

UNITED STATES PATENT OFFICE.

TOMPKINS TRIPP, JR., OF BELOIT, WISCONSIN.

TRIP-HAMMER.

SPECIFICATION forming part of Letters Patent No. 301,937, dated July 15, 1884.

Application filed August 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, TOMPKINS TRIPP, Jr., of Beloit, in the county of Rock and State of Wisconsin, have invented certain Improvements in Trip-Hammers, of which the following is a specification.

My invention relates to trip or tilt hammers; and the improvements consist, primarily, in a novel construction and arrangement of parts whereby two hammers are caused to operate simultaneously upon opposite sides of the objects acted upon.

The invention further consists in means for connecting and disconnecting the two hammers, so that they may be operated together or singly; in a block or support arranged to be brought under or removed from beneath the lower hammer to support it when only the upper hammer is in action, or to permit it to fall when both are in action; in an adjustable support for the object operated upon, and in various other features and details hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a perspective view of my improved machine; Fig. 2, a vertical longitudinal section of the same; and Figs. 3 and 4, views illustating the supporting or bearing plates.

As hitherto constructed, trip or tilt hammers have more generally been provided with a fixed anvil and a single movable hammer, the anvil serving as a support for the object to be operated upon, and the hammer serving to pound or beat said object upon one face at a time. Such pounding or beating from or upon one face only causes the metal to become more dense or solid at one side than at the other, and thus causes it to wear unequally in use, or to possess less strength in one part than another, whereas if the pounding be effected simultaneously from opposite sides the texture of the metal will be uniform throughout. Moreover, a given amount of work can be accomplished in a shorter time with like power, or in the same time with less power, under this plan than in the ordinary way.

Referring now to the drawings, the construction of the machine will be explained, it being remarked, however, that the construction may obviously be modified as to its details without departing from the spirit of my invention.

A represents a strong frame, which will ordinarily be made of wood, and which consists, essentially, of sills *a a*, uprights *b b* at the rear end, in which the hammer beams or helves are mounted, and shorter uprights *c c* at the forward end, which carry and sustain the adjustable work-supports hereinafter described.

Between the uprights *b b* is secured a bed-block, *d*, and upon their upper ends is secured a cap-plate, *e*, which block and plate respectively form the supports or bearings of the hammer beams or helves B and C, which also have an intermediate movable bearing in common. The pivotal support of the lower beam or helve, B, consists of a ball or sphere, *f*, having its upper and lower sides or faces seated in plates *g g*, one secured to bed-block *d* and the other to the lower side of the helve or beam, and the pivotal support of the upper helve or beam, C, is of like construction, but at the upper side of the beam, the upper plate, *g*, being bolted or secured to the under side of the cap plate or block *e*, as shown in Fig. 2. Between the two beams, and serving to connect them and cause them to mutually support each other, is a third sphere or ball, *h*, resting at its lower side in a concave plate, *g*, secured to the upper side of the lower helve or beam, and at its upper side seated in a plate or block, D, which is divided diagonally into two parts, *i j*, resting one upon the other, as shown in Fig. 2, the upper part being formed with depending side flanges to guide the lower part and prevent lateral movement thereof. The two parts are normally connected by a vertical pin, E, passing through both, as shown, so that ordinarily the two parts move together and constitute, in effect, a single piece. It will be seen that with the parts thus construced and arranged, the spheres *f f* form pivots for the beams or helves B C, and that if one of said beams is caused to rock or tip upon its pivot the other will be caused to move in unison with it, the intermediate sphere, *h*, traveling forward and backward as the hammers separate and come together, as indicated by dotted lines in Fig. 2. If, however, the pin E be withdrawn and motion be given to the upper beam or helve, it will not be imparted to the lower helve or beam through the intermediate connections, but the part *i* of plate or block D will slide upon the part *j*

thereof, the latter rocking or tipping upon the ball or sphere *h* as a pivot, to accommodate itself to the varying inclination of part *i*.

F indicates a heavy spring, bearing at its forward end upon helve or beam C, passing beneath a strap or yoke, *k*, above the cap-plate *e*, slotted at its rear end, and resting at said end upon a cam, G, with which it is loosely connected by a bolt, *l*, to prevent lateral play or displacement. At its forward end a metal loop or yoke, *m*, upon the beam C prevents lateral movement of the spring and retains it in proper relative position.

