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J. J. UNBEHEND.

MACHINE FOR SLOTTING RIVET SHANKS.

No. 381,514. Patented Apr. 17, 1888.

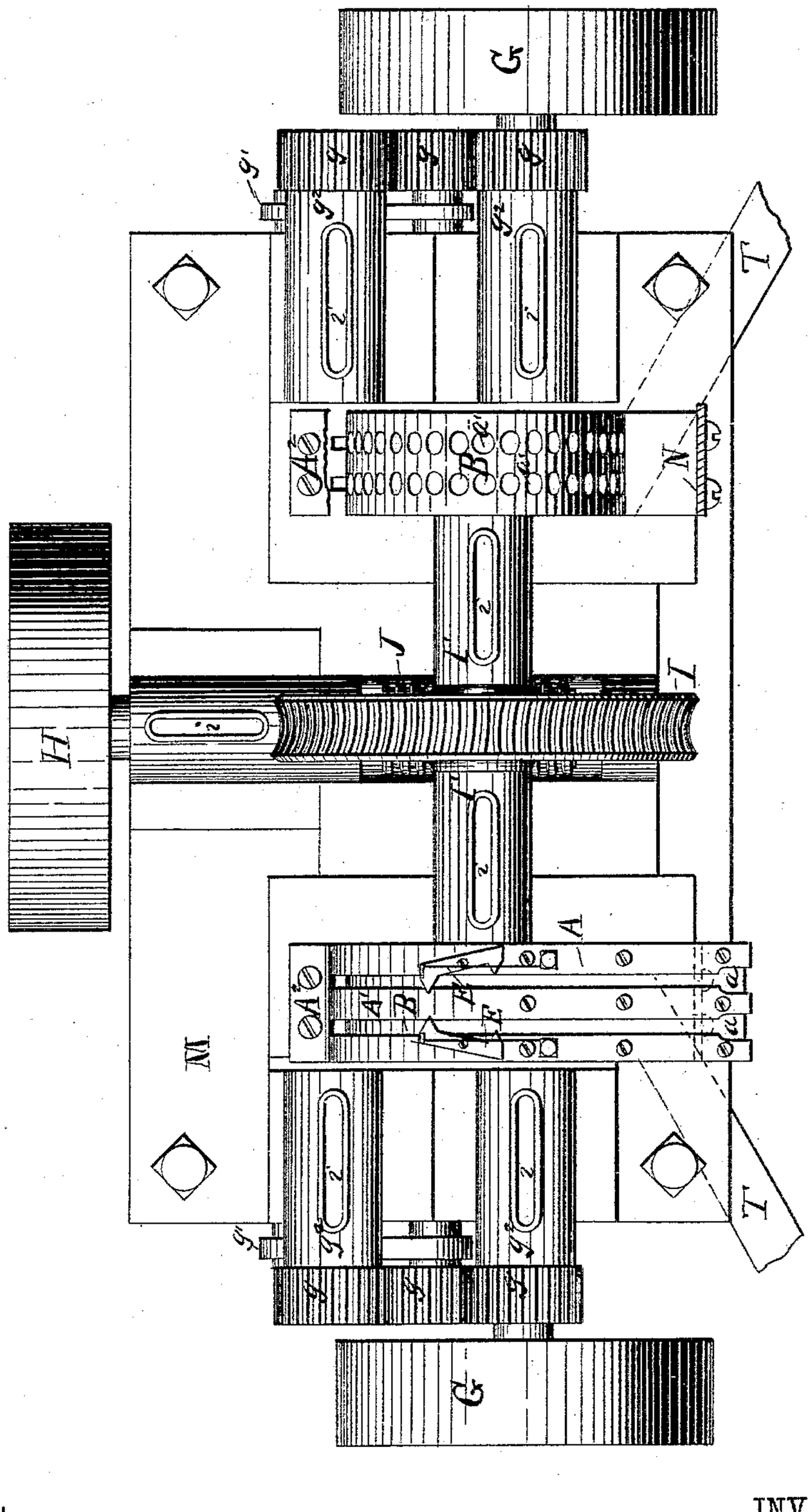

Fig. 1.

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J. J. UNBEHEND.

