

A. S. Upson.

Mit Mach.

N^o 9,288.

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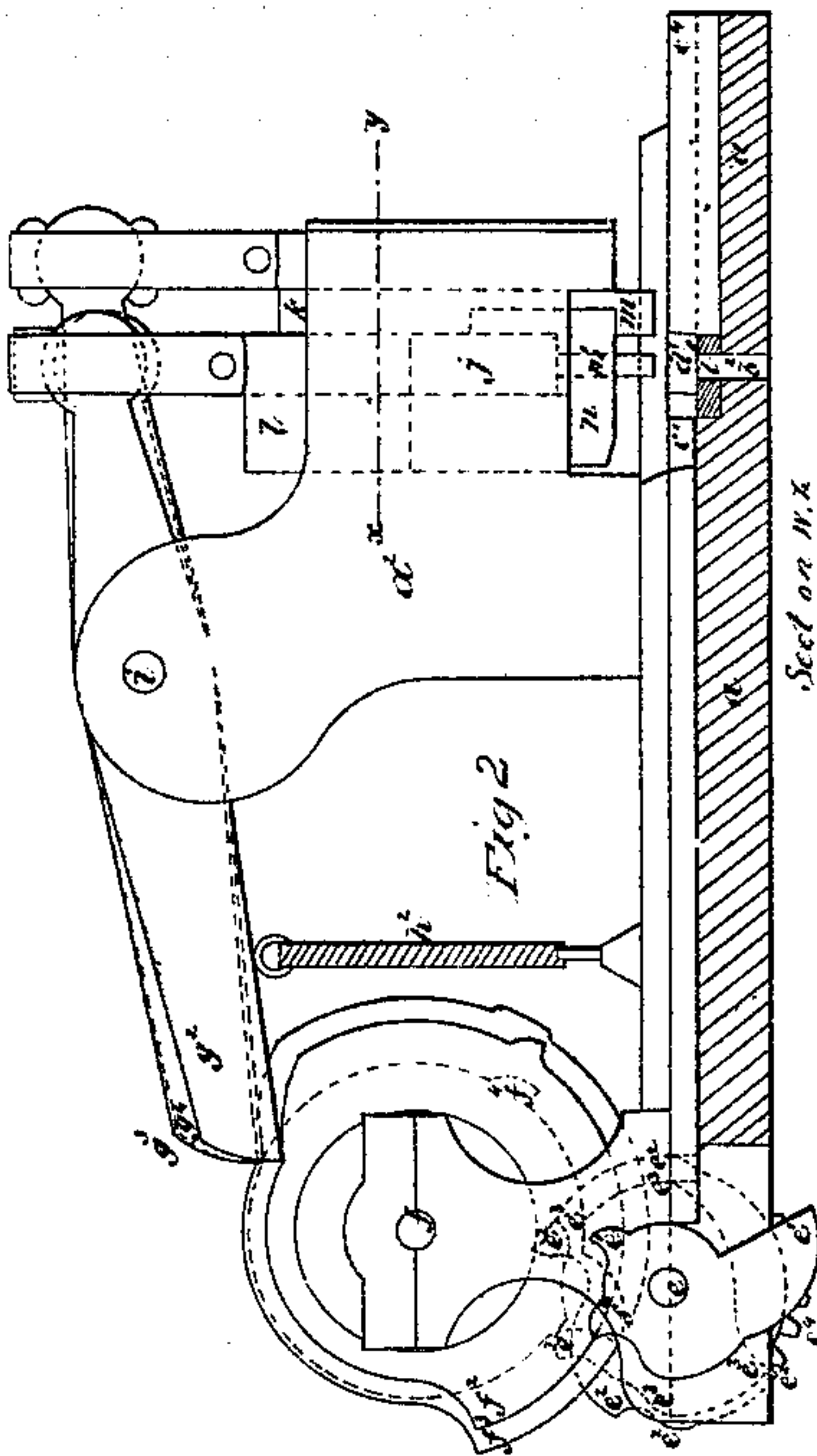
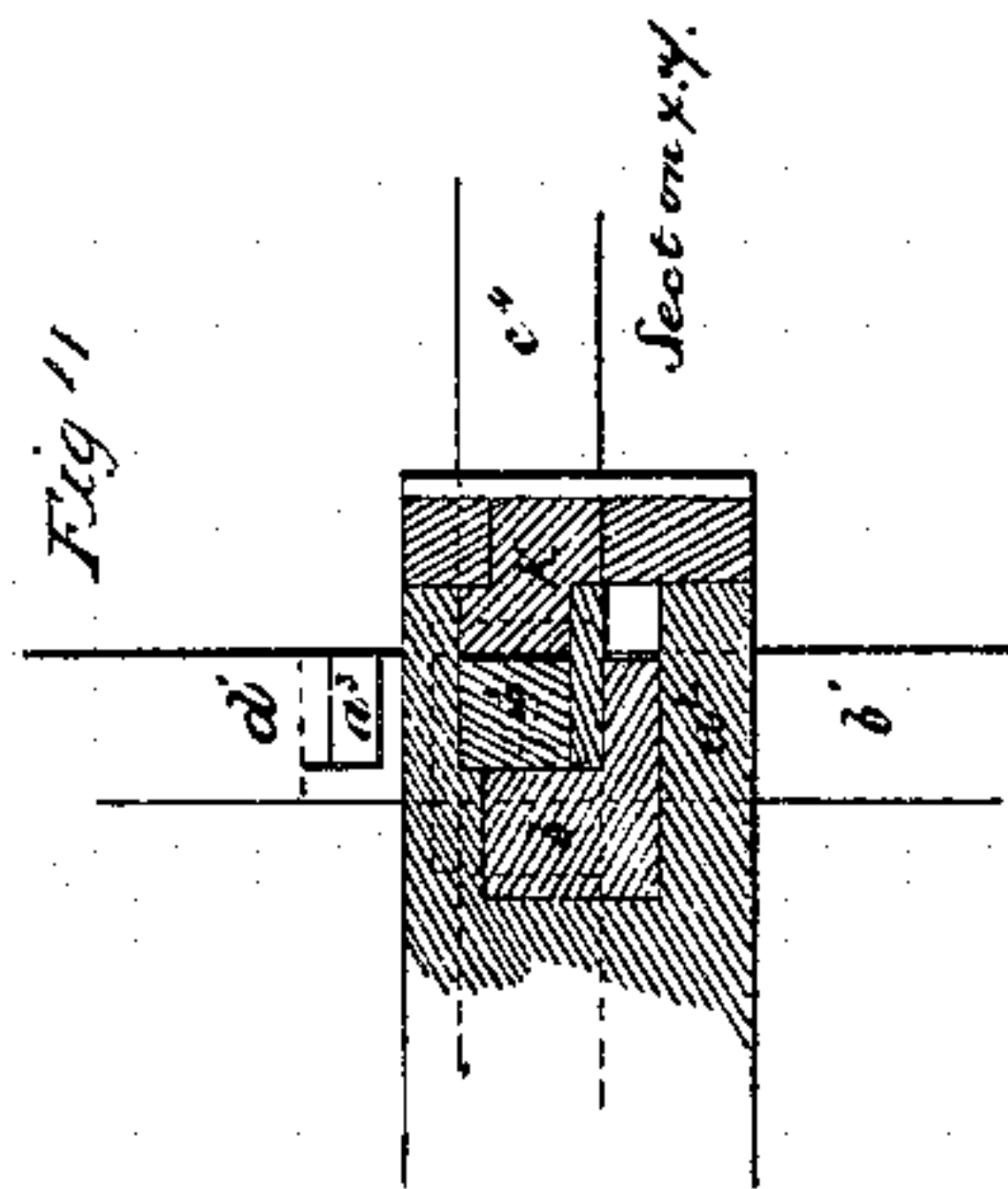
