H. OVERMAN.

RIVETING IMPLEMENT.

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905,570. Patented Dec. 1, 1908.

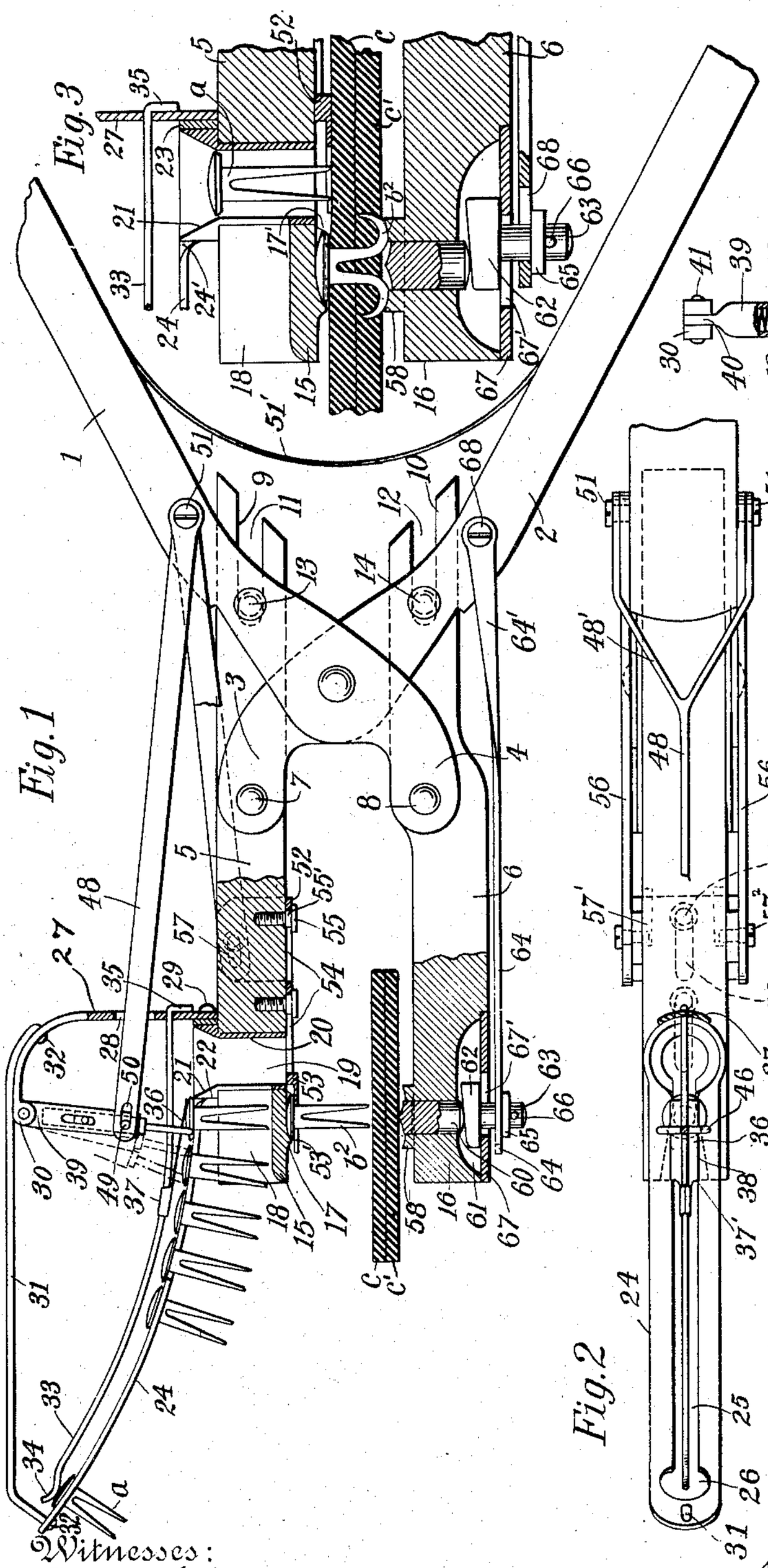

Fig. 1

Fig. 2

Fig. 3