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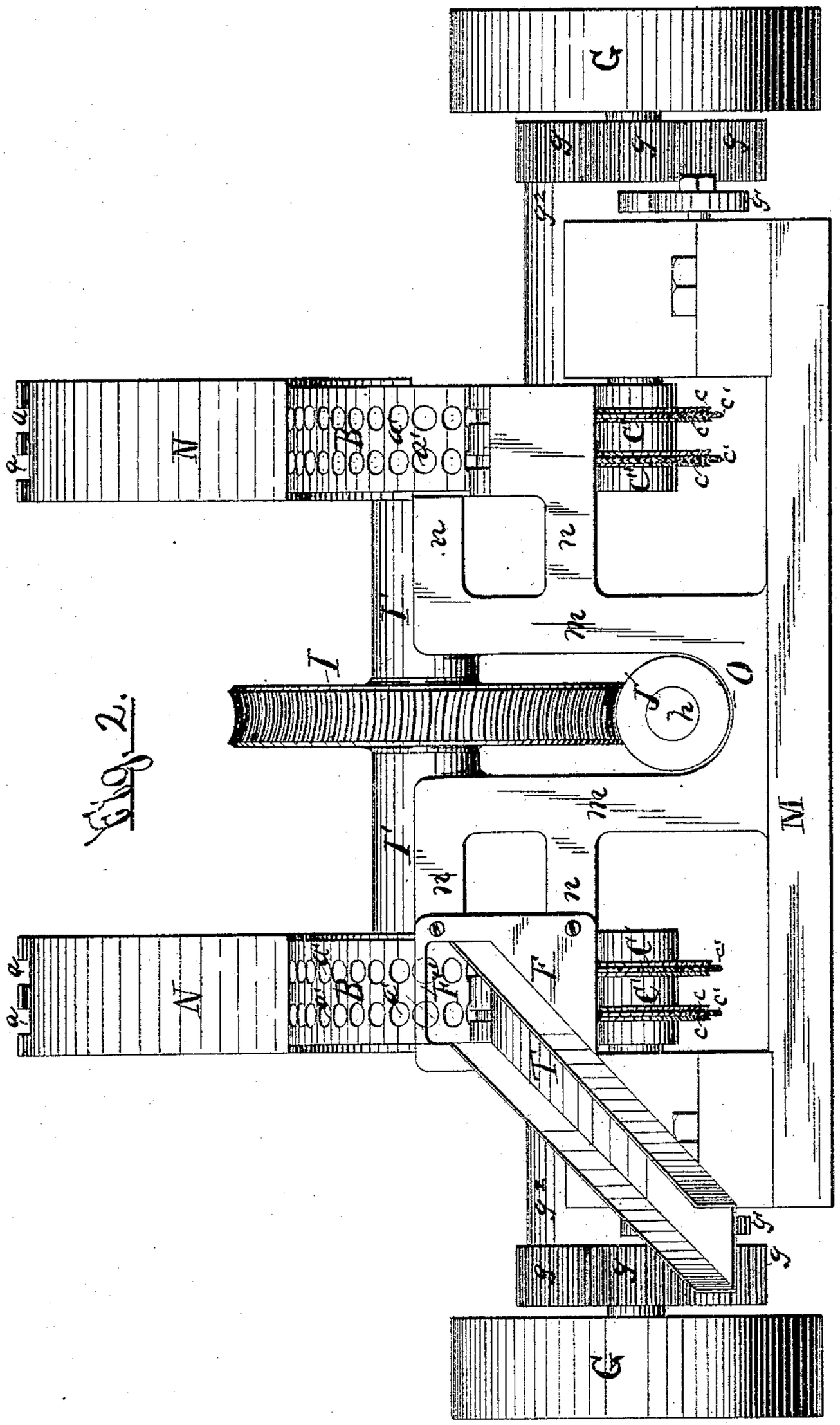

Fig. 2.

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Fig. 4.

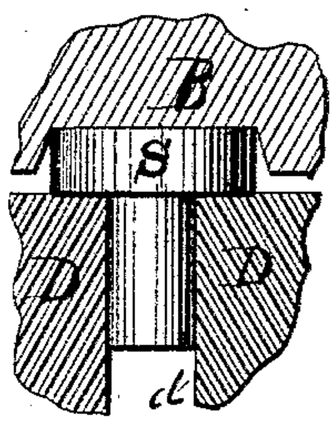

Fig. 3.

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MACHINE FOR SLOTTING RIVET SHANKS.