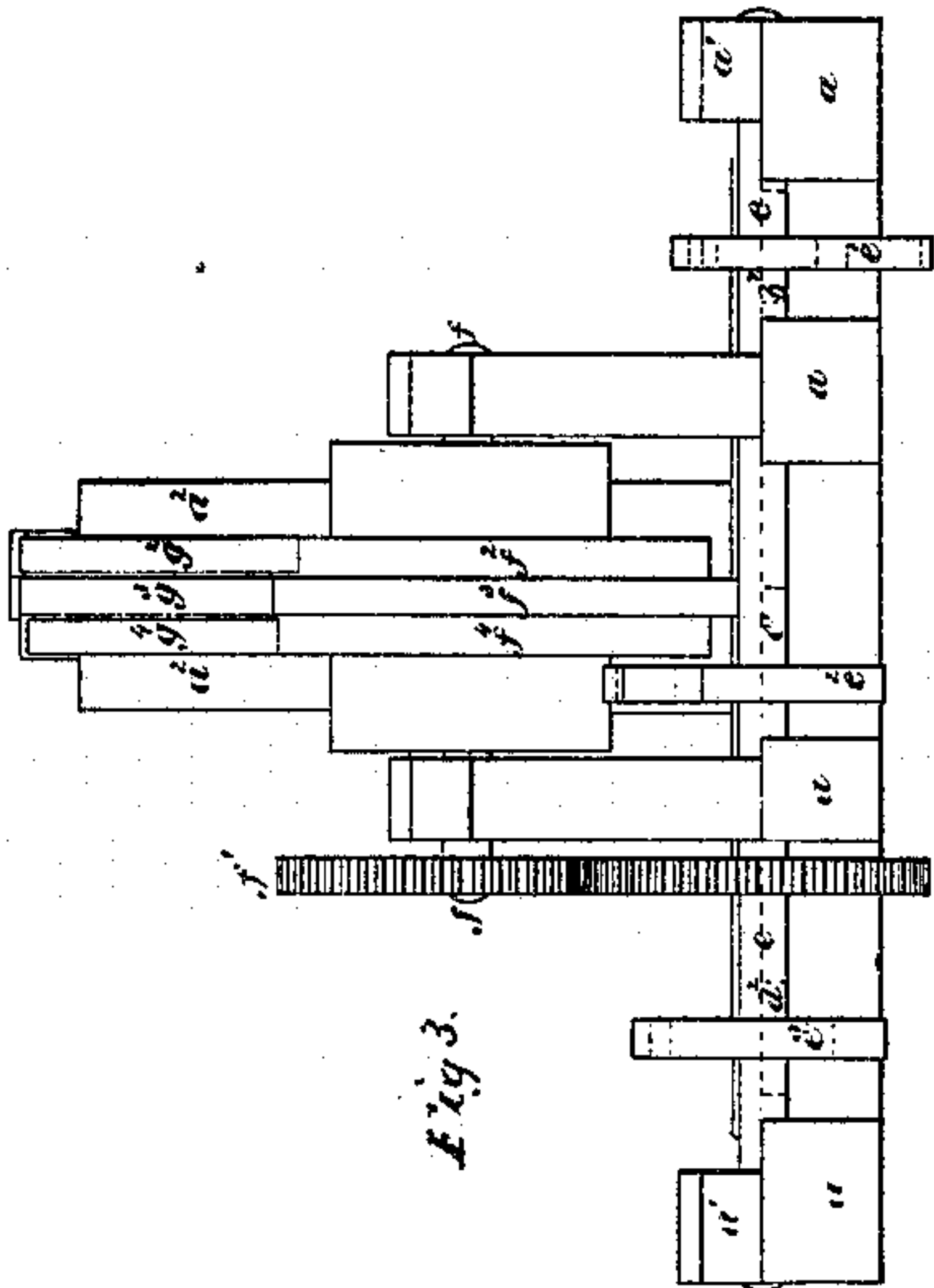
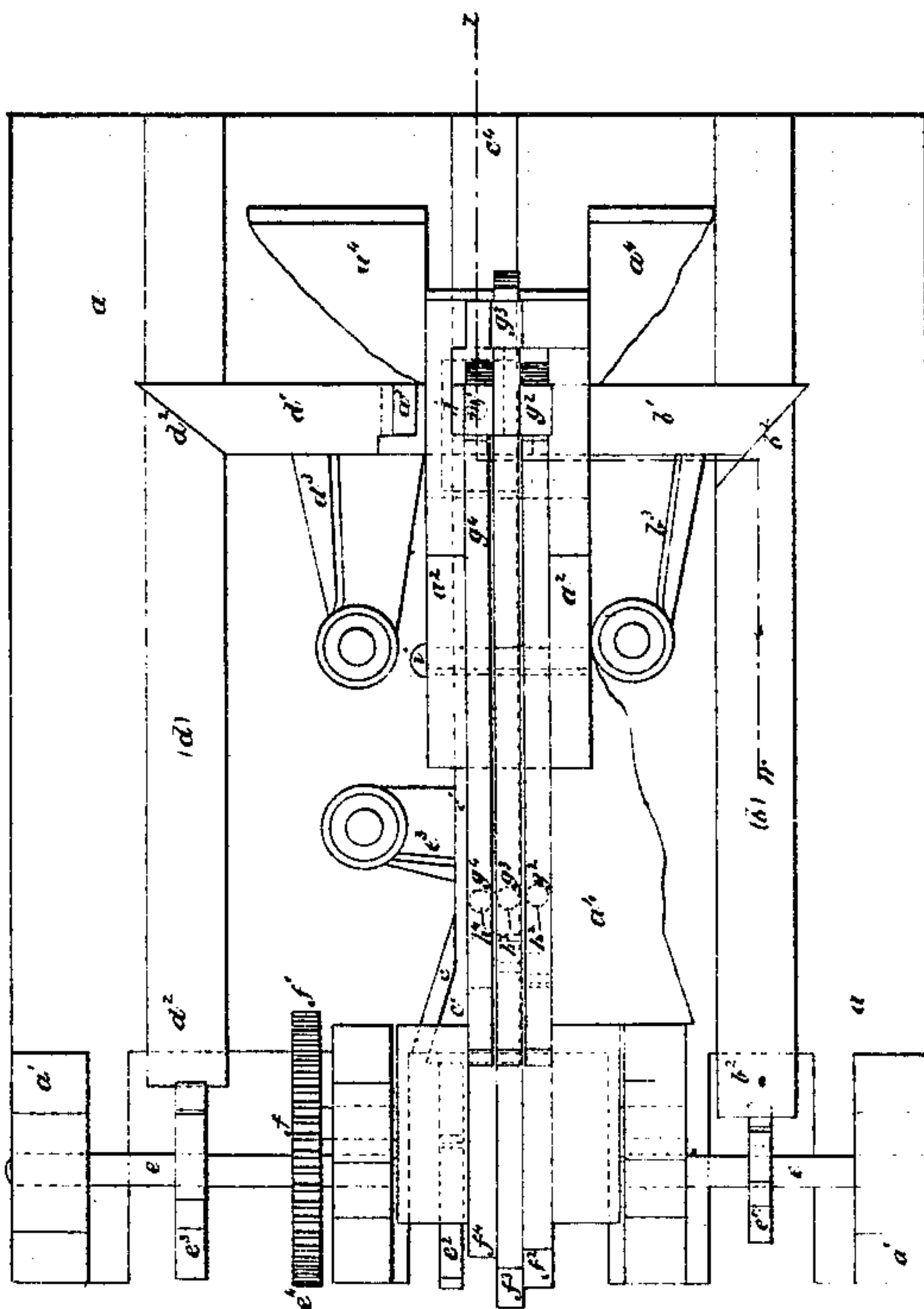