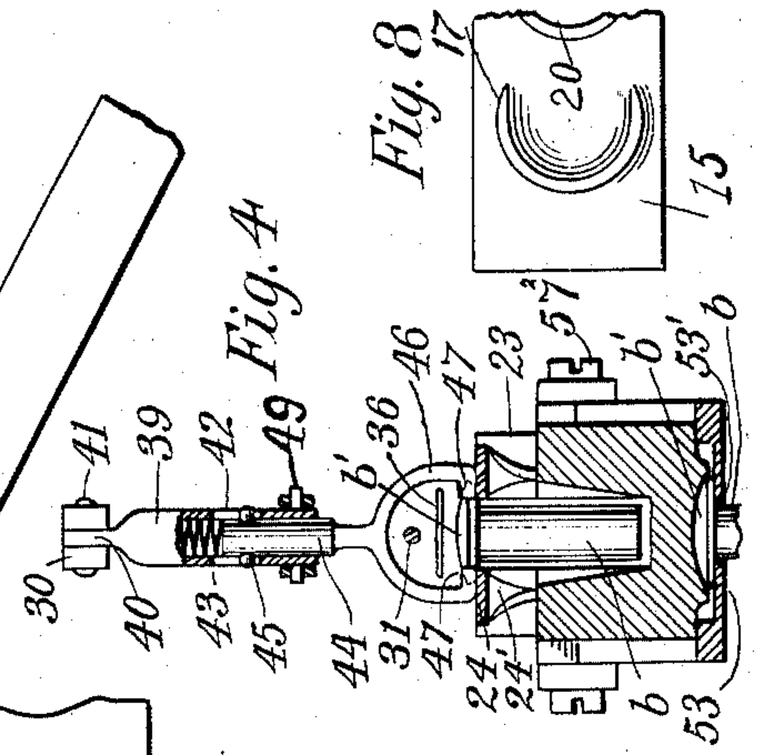

Fig. 4

Fig. 8

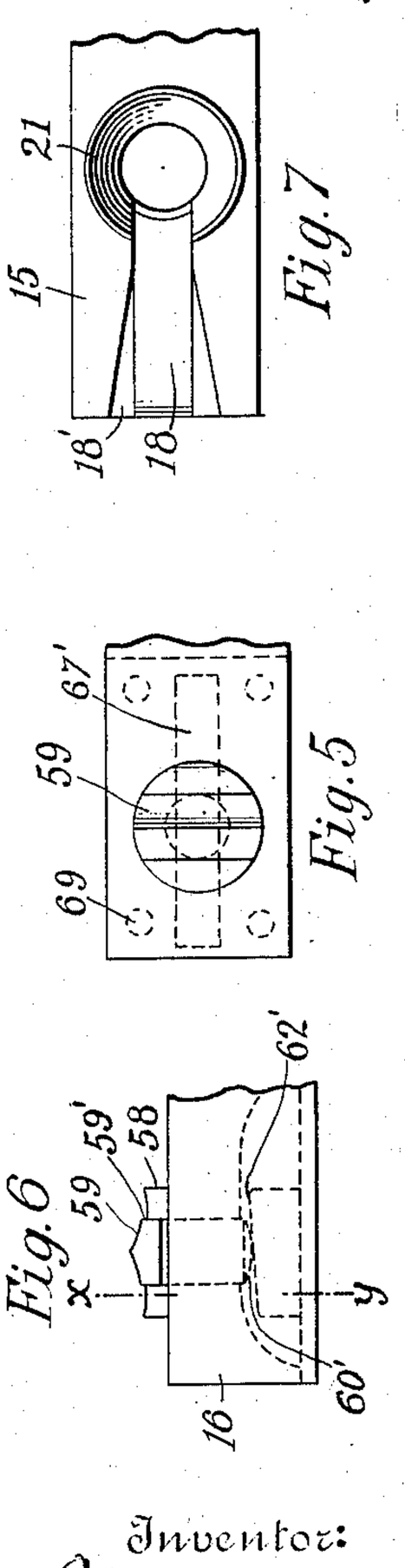

Fig. 7

Fig. 5

Fig. 6

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UNITED STATES PATENT OFFICE.

