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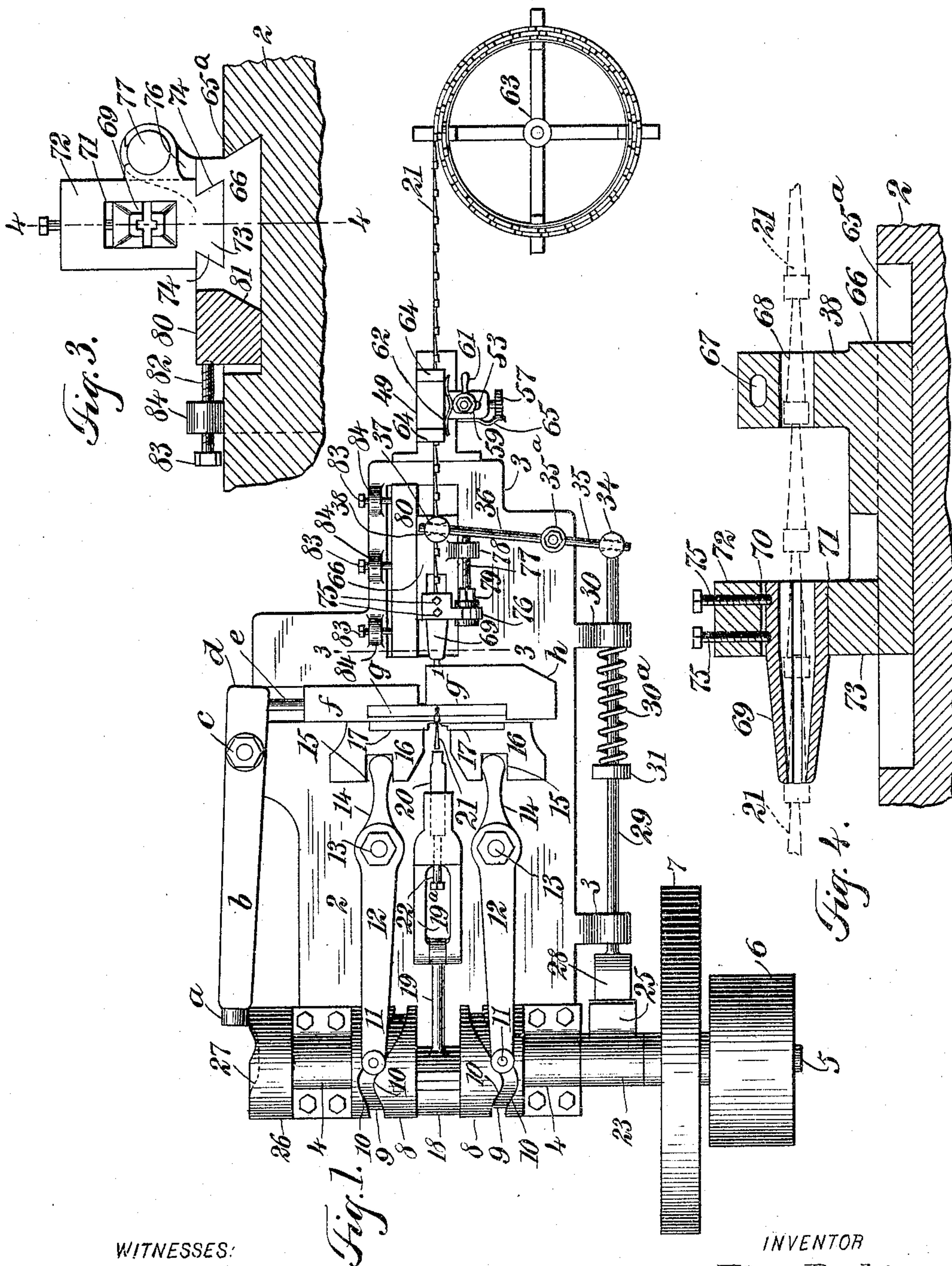
E. PERKINS.

MACHINE FOR SWAGING HEADS ON NAIL BLANKS.