Fig 1



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ANDREW S. UPSON, OF UNIONVILLE, CONNECTICUT.

Letters Patent No. 91,288, dated June 15, 1869.

IMPROVEMENT IN MACHINES FOR MAKING METALLIC NUTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ANDREW S. UPSON, of Unionville, in the county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Nut-Machines, or Machines for Forging Metallic Nuts; and that the following, taken in connection with the annexed drawings, is a full, clear, and exact description thereof.

In the drawing—

Figure 1 is a plan of the machine, with part of the covering-plates removed, in order to exhibit the horizontal or edge swages or hammers, and the parts giving motion to the same;

Figure 2 is a side elevation, with part of the bed-plate in section, the section being taken on one side of the swage, which, at times, acts as a discharger of the finished nut;

Figure 3 is an end elevation; and

Figure 4 is a horizontal section through the stocks of the punch, shears, and top swage.

The object of this invention is to make a hammered or forged nut by machinery, without transferring or altering the position of the blank during the various operations that are performed upon it; and

The nature of the invention consists in the combination and arrangement of certain parts, in order to produce the desired effect, as hereinafter specified.

The machine may be made in various forms, and the various proper motions for the working-parts, or parts operating upon and to shape the blank, may be produced by any proper mechanical devices; the form of machine and devices for moving the working-parts, shown in the drawings, and hereinafter specially described, being those preferred by me.

In the drawings, the bed-plate of the machine is shown at *a a*. This bed-plate may be arranged on legs or a stand, and upon it are supported all parts of the machine. It is provided with grooves *b c d* upon its upper surface, in which work the edge swages or hammers and parts of the actuating-mechanism thereof, and has formed in it a hole, as at *a³*, through which the finished blank drops. This bed-plate carries standards *a¹ a¹*, supporting some of the cams and the countershaft on which they are mounted, and another standard, *a²*, forming the fulcrum-support of the levers actuating the punch, &c., and also carrying the guides in which the stocks of the punch-moving jaw of the shears, and the top swage slide.