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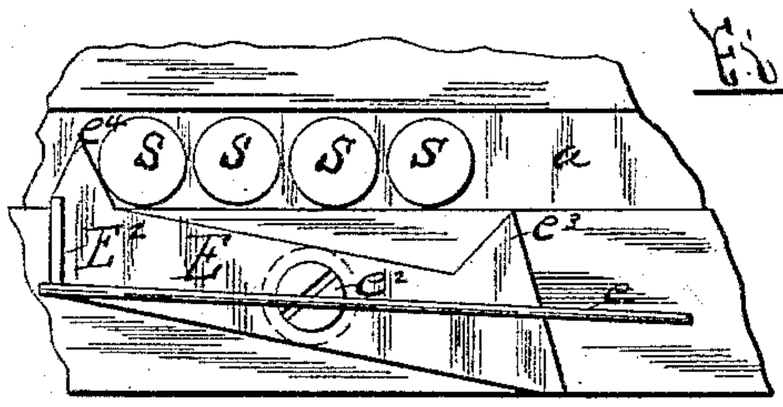
Fig. 8.



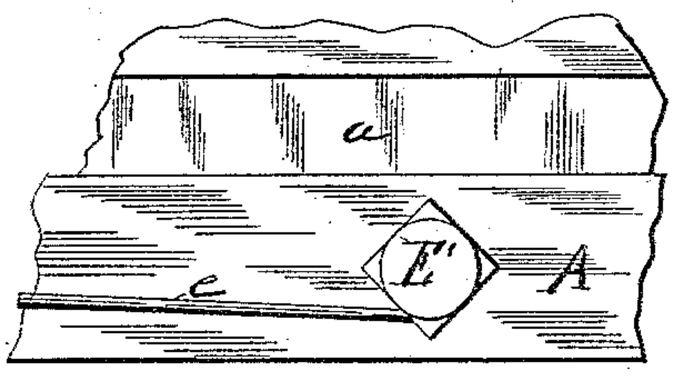
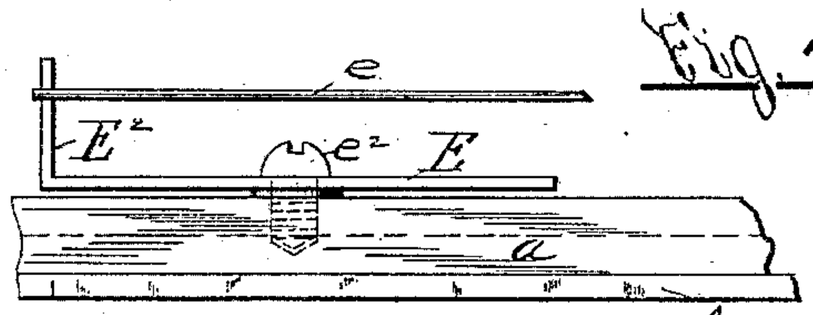


Fig. 7.



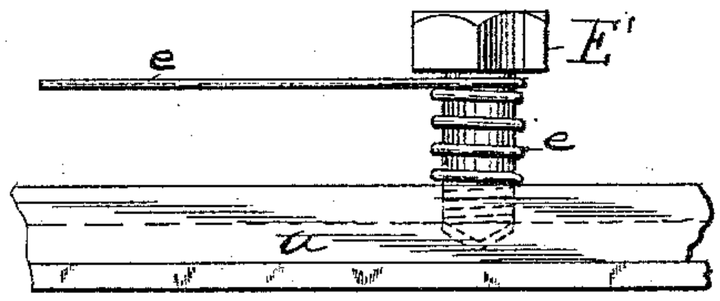


Fig. 6.

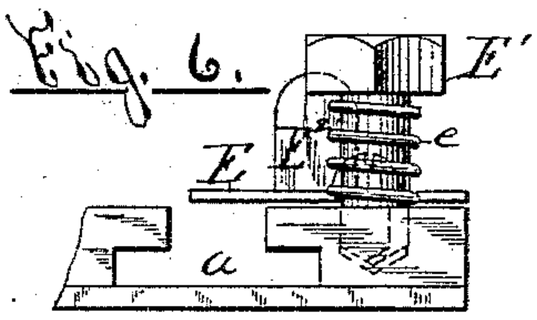


Fig. 5.