APPLICATION FILED JULY 16, 1903. RENEWED OCT. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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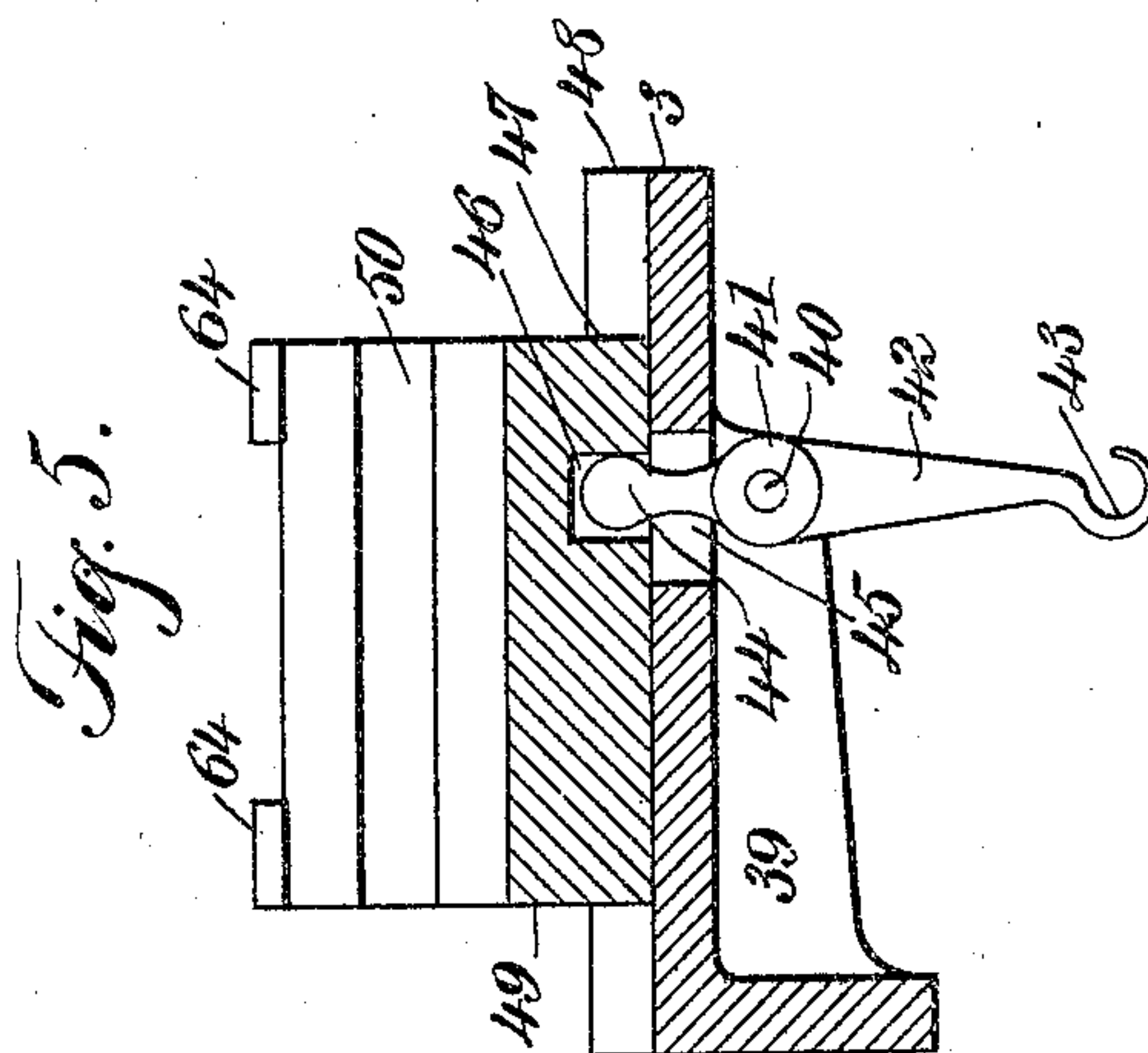
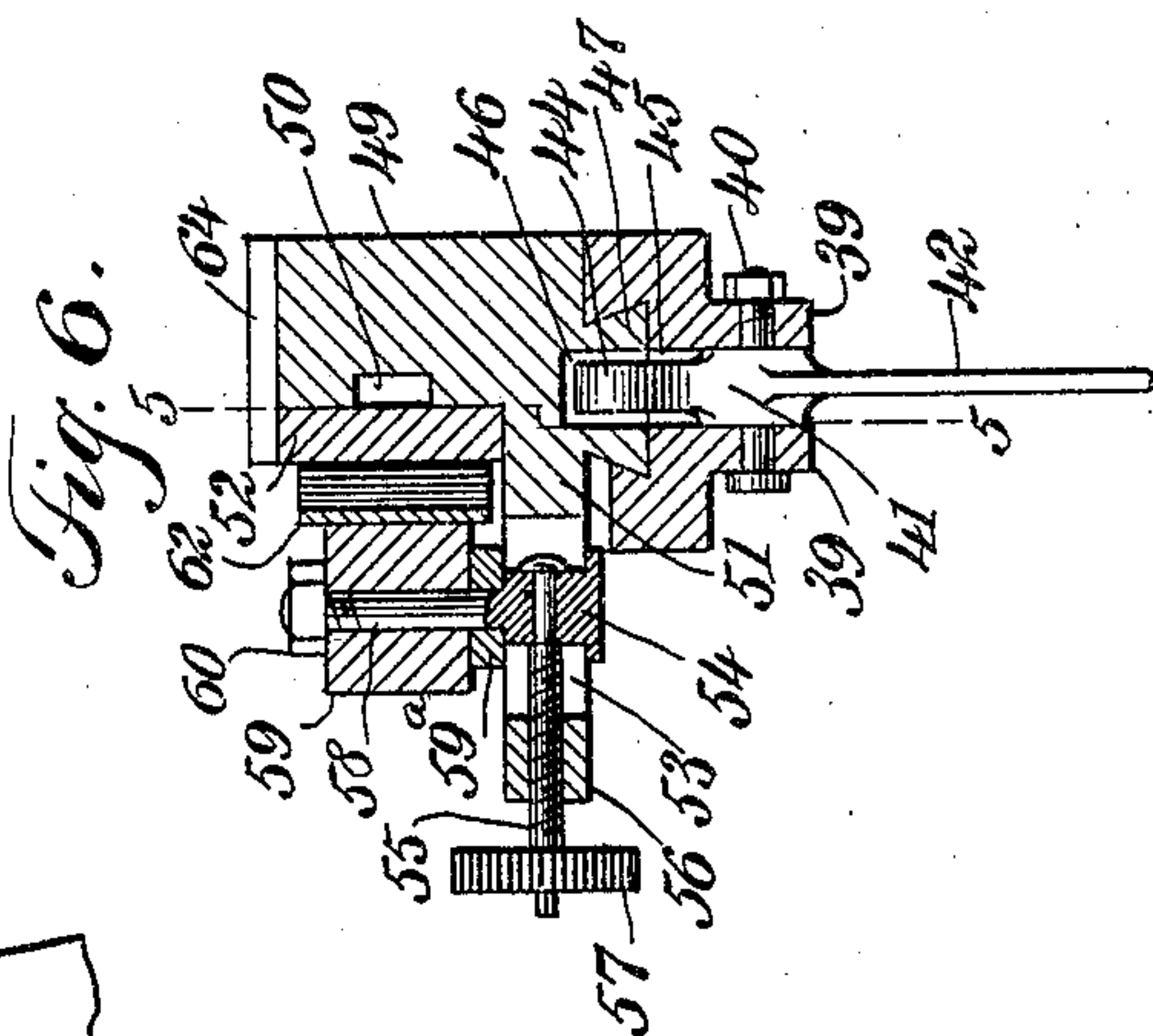