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RIVETING IMPLEMENT.

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To all whom it may concern:

Be it known that I, HENRY OVERMAN, a citizen of the United States, and residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Riveting Implements, of which the following is a specification.

My invention relates to improvements in riveting implements, and more particularly to that type which is adapted for successively forcing a rivet through flexible material, such as leather, rubber and the like, and clenching the protruding ends thereof, whereby a ready means of uniting the free ends of whatever materials may be selected, is afforded.

The object of my invention is to produce an efficient and comparatively simple implement, which is automatic in operation and is particularly effective for the purpose of exerting symmetrical pressure upon the head of a rivet while requiring a minimum of effort on the part of the operator.

Heretofore in repairing machinery-belting, harness, rubber belts and the like with so-called bifurcated or two-pronged rivets, various rivet-holders have been provided, and the rivets when manually inserted therein, were either forced through the material operated upon by means of pressure applied to the lever handles of suitable pliers, or by means of repeated blows from a hammer applied directly to the rivet-head while retained in the said holder. In the first instance, unless so-called parallel-jaw pliers, supplied with rivet holding means, were utilized for the purpose, the inner prong of the rivet was deflected to a much greater extent than the outer prong, or the prong adjacent the outer end of the jaws, and thus the symmetrical deflection of the prongs could not be accomplished. In the latter case not only was much time consumed both in forcing the rivet through the belting or other material, and also in clenching the same, owing to the necessity for repeatedly striking the rivet-head by means of the hammer, but the element of skill played an important part in the operation, and even the most skilful operator was unable to uniformly clench all of the rivets applied to a single belt.

Having thus described the nature and object of my invention, I will now proceed to describe the construction and operation of the implement embodying the features of my invention in their preferred form, reference being had to the accompanying drawings forming a part of this specification.

In the drawings Figure 1 is an elevation of an implement embodying the features of my invention, a portion of the same being shown in section. Fig. 2 is a plan view of the implement shown in Fig. 1, the handles and a portion of the rivet-feeding mechanism being broken away. Fig. 3 is a detail sectional elevation of the outer ends of the respective upper and lower jaws of the implement shown in Fig. 1. Fig. 4 is an elevation chiefly in section of the outer end of the upper jaw, and of a portion of rivet-feeding mechanism. Fig. 5 is a plan view of the upper face of the lower jaw showing a miniature anvil constructed thereon, and Fig. 6 is an elevation showing the same parts. Fig. 7 is a plan view of the outer end of the upper jaw with the rivet-feeding mechanism removed. Fig. 8 is a plan view of the same portion of said jaw looking in the opposite direction from that shown in Fig. 7, and showing the concave seat for receiving the rivet-head.

Referring to the drawings in detail, the handles 1 and 2 are secured by means of the extensions 3 and 4 to parallel-jaws 5 and 6 respectively by means of pivots 7 and 8. The alinement and parallel motion of said jaws is attained by means of the slots provided in the extensions 9 and 10 of said jaws, said slots 11 and 12 being adapted to receive pins 13 and 14 and thus, while permitting of longitudinal motion of said pins simultaneously with the movement of the handles 1 and 2, the perfect alinement and simultaneous movement of the jaws is secured and the same remain parallel to each other irrespective of the position of the handles 1 and 2. The outer ends 15 and 16 of the said jaws are provided with rivet-feeding and clenching mechanisms which are adapted to coact with the said handles, as hereinafter described.