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MACHINE FOR SLOTTING RIVET SHANKS.

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Fig. 9.

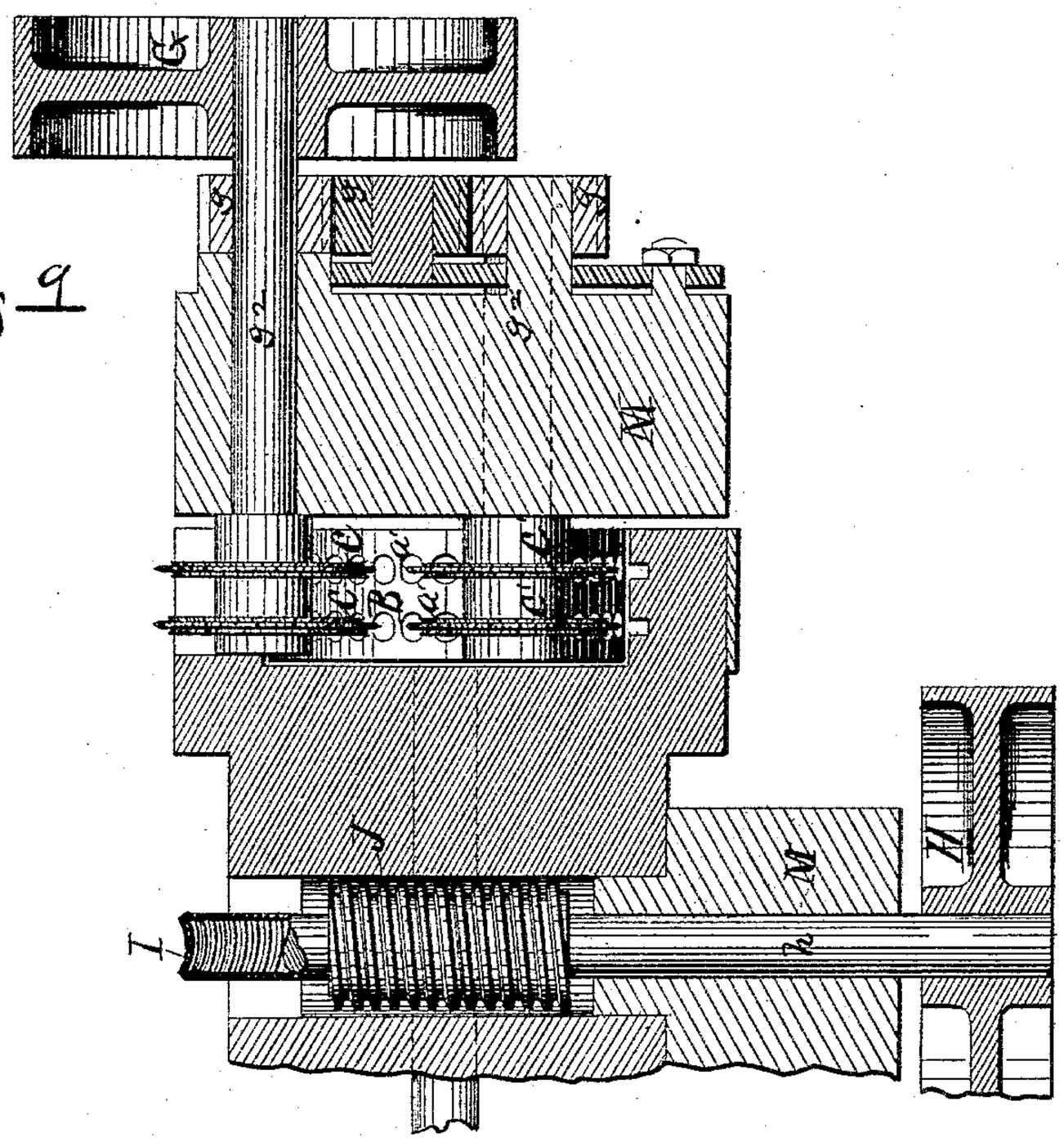


Fig. 10.