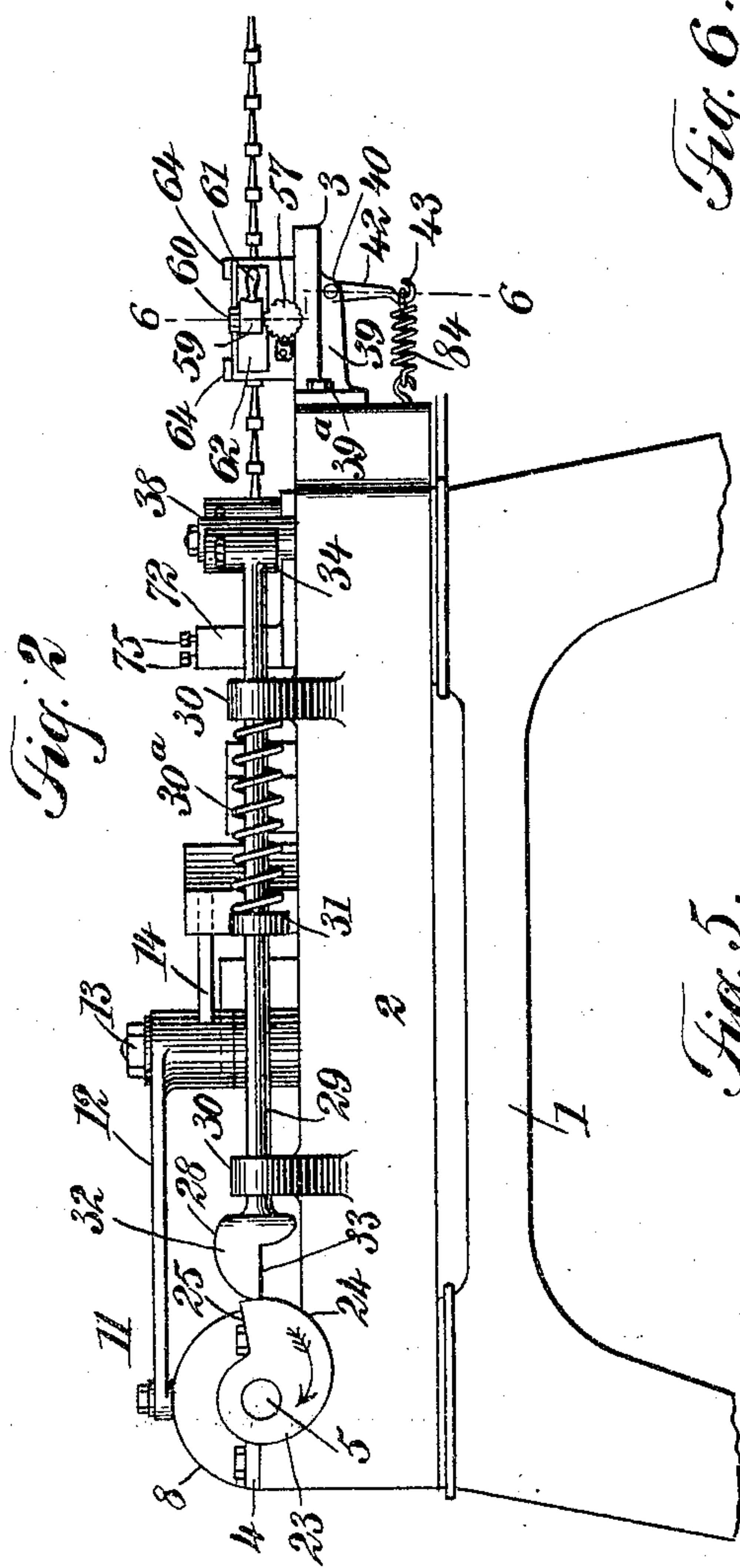
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UNITED STATES PATENT OFFICE.