I represents a rocking block deeply grooved in its upper side and pressed upward against the under side of a horizontal bolt or rod, J, carried in suitable arms or standards K, secured to the main frame, said block having a spring, L, secured to its under side, and being held up against the bolt or rod by a cam, M, bearing against the lower face of spring L, as shown in Fig. 2. The outer or moving end of spring L is connected by a yoke or stirrup, N, with the rearward extension of beam or helve B, and the cam M is made fast upon a shaft, O, which may be rocked or turned in its bearings in frame A to throw up its end, thereby elevating the inner and depressing the outer end of the spring, and through the yoke or stirrup N drawing down upon the rear end of helve or beam B. The shaft H of cam G carries a rigid arm, P, and the shaft O of cam M is furnished with a like arm, Q, the ends of which arms are connected with the end of a pitman, R, common to both, and connected at its opposite end to the crank-pin *n* of elbow-lever or crank-wheel S, the other pin, *o*, of which is connected by a rod, T, with a foot-lever or treadle, U, as plainly shown in Fig. 1. By depressing treadle U the two cams are simultaneously rocked and caused to place the springs F and L simultaneously under tension or compression, as will be readily understood from the drawings. When, however, only the upper hammer is desired to move, the connecting-pin *p* is withdrawn, and the yoke N is thereby disconnected from spring L, so that cam M meets with no resistance therefrom, although rocked in unison with cam G.

V represents the cam-wheel ordinarily employed for operating the upper helve or beam only, but serving in the present instance to both raise the upper and depress the lower beam, and then permit them to be suddenly thrown forward, the upper one through the action of the spring aided by gravity, and the lower one through the action of the spring alone, or, if found desirable, with the aid of a counter-weight applied in rear of the pivot of the helve or beam. Each beam, when made of wood, as will generally be preferred, is furnished with a metal plate, *q*, having a rib or projection, *r*, to prevent displacement or play of metallic bearing-blocks *s*, against which the arms of the cam-wheels act. When the beams or helves are made of metal, the projection may be integral therewith. Each block is held in place by a yoke or strap, *t*, passing through the block and about the beam, the ends of which yoke or strap are passed through a plate, *u*, and provided with retaining-nuts, as shown. The strap of the lower block is or may be left sufficiently loose to permit the block to be raised up clear of the rib *r* and slide forward out of reach of the arms of the cam-wheel V, in which case the lower beam is to remain inoperative, the pin *p* being at the same time withdrawn, as above mentioned; or the nuts may be turned back to release the strap or yoke *t* in case the latter is clamped firmly in place. Motion is imparted to shaft *v* of cam-wheel V from any convenient source by a pinion, *w*, meshing with a gear-wheel, *x*, on the cam-wheel shaft, or in any equivalent well-known manner.

W W represent the hammers proper, preferably secured upon the beams or helves by set-screws, as indicated.

X X represent two vertically-adjustable rests or supports, one at each side of the lower hammer, to hold the work in position for the hammers to operate upon it when the two are used simultaneously. These rests each consist of a slotted plate moving in a seat or groove in the upright *c*, and provided with a rack, *y*, on one edge or face, to mesh with pinions *z*, secured upon a shaft or spindle extending from one upright *c* to and through the other, and furnished outside of the frame with a hand-wheel or handle by which to turn it to raise or lower the supports. If required, a pawl or like device may be employed to prevent the rest from descending under the weight of a heavy article or body of metal. The movement of the hammers being equal, the rests will ordinarily be so adjusted as to bring the object midway between them; but if it be desired to strike both faces, but one with greater force than the other, the rests will be adjusted to carry the article farther from the hammer which is to strike the harder blow than from the other.

Y represents a block pivoted in the frame A, and adapted to be turned up beneath the lower helve or beam, B, to form a support therefor in case only the upper hammer is to be actuated and the lower one used as an anvil, but which can be turned down to free the lower hammer when required, or to form a support for a separate anvil, if desired, in which case the upper hammer-head would be moved outward on its beam beyond the lower hammer-head, as indicated by dotted lines in Fig. 2. By this plan a wider range of movement of the hammer may be secured and a higher or lower anvil can be used to suit large and small objects. The spherical pivots prevent any cramping or binding, produce very little friction, and can be readily renewed.