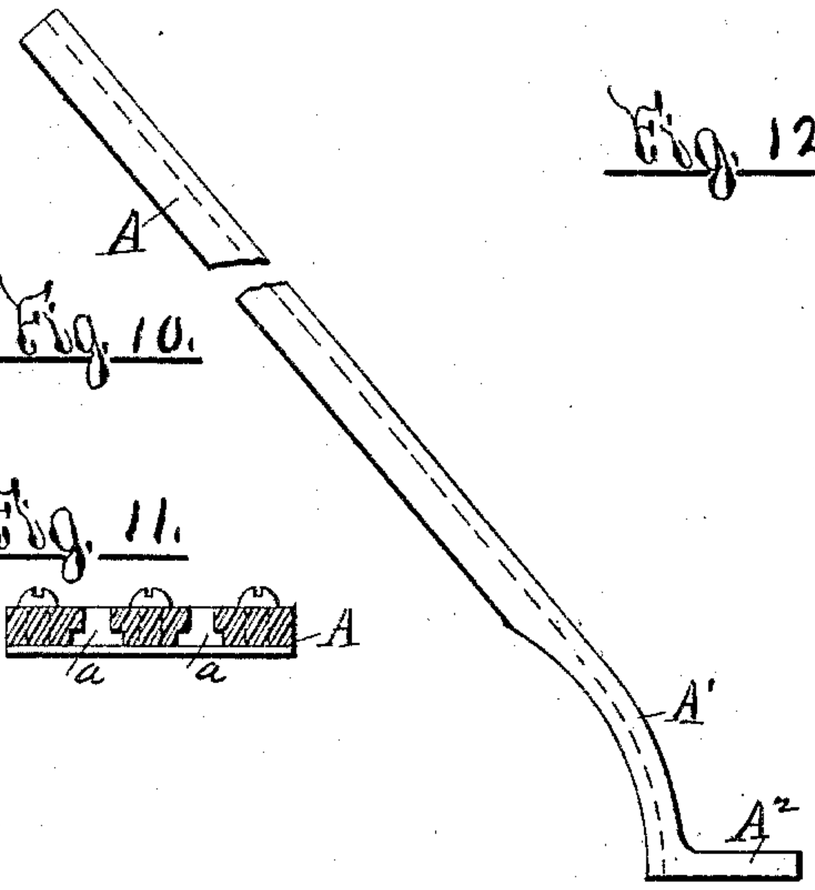
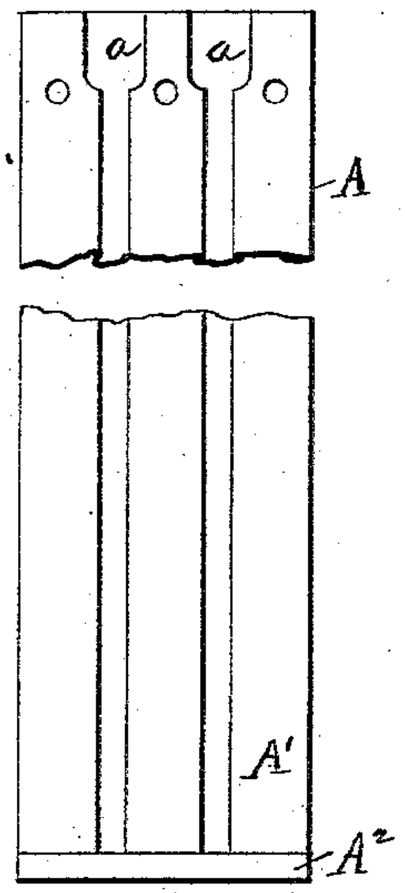


Fig. 11.

Fig. 12.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR SLOTTING RIVET-SHANKS.

SPECIFICATION forming part of Letters Patent No. 381,514, dated April 17, 1888.

Application filed December 27, 1886. Serial No. 222,666. (No model.)

To all whom it may concern:

Be it known that I, JACOB J. UNBEHEND, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Milling or Slotting Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention has for its object the production of a machine in which rivet-blanks of metal may be inserted and automatically fed consecutively into a holding device in which the said blanks are securely held while being bifurcated or slotted and their clinching-prongs pointed simultaneously with great speed and uniformity of operation, the idea being to produce a machine for the manufacture from blanks rivets for insertion in the heel or toe or stay of the arctic or like overshoe; and my herein-described invention relates to the same class of rivet slotting or milling machines as were fully set out and described in my application "A" of even date herewith; and the present invention consists wholly in providing such a construction of the parts as will adapt the machine for manufacturing from the metal blanks the finished rivet for the above-stated purpose.