EBEN PERKINS, OF ST. JOHN, CANADA.

MACHINE FOR SWAGING HEADS ON NAIL-BLANKS.

SPECIFICATION forming part of Letters Patent No. 775,499, dated November 22, 1904.

Application filed July 16, 1903. Renewed October 21, 1904. Serial No. 229,429. (No model.)

To all whom it may concern:

Be it known that I, EBEN PERKINS, a citizen of the United States, and a resident of St. John, in the Province of New Brunswick and Dominion of Canada, have invented a new and Improved Machine for Swaging Heads on Nail-Blanks, of which the following is a full, clear, and exact description.

This invention relates to machines for swaging heads on horseshoe-nail blanks; and it consists, substantially, in the construction, organization, and combinations of parts hereinafter particularly described, and pointed out in the claims.

One of the principal objects of my invention is to provide simplified and effective and reliable devices for upsetting or swaging the heads on horseshoe-blanks, which are fed to such devices in the form of a bar or wire previously rolled to constitute a continuous coil or length of blanks connected together head to point successively.

The above and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a top plan view of a machine embodying my improvements. Fig. 2 is a side view of the same minus the drive-pulley and fly-wheel. Fig. 3 is an enlarged transverse sectional view of certain parts taken substantially in the plane of the broken line 3 3 in Fig. 1. Fig. 4 is an enlarged vertical longitudinal sectional view taken on the broken line 4 4 in Fig. 3. Fig. 5 is an enlarged vertical longitudinal sectional elevation taken on the line 5 5 of Fig. 6, and Fig. 6 is an enlarged vertical transverse sectional view taken on the line 6 6 of Fig. 2.

Before proceeding with a more detailed description it may be stated that in the form of my improvements herein shown I employ a suitable bed-plate or table upon which the several operative devices of the machines are mounted, said devices being compactly organized and so timed in their workings as to perform the desired results most effectually. The nail-blanks are fed to the machine in continuous manner from a suitable source, and

I employ tension devices therefor of special construction and organization, combined with which are specially-devised feed devices for the blanks, these two sets of devices cooperating with each other in a manner to successively present the blanks to suitable heading devices therefor, it being mentioned that each blank is preferably severed or cut off immediately preceding the final step of the heading operation. The tension devices herein referred to operate to prevent the blank-wire from being carried too far forwardly at each intermittent forward movement of the gripping devices, and on each release of the blank-wire from said gripping devices the said tension devices perform the additional function of forcibly seating the foremost blank within the dies, which partly constitute the heading devices for heading or upsetting the nail-blanks at one end.

The construction and operation of the different elements or parts will be fully explained later on, and while I have herein represented my improvements in a certain preferred embodiment it will be understood, of course, that I am not limited to the precise details thereof in practice, since immaterial changes therein may be resorted to coming within the scope of my invention.

Specific reference being had to the drawings by the designating characters marked thereon, 1 represents a suitable support upon which is placed a bed-plate or table 2, formed or provided at one end thereof with an extension or shelf 3 and having at its other end suitable bearings 4 for a main operating-shaft 5, having thereon a driving-pulley 6 and a balance-wheel 7, said shaft also having rigid therewith two cams 8, having reversely-disposed cam-grooves 9 therein, the edges 10 of which are made up of substantially parallel compound curves, as shown, and working in said grooves are suitable pins or other devices 11, carried at the outer ends of the longer arms of practically duplicate levers 12, pivoted at 13 to move or swing in a horizontal plane, the free ends of the shorter arms 14 of these levers being disposed to work in recesses 15, formed in the adjacent vertical faces of transversely-slidable blocks 16, to the opposite faces of

which are attached suitable cutters or knives 17, to be referred to hereinafter. Intermediate the said cams 8 the shaft 5 is provided with an eccentric 18, to which is connected one end of a reciprocatory rod 19, the other end of which has movably connected thereto a yoke 19^a, which carries a suitable tool 20 for effecting the upsetting of the enlarged end of each nail-blank 21 to form the head thereon, said tool being preferably provided with any suitable means 22 for adjusting the same, according to varying requirements in use.