At the rear end of the machine the main shaft *e* is supported in proper bearings. On it are mounted the cams *e¹ e² e³*, which actuate the edge swages, and also the gear-wheel *e⁴*. Above this shaft is secured the countershaft *f*, with a gear-wheel, *f¹*, driven by the wheel *e⁴*, and this shaft supports the cams *f² f³ f⁴*, upon the periphery of which the levers *g² g³ g⁴* rest, and are held by the springs *h² h³ h⁴*. These levers are supported by a fulcrum-pin, as at *i*, and the end of

each furthest from the cams is provided with links, or other proper devices, connecting each lever with a slide, moving vertically in proper guides or ways. These slides are the punch-stock *j*, moved by the lever *g⁴*, the stock of the movable jaw of the shears *k*, moved by *g³*, and the stock of the crowning or face-swage *l*, moved by *g²*. As the cams revolve, these stocks rise and fall, as hereinafter described.

In the grooves *b c d* slide the edge swages *b¹ c¹ d¹*, the former and latter being provided with inclined ends, which are acted upon by the inclined ends of the slides *b² d²*, which are, in turn, acted upon by the cams *e¹ e³*. These swages are retracted by the springs *b³ d³*, which, by their action, also keep the square ends of *b² d²* pressed against the peripheries of their cams.

The central edge swage *c¹*, whose ends at times act as a gauge, is actuated by the cam *e²* being forced against the cam by the retracting-spring *e³*.

The three end swages, and the slides which actuate two of them, are confined in the grooves by the covering-plates *a⁴ a⁴*.

The groove in which this swage *c¹* slides, is continued to the front of the bed-plate, as at *c⁴*, and the rod from which the blanks are cut is fed into this groove. The bottom of this part of the groove is lower than the top of the anvil *l¹*, which lies in the groove, and the moving jaw *m* of the shears is thus permitted to descend below the anvil, one edge of which forms the stationary jaw of the shears. The side of this moving-jaw at times acts as the anvil or rest, which supports the blank against the blow of the edge swage *c¹*.

The crown or top swage *n*, the bottom of which is a counterpart of the top of the nut, lies over the anvil, and the punch *m¹* plays in an aperture in this crown-swage, and drives the disk or button punched out of the nut into the hole *l²*, with which the anvil is perforated.

There is nothing new or unusual either in the shears, punch, crown-swage, edge swages, or anvil, considered separately, and out of their relations to each other, nor is there anything new in the means by which they are actuated, and for which other mechanical devices may be substituted.

When the relations to each other of the parts which act upon the blank are considered, it will be perceived that if they could all be made to touch the blank, at the same time, they would form a box, completely enclosing the nut, of which box the top swage is the top, the anvil the bottom, the three edge swages three sides, and the side of the moving-jaw of the shears the fourth side, while the punch would pass through the centre of the box. All parts, therefore, can and do act upon the blank while it lies in the same spot, and these parts may act upon the blank in any desired order or succession; but I prefer to so form the various cams that they act as follows upon a heated rod of iron shoved against the stop or

gauge, which, as before stated, is the end of the edge swage c' , and lying on the anvil:

First, the edge swages which act opposite to each other, come into position to steady the rod.

Second, the moving jaw of the shears descends, and also the crown-swage, the former cutting off the blank, and the latter giving it a slight shaping-blow.

Third, all the edge swages strike the nut a blow, and retreat.

Fourth, the crown-swage descends further, and retreats, shaping the top of the nut, while, at the same time, the punch descends, so as to prevent any part of the blank being forced into the hole in the crown-swage, through which the punch works.

Fifth, all the edge swages strike again, and retreat.

Sixth, the punch descends, punches the hole, and retreats.

Seventh, the shear-jaw and crowning swage and punch retreat to their furthest position from the nut, and the edge swage b' , acted upon by the highest projecting part of the cam e' , acts as a transferrer, and shoves the nut off of the anvil and over the hole a' , through which it drops. This edge swage retreats as soon as it has shoved the nut over the hole, and all parts then assume the positions shown in the drawings, so that the rod may again be forced forward, preparatory to the formation of another nut.

I have already said that the parts active in forming or forging the nut may operate in any desired order, and I also wish it to be understood that the number of times of operation may be varied; for instance, the edge swage may strike one or more blows, and so may the crown-swage. And not only may the order, but the relative time of operation be changed; for instance, the nut may be hammered while held upon the punch, and may be hammered on all sides at once, or on only two sides at a time, as specially described; but in all cases the blank is to occupy the same locality from the time of shearing to the time of completion.

I claim as my own invention—

1. The combination of the edge swages, crown-swage, punch, and shears, when so arranged, substantially as described, in relation to each other, as to act upon the blank lying in the same spot, while all the necessary operations upon it are performed.

2. In combination with edge swages, punch, crown swages, and shears, arranged as described, the aperture in the bed-plate or table, and the cam, to give additional motion to one of the edge swages, so that it acts as a transferrer to discharge the nut.

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