The invention also consists in the detail construction and arrangement of the parts, as hereinafter fully described, and pointed out in the claims.

In specifying my invention reference is had to the accompanying drawings, in which like letters indicate corresponding parts in all the figures.

Figure 1 is a top plan of my improved rivet slotting or milling machine, illustrating the general arrangement and construction of the parts. Fig. 2 is a side elevation of the machine, taken from the rear side back of the feeding-gage, illustrating the relative arrangement of the parts and the stripping device which removes the finished rivets from the blank-holding carrier and receives them in a tray which conducts the rivets to a receptacle. Fig. 3 is an end view, partly in section, illustrating more particularly the form of the feeding-gage and means for automatically regulating the feed of the rivet-blanks to the rotating blank-holder, and also the arrangement of the cutters for slotting the shanks of the rivets and the gears for transmitting motion to the cutters. Fig. 4 is a sectional view of the rotating blank holder or carrier and the slotted curvilinear guide, which, in connection with the blank-holder, forms a chuck to securely hold the shank of the rivet in the cutting operation. Fig. 5 is a side elevation of one-half of the machine, it being understood that in the example of my invention herein illustrated a double or duplex machine is illustrated, and the said view illustrates the front side or side looking toward the feed of the machine, the portion of the frame in proximity to the rotating blank-holder and the cutters being broken away for the purpose of illustrating the form of the cutters. Fig. 6 is an end view of the feeding-gage, illustrating the channels or ways therein for the metal blanks to slide down to the blank holder or carrier. Fig. 7 is a detached view of the feeding-gage, showing the means for automatically feeding the rivet-blanks successively to the blank holder or carrier, the said view showing an edge view of the feeding-gage. Fig. 8 is a top plan of the view shown in Fig. 7. Fig. 9 is a section taken on line *x x*, Fig. 5, from below, showing the actuating-worm and the shafts for actuating the cutters. Fig. 10 shows a detached edge view of the feeding-gage. Fig. 11 shows a transverse section of the same, clearly illustrating the shape of the channel in which the rivets slide to the blank-holder; and Fig. 12 is a front view of Fig. 10.

A represents the feeding-gage, which is constructed substantially similar to the feeding-gage illustrated and described in my application "A" of even date herewith, and is provided with ways *a a*, extending from its upper end to that portion of the gage A where the periphery of the blank-holder B becomes coincident to the top portion of the spring portion A′ of the feeding-gage, and the lower extremity of the feeding gage A terminates in the angular flange-piece A^2, resting on the frame M, where it is secured in any suitable manner.

The ways *a a* are of an inverted-T shape in cross-section to form a channel for the rivet-blanks to slide in upon their heads, the shank portion of the blanks being uppermost.

The feeding-gage A may have several rows

or series of the channels *a a*, according to whether the machine is single or multiplex in character, and according, also, to the width of the blank holder or carrier, which will now be explained.

B represents the blank-holder, which is circular in shape and mounted on a shaft, I², Fig. 3, which runs in the bearings I′, Figs. 1 and 2. The periphery of the blank holder or carrier is provided with rows of circular indentations *a′*, of sufficient size to receive the heads of the rivet-blanks S, and these indentations extend circumferentially around the blank-holder B. The number of rows or series correspond to the number of channels *a a* formed in the feeding-gage A, and the rows of circular indentations or recesses *a′* being arranged coincidental with the exits of the channels *a a* in the feeding-gage A, and the combined operation of the feeding-gage A and blank holder or carrier B is substantially the same as that of the like device in my aforesaid application "A," the difference consisting in the fact that in my present invention the blank-holder is made solid and provided with the circular depressions or recesses *a′ a′* to receive and hold the head of the rivet-blank and to carry the same to the cutters.

D, Fig. 3, is a curvilinear slotted guide, which conforms to the curve of the rotating blank holder or carrier, and is substantially coincident with the periphery thereof, as is best illustrated in the view, Fig. 3, and this guide is provided to securely hold the shank of the rivet-blank against lateral displacement during the cutting operation, and it conforms in all respects to the same device for the same purpose described in my aforesaid application "A," differing in the construction of the slot for the shank of the rivet-blank in the particular combination described, and the curvilinear guide D and the rotating blank-holder form together a two-part blank-holder for confining or chucking the shank of the blank against lateral displacement while the blank is being fed to the cutter, and the cut in the slotting operation is accurately defined by locating the cutting-tool relatively to the guide and blank-holder, so that the cut of the central or elongated saw, hereinafter described, comes directly in the middle of the shank of the rivet-blank while the side cutters form the chisel-points on the extremity of the clinching-prongs of the rivet.