Carried by the shaft 5, preferably beyond one side edge of the bed-plate or table 2, is a cam 23, formed with a tooth 24, having a straight edge 25, while on the end of said shaft corresponding to the opposite side edge of the bed-plate is located a head 26, having a curved cam-surface 27, formed on the outer face thereof, as shown. (See Fig. 1.) The tooth 24 of said cam 23 coöperates with the head 28 of a connecting-rod 29, having its support in bearings 30, projecting from the bed-plate, a part of said rod being surrounded by a retracting-spring 30^a for the latter, exerting its tension between a collar 31 on the rod and one of the said bearings, the said head 28 also having a tooth 32, formed with a straight edge 33, and the opposite end of the said rod being in movable connection at 34 with the shorter arm 35 of a horizontally-swinging lever pivoted at 35^a and the longer arm 36 of which is in connection at 37 with a pillar or post 38 of the feed devices presently referred to. The said curved cam-surface 27 operates upon the rounded end *a* of a laterally-swinging lever *b*, pivoted at *c* to a projection of the bed-plate 2 and the end of the shorter arm *d* of which is movably connected at *e* with the outer end of a transversely-slidable jaw *f*, carrying one of the two dies *g g'*, with which the tool 20 coöperates in heading or upsetting the forward end of each nail-blank, the other end of said dies *g'* being supported by a stationary jaw *h*, suitably fastened in position upon the said bed-plate.

Beneath the hereinbefore-mentioned shelf 3 are practically duplicate parallel stationary members 39, secured in place at 39^a and between which is pivoted at 40 a forwardly and rearwardly swinging vertical lever 41, the lower end of the longer arm, 42, of which is preferably provided with or shaped into a hook 43, and the shorter arm, 44, of which passes upwardly between the sides of a slot 45, formed in said shelf 3, with the end of this arm working between the end walls of a notch 46, formed in the under side of a dovetailed tenon 47, slidably fitting between the sides 48 of a correspondingly-shaped groove formed in the upper surface of said shelf 3, as shown, said tenon being rigid with the under side of a block or plate 49, the inner vertical face of which is formed with a longitudinal channel or groove 50, and supported on a ledge 51 of

this block or plate is the lower edge of an additional block or plate 52, the inner vertical face of which fits against the corresponding face of the said first-named block or plate 49, as shown. (See Fig. 6.) The said ledge 51 is formed therethrough with a slot 53, in which works a slide 54, in which is fitted the plain and headed portion of a screw-rod 55, which works in the end portion 56 of the ledge, and is provided with a milled operating-head 57 to enable said rod to be readily turned. Standing upwardly from the said slide is a pin 58, on which is fitted a cam 59, beneath which is preferably located a washer 59^a, and which cam is held on the pin by means of a nut 60, screwing on the upper end of the latter, said cam being provided with an operating-handle 61, (see Figs. 1 and 2,) by which to enable the same to be turned to cause a tension-regulating spring 62 to bear with greater or less pressure against the outer vertical face of the said block or plate 52, and thus may the force with which the tension devices (blocks or plates 49 and 52) take hold of the continuous lengths of blanks 21 be regulated, it being understood that said blanks are successively paid out from a reel or other device 63, upon which they are wound in suitable lengths, the blanks having been previously reduced to the form shown, with that part which is to constitute the head of each somewhat larger than the remainder thereof, as shown. It may be stated that the said tension block or plate 52 is prevented from upward displacement by guides 64 therefor at the upper part of the said block or plate 49 and also that a spring 65 is preferably provided for engaging the milled edge of the operating-head 57 of the screw-rod 55 to hold the latter in different positions of adjustment.

Located forwardly of the tension devices just described and working in a dovetailed recess 65^a therefor, formed in the bed-plate 2, is a tenon formed with a forwardly and rearwardly slidable stock 66, at the rearward end of which the aforesaid pillar or post 38 is mounted, said post having therein an opening 67 for connection therewith of the end of the before-mentioned lever-arm 36, and formed through this post in the line of movement of said stock is another opening, 68, between the sides of which the continuously-connected blanks 21 pass and are guided to and through a pair of spring-grippers 69, the rearward parts of which are supported laterally in grooves 70, formed in the opposite sides or faces of an enlarged opening 71, formed longitudinally through an auxiliary stock 72, having on the under side thereof a substantially dovetailed tenon 73, fitting between the sides 74 of a correspondingly-shaped groove therefor in the upper surface of said stock 66, the said grippers 69 being constructed for the passage longitudinally therebetween of the foremost ones of said connected nail-blanks, (see Figs. 13

1 and 4,) the grippers being also held in place adjustably by means of screws 75, passing downwardly through openings therefor in the upper part of said auxiliary stock, as shown.