It is apparent that the lower instead of the upper hammer may be arranged to act independently, that they may both be arranged to

work in other than a vertical plane, and that in other ways the details may be varied without departing from the spirit of my invention. By turning down the bolt *l* to or nearly to the face of the tail of spring F, the forward end of said spring is slightly elevated, and thus made to limit the descent of the upper hammer, so that when acting alone it will not quite come into contact with the lower hammer unless pressure be applied to the lower spring. By turning back the bolt *l* the upper hammer will be caused to fall with only its own weight unless the treadle be depressed; and by these adjustments the blow may be nicely regulated and controlled from an extremely light to a very heavy blow.

I am aware that it is not new to arrange and operate two hammers so that they shall strike simultaneously on opposite sides on an object, and hence I do not broadly claim such construction.

The machine may be operated without depressing the treadle at all, if very slight blows are desired; but where it is necessary to strike a heavier blow the treadle is depressed with whatever force or pressure is needed to give the desired blow.

Having thus described my invention, what I claim is—

1. In a trip-hammer, the combination of two hammers, actuating mechanism therefor, and intermediate connecting devices, substantially such as shown and described, between the two hammers, whereby they may be connected and caused to move in unison, or disconnected and one be actuated independently of the other.

2. In a trip-hammer, the combination of a frame, a hammer, a helve or beam for said hammer, and a pivot for the helve or beam, consisting of a ball or sphere seated in concave recesses in the helve-support and in a plate or block at the lower side of the helve, substantially as shown and described.

3. In combination with a supporting-frame, beams or helves B C and spherical pivots *f f* and *h*, all arranged to operate as set forth.

4. In combination with a supporting-frame, beams B C, spherical pivots *f f* and *h*, bearing-block D, composed of plates *i j*, interposed between the two beams, and removable pin E, for connecting and disconnecting the parts *i*, *j*, and C, substantially as and for the purpose set forth.

5. In combination with beam C, spring F, yoke *k*, cam G, arranged to bear against the rear end of the spring, and a treadle or lever connected with said cam, substantially as shown, whereby the force of the blow may be controlled without stopping the machine for adjustment.

6. In combination with beam B, pivoted block I, provided with spring L, yoke N, and cam M, arranged to bear against the spring, substantially as shown and described.

7. In combination with the rocking beams B C and intermediate cam-wheel, V, bearing-blocks *d e*, pivots *f f*, and shifting pivot *h*, all substantially as shown and described.

8. In combination with a supporting-frame, pivoted beams B C, springs F L, cams G M, arms P Q, pitman R, crank wheel or lever S, and treadle U, connected with said wheel, substantially as shown, for the purpose explained.

9. In a trip-hammer, the combination of two independent hammers, means for separating and releasing said hammers, springs for giving force to the blow of each hammer, cams arranged to act upon each spring and regulate the pressure thereof, and means, substantially such as described and shown, common to both cams, for operating them simultaneously and equally while the machine is in action, whereby the force of blow of both hammers may be equally and simultaneously controlled.

10. In combination with a trip-hammer having two vertically-movable hammer-heads, a vertically-adjustable rest or support for the work, substantially as shown and described, whereby the work may be brought exactly midway between the hammers, regardless of its height or thickness.

11. In combination with a trip-hammer having two separate heads arranged to move in opposite directions, substantially as described, a vertically-movable rest provided with a rack, and a shaft mounted in a fixed support and provided with a pinion to engage in and move the rack, and with a handle by which to turn the shaft.

12. In combination with a trip-hammer having two independent hammer-heads, a block pivoted in the frame, and adapted to be turned up to support one of said heads or turned down to release the same, substantially as set forth.

13. The combination of beams B C, provided with independent heads W, and tipping-block Y, the beam C being longer than beam B, and its head being adjustable upon the helve, substantially as shown and described.

14. In combination with frame A, beams B C, and cam-wheel V, an adjustable bearing-block, *s*, applied to one of said beams, substantially as and for the purpose explained.

15. The combination of beam C, cam-wheel V, spring F, yoke *k*, strap *m*, cam G, and bolt *l*, all arranged and operating substantially as described.

TOMPKINS TRIPP, JR.

Witnesses:
W. H. GILBERT,
E. P. KING.