The cutters C, Fig. 3, are located below the feeding-gage, as best shown in Fig. 3, on the front side of the machine, and consist of three metal-cutting saws mounted upon the same arbor side by side, the two outside saws being denoted by *c c*, and are of the same diameter, while the middle saw, *c′*, is of greater diameter and slightly different in contour of its cutting-edge, the side saws being beveled or chisel-pointed, while the middle saw, *c′*, is blunt-pointed and tapering gradually to its extremity. The object in employing three cutting-saws is to simultaneously in the same operation slot the blank S and point the clinching-prongs.

In order to make a clean-cut rivet and to remove the burr left by the cutters C, I provide a second set of cutters, C′, located back of the cutters C and rotating reversely to the direction of the travel of the cutters C. These reversely-rotating cutters consist of the bifurcated set exactly like the cutters C, except as to the direction of either, and they serve to finish the cut and remove the burr left by the first cutters, and their operation will be readily understood upon reference to the drawings. I do not, however, restrict my invention to the employment of two sets of cutters, as described above, rotating reversely in relation to each other, nor do I restrict my invention to the employment of cutters having three cutting devices, as previously described, since any suitable arrangement of cutters that will co-operate in connection with the blank holder or carrier B and the curvilinear guide to accomplish the desired result—*i. e.*, the slotting of the rivet—will answer the purpose, and the cutters may be arranged to rotate in the same direction to accomplish this purpose, and one set of the said cutters—to wit, the forward set—may consist of single cutters like the enlarged central cutter, *c′*, which simply mills out a straight slot in the rivet-blank, while the three metal-cutting saws *c c′ c*, located back of the first set or single cutters, serve to complete the operation and simultaneously point the rivets, as previously described.

F is the device for removing the finished rivets from the blank-holder after the slotting and cutting operation is completed without stopping the machine.

The device consists of a body portion, F, secured upon the arms or extensions *n n* of the uprights *m m* of the frame M, and is provided with the projecting piece F′, formed of spring metal, bearing against the periphery of the blank holder or carrier B.

Immediately below the stripper F′ is an opening in the part F for the rivets to fall through, and they drop into a tray or trough, T, Fig. 2, and thence into a receptacle provided to receive them.

It will be observed that the stripping device F′ is of sufficient length to extend across the periphery of the blank holder or carrier B and the opening below the device is sufficiently large to allow the finished rivets to freely drop into the trough or tray T.

In order to secure an automatic and consecutive feed for the machine, I provide in the ways or channels *a a* of the feeding-gage A pivoted levers E, pivoted at *e²*, Figs. 7 and 8. This device is substantially like (in construction) the device for the same purpose in my aforesaid application "A," with the exception that the ends *e³ e⁴* are simply angular points extending in the path of the shanks of the rivet-blanks instead of depending into the channel to collide with the heads of the screw-blanks, as described in the aforesaid application

"A," and this device is located on the feeding-gage in the same relation to the rotating blank holder or carrier as the like device in the said application "A."

E′ is a post secured on the feeding-gage A to support the spring *e*, and the opposite end of the said spring *e* is secured to the post E^2 of the pivoted lever E, and the device operates exactly as the like device described in my aforesaid application "A" to feed the blanks successively to the blank holder or carrier B, and I provide the spring portion A′ of the feed-gage A directly below the pivoted lever E to aid the blank in engaging the indentations in the rotating blank-holder, as in my aforesaid application "A."

The blank holder or carrier B is rotated on the arbor I^2, which is mounted in the bearings I′ I′, as previously stated, and the blank-holder is actuated by means of the worm gear wheel I and the worm J, as best shown in the sectional view, Fig. 9. The worm J passes transversely through the main frame M of the machine in a U-shaped bearing O, formed between the vertical extensions *m m* of the frame M, as best shown in Fig. 2, and the worm-shaft *h* is actuated by a belt on the driving-pulley H.

The cutters are actuated by belts on the pulleys G and the gears *g g g*, the cutters being sustained on the arbors g^2, Figs. 2 and 3.