5 In order to provide for the independent longitudinal adjustment of said auxiliary stock, I form the latter at one side with a projecting arm 76, through an opening (not shown) in which passes the headed end of a screw-bolt 10 77, the threaded portion of which works in a corresponding opening (not shown) therefor in a projection 78 on the same side of the main stock 66, said bolt having nuts 79 thereon for retaining the same at different adjustments.

15 Suitable adjustable retaining devices may be employed for the main stock 66, consisting in the present instance of a block 80, seated in a recess 65^a at one side of said stock and having its inner edge or face beveled at 81 in 20 conformity with the shape of the adjacent side of the tenon of said stock, this block being capable of being adjusted laterally with reference to the stock by means of the screws 82, having heads 83 and working in suitable 25 openings (not shown) therefor in projections 84 on the bed-plate, it being noted at this point that the hooked end 43 of the longer arm 42 of the forwardly and rearwardly swinging lever 41 has connected thereto one 30 end of a spring 84, having its other end secured to the base-plate. (See Fig. 2.)

In operation the foremost ones of the connected nail-blanks are first started through the tension devices, and upon the lever-arm 36 having a forward swinging movement imparted 35 thereto from the rod 29, which, as is understood, is operated from the cam 23, the main stock (carrying the auxiliary stock properly adjusted with reference thereto) is carried forwardly therewith, and likewise the spring-grippers are also carried in the same direction, advancing all the blanks substantially the distance of one of them, the tension devices being also drawn forwardly in the 45 recess therefor in the shelf 3, such forward movement of said devices being due to the frictional hold they have upon some of the blanks and being also against the pressure of said spring 84. The nose or forward end of 50 the grippers successively engages behind the enlarged ends of the blanks in the forward movements of said grippers, and the foremost ones of the blanks are thus successively carried to position between the dies *g* and *g'*, 55 whereupon the movable die is operated toward the stationary die by the cam-surface 27 and the lever *b*, the shank of the blank being thus loosely inclosed in the recessed ends of said dies, the head of said blank having been 60 moved sufficiently in advance of said dies to prevent it from interfering with the closure of the dies upon the shank. At this period of the operation the tooth 24 of the cam 23 passes the tooth 32 of the head 28 of said rod 65 29, whereupon the reaction of the springs 30^a

and 84, (both of which have just previously been placed under tension, as is apparent,) causes the grippers to be moved rearwardly by the reverse operation of the lever-arm 36, while the tension devices are retracted suddenly, which latter action draws the said foremost one of the blanks rearwardly, thereby causing the enlarged end thereof to become seated in the recesses of said dies, the rounded end *a* (or roll thereon, if desired) of the lever 75 *b* now riding or mounting the projecting cam-surface 27 of the head 26, thus finally closing the dies firmly on the shank of the nail-blank, preventing the latter from sliding backwardly under the heavy pressure of upsetting the 80 head, immediately succeeding which the tool 20 is advanced to upset the said enlarged end of the blank to form the head thereon. On the next succeeding movement of the grippers, together with the tension devices, as just described, the blank previously operated upon 85 to be headed is severed or cut off by means of the action of the cutters 17, while the enlarged part of the blank immediately following will have been advanced slightly beyond 90 the dies, as in the first instance, whereupon the reverse operation of the grippers and tension devices takes place, as before, and so on. As soon as the tension devices are started to be retracted the foremost blank is moved 95 slightly rearwardly therewith, as will be apparent; but for all the remainder of their rearward movement such devices slip over the succeeding connected blanks due to the resistance afforded by the engagement of the 100 enlarged portion of the foremost blank by the dies.