I do not restrict myself to the detail construction of the actuating means whereby the operating device in manufacturing rivets is actuated, as such actuating means may be readily changed without departing from the principle of my invention.

The operation of my improved rivet-machine is as follows: The blanks are slipped in the ways or channels *a a* of the feeding-gage A head down, and slide to the gate formed by the pivoted lever E and its projecting extensions e^3 e^4, from which they drop by gravity into the circular indentations or recesses formed in the periphery of the rotating blank holder or carrier, in which they are forced past the gate or lever E and are carried by the blank-holder or chucking device, composed of the combined two-part blank-holder and curvilinear guide, where they are securely held and fed forward during the cutting operation to the reversely-rotating cutters, after which they collide with the stripper F′, which removes the finished rivets from the blank-holder B, from which they drop into the trough or tray T and into the receptacle provided to receive them. The speed of the machine depends upon the rapidity of the feed and the speed with which it is driven, which of course is dependent upon the character of the material of the blanks. The movement or direction of movement of the gears and intermediaries, as well as of the blank holder and cutters, is indicated by the arrows in Fig. 3, and the machine is compact, simple in construction, and very rapid in operation.

It will be observed that I have illustrated a double machine in the within-described example of my invention. Since two sets of feeding-gages and blank-holders can be actuated from the same pulley, H, it is only necessary to double the cutters and pulleys G to operate a duplex machine, hence it is economical to construct the machine as illustrated, although single machines will operate with great efficiency and rapidity.

By my invention rivets can be manufactured with great accuracy and uniformity and finished without additional operations to complete the same.

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

1. A rivet-slotting machine comprising a feeding-gage having ways for the rivet-blanks, a blank-holder having indentations or recesses in its periphery to hold the heads of the rivet-blanks, a curvilinear slotted guide underneath the blank-holder and coincident therewith to hold the stem of the rivet against lateral displacement while being operated on by the cutters, and cutters projecting into the slot of the guide, substantially as and for the purpose set forth.

2. The combination of the automatic successive feeding-gage with the rotating blank-holder having circular indentations in its periphery to receive the heads of the blanks, a curvilinear slotted guide to hold the stem of the rivet against lateral displacement during the cutting operation, cutters for milling out the shank of the rivets, and supplemental cutters for finishing and pointing the rivets simultaneously, substantially as and for the purpose set forth.

3. The combination of the rotating blank-holder having circular indentations to receive and carry the blanks, a slotted curvilinear guide to hold the rivet-shank against lateral displacement during the cutting operation, and a cutting device having three cutting-surfaces arranged side by side, the middle cutting-surface extending below the side cutting-surfaces, whereby a rivet is slotted and its clinching-points are cut to a chisel-shaped point simultaneously in the one operation, substantially as and for the purpose set forth.

4. The combination of the rotating blank-holder having circular indentations to receive and carry the blanks, a slotted curvilinear guide to hold the rivet-shank against lateral displacement during the cutting operation, and two sets of reversely-rotating cutters, each composed of three cutters arranged side by side upon an arbor, with the central cutter longer than the side cutters and shaped to slot the rivet while the side cutters shape the outer sides of the clinching-prongs to a chisel-point simultaneously and in the one operation, substantially as and for the purpose set forth.

5. The combination of the rotating blank holder or carrier B, having series of circular indentations or recesses *a′* in its periphery, and a curvilinear guide, D, located underneath the

blank-holder and coincident therewith and having a slot, *d*, for each row of indentations *a'* in the blank-holder B, and cutters C C', located centrally in the slot *d*, substantially as and for the purpose set forth.

6. The combination of the rotating blank-holder B with the trough T and the stripping device F', having an opening for the rivets to drop through into the trough T, substantially as and for the purpose set forth.

7. The cutters C, consisting of the saws *c c c'*, mounted on a common arbor, the side saws, *c c*, being shaped to cut a chisel-point on the clinching-prongs of the rivets S and the central saw shaped to bifurcate the rivet, substantially as and for the purpose set forth.

8. The combination of the main frame M, having vertical extensions *m m*, U-shaped bearing O for the worm J, and side extensions, *n n*, to support the stripping device F' and the trough T, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 18th day of December, 1886.

JACOB J. UNBEHEND.

Witnesses:
FREDERICK H. GIBBS,
E. C. CANNON.