For reasons already stated it is important for the enlarged end of the blank to be in firm engagement with the dies when the heading 105 process begins, and in a machine of this character it is a practical impossibility to feed the series of blanks forward with such exactness and precision as to secure this result. Hence I have adopted the method herein set forth of 110 moving the foremost blank slightly in advance of the die and then of forcibly returning it to its exact position against the dies after they have been sufficiently closed upon the shank to form a stop for the enlarged end 115 of the blank when that position has been reached.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for heading nail-blanks, the 120 combination with a pair of dies, and a tool, constituting heading devices for the blanks, of devices for successively feeding beyond the dies the enlarged end of the foremost one of a series of connected blanks, tension devices for 125 the blanks, adapted to be moved forwardly by the latter and said feed devices, means for suddenly retracting said tension devices on the return movement of the feed devices to impart a slight rearward movement to said series 130

of blanks to bring the forward blank into engagement with the dies, and means for severing said foremost blank on the completion of the next succeeding forward movement of the feed devices.

2. In a machine for heading nail-blanks, feed devices comprising grippers, a slidable stock, and an independently-adjustable auxiliary stock, in which the grippers are supported.

3. In a machine for heading nail-blanks, feed devices, comprising grippers, a slidable stock, having a projection at one side, and an auxiliary stock, carrying adjusting devices therefor, including a screw working in said projection, the grippers being carried by said auxiliary stock.

4. In a machine for heading nail-blanks, feed devices comprising a movable reciprocating main stock, formed in its upper surface with a dovetailed recess, an auxiliary stock having a tenon fitting in said recess, and means for adjusting said auxiliary stock relatively to the main stock, the former being provided with spring-grippers for the blanks.

5. In a machine for heading nail-blanks, tension devices comprising a slidable block having a longitudinal groove, a spring-pressed block cooperating with said slidable block to grip the series of blanks, whereby the tension devices are carried forward with the series of blanks as said blanks are moved forward, means for suddenly retracting said tension devices after each forward movement of said series of blanks to cause the tension devices to give a sharp rearward pull upon said series of blanks.

6. In a machine for heading nail-blanks, tension devices comprising a support having a recess, a grooved block working in said recess and having a ledge, a spring-actuated lever pivoted to the support and engaging said block for imparting longitudinal movement thereto, a spring-pressed plate engaging the face of said block, and a cam-lever adjustably mounted on the ledge and engaging said spring for imparting tension thereto.

7. In a machine for heading nail-blanks, the combination with heading devices, of feed devices for a series of connected blanks, tension devices adapted to move forwardly with said feed devices, and means for suddenly retracting these latter devices on the return movement of the feed devices.

8. In a machine for heading nail-blanks, the combination with heading devices, of feed devices for a series of connected blanks, tension devices arranged and adapted to be operated by the blanks, to move forwardly with said feed devices, and means for suddenly retract-

ing these latter devices on the return movement of the feed devices.

9. In a machine for heading a series of connected nail-blanks, tension devices adapted to frictionally engage said series of blanks to be successively moved first forwardly thereby and then to be suddenly retracted thereupon, the frictional contact of the parts remaining constant, said tension devices including a slidable member having a notch in the under side thereof, a pivoted lever having one end working in said notch, and a spring connected with a fixed part of the machine and engaging the other end of said lever to resist the forward movement of said member.

10. The combination with means for heading nail-blanks from a continuous coil or length of the same joined together head to point, of a feeding device for successively feeding forward the enlarged end of the foremost one of said series of blanks, a tension device for then imparting a slight return movement thereto and means for gripping the shank of said forward blank first loosely upon the forward movement of the series, to allow the resetting of such blank in the dies therefor by the return movement of said series, and then to firmly hold the blank in position for heading.

11. The combination with means for heading nail-blanks from a continuous coil or length of such blanks successively joined together head to point, said means including holding devices, of a feeding device provided with spring-grippers having means for independent longitudinal adjustment by which to successively feed forward to a position beyond the holding devices, the enlarged end of the foremost one of such blank series, and means for suddenly retracting said foremost blank.

12. The combination with means for heading horseshoe-nail blanks from a continuous coil or length of such blanks joined together head to point, such means including a pair of gripping-dies, of a device for successively feeding the blanks, a cam for effectively closing the gripping-dies, a tension device, and a spring-actuated lever for suddenly retracting this device, together with the blank series, on the return movement of such feeding device substantially and for the purpose shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EBEN PERKINS.

Witnesses:

A. F. BARKER,
CHAS. O. McINTOSH.