The lower face of the end 15 is provided with a discontinuous curvilinear rib 17, which as shown in Fig. 8 is broken away sufficiently to receive a rivet-head and to snugly embrace the same when positioned therein. The end 15 is provided with a groove 18 which is sufficiently deep to permit of the reception of the legs or prongs of a bifurcated rivet depending from the feeding mechanism hereinafter described, and said groove is beveled on opposite sides, from the outer end thereof to a point adjacent the inner end of said groove, as designated by

the numeral 18′. The object of beveling the sides of said groove is to cause the rivet to assume the position shown in Fig. 3 as it enters the opening 19, which opening extends completely through the outer end 15 of the jaw 5. It is evident that if the groove 18 at its inner end is approximately the width of the shank of the rivet when in the position shown in Fig. 4, and also Fig. 3, and provided the width of the rivet is greater across the same in the opposite direction, from that shown in said figures at the point approximating the lower ends thereof, that, even if the rivet enters the groove 18 in such a position that it extends across and contacts with the beveled portion 18′, then the said bevel will gradually revolve it and cause the rivet to present its narrowest dimension to the inner end of the groove 18 and enter the opening 19 in the position shown in Figs. 3 and 4.

In the opening 19 is inserted a hollow plug 20, provided with a slot 21 corresponding in size to the inner end of the groove 18. The upper end of said hollow plug is flared on its inner face and provided with a square outer face 22. A band 23 which is integral with an arm 24 is secured to the outer face of said hollow plug, said band 23 being an inverted extension in a vertical plane of the arm 24, obtained by twisting the arm 24 as shown at 24′. Said arm 24 forms approximately a 30° angle with the axis of the jaw 5 and thus permits of rivets being fed by gravity from the upper or outermost end of said arm to the inner end thereof. A slot 25 extends longitudinally throughout the greater portion of said arm 24 and corresponds in width to the upper end of the rivet shank, being sufficiently small to prevent the passage of the rivet head therethrough when a rivet is inserted within said slot. The outer end of said slot is enlarged sufficiently to permit of the passage of the rivet-head therethrough and thus a rivet can be introduced upwardly through said enlarged opening and into the slot 25.

A sheet spring metal supporting member 27 provided with an elongated slot 28 is connected to the outer face of the hollow plug 20 by means of a screw or brad 29, which screw or brad also serves to secure the ring 23. I provide at one end of the supporting member an eye 30 and an extension 31, said extension being secured both to the supporting member 27 and to the arm 24, preferably by spinning over the ends as designated by the numeral 32.

A spring finger 33, which is depressed at 34, sufficiently to cause the same to bear upon a rivet immediately the same is projected through the opening 26, prevents accidental displacement of a rivet, once the same has been inserted through the opening 26 and into the slot 25. It is readily seen that since this spring finger is merely depressed at the upper end and is a distance from and parallel with the arm 24 throughout the remainder of its length, that the rivets may freely move along said slot while being prevented from dropping out of the same even if the instrument is inverted, and this applies also when a rivet has entered the hollow plug 20, since the spring finger spans the upper end of said hollow plug also. The spring finger is secured to the supporting member 27 in any suitable manner, preferably by turning over the end as shown at 35.

An incline sheet metal spring 36 is secured by means of a sleeve to the spring member 33, and is provided with niches 37 adapted for the purpose hereinafter described. Said spring 36 normally rests upon the upper face of the arm 24 and is rigidly held in such position by the sleeve 37. Its elasticity, however, offers but little resistance to the passage of a rivet-head thereunder in the manner hereinafter described.

A tubular member 39, forming part of the rivet-feeding mechanism is suspended from the eye 30 by means of a pin 41 which penetrates the reduced upper end 40 of said tubular member. A slot 42 is provided in the opposite sides of said tubular member and a spring 43 is confined within said member 39 intermediate the upper end thereof, and a piston arm 44 of a forked member 46. A pin 45 penetrates said piston arm and limits the outward movement of the same to correspond with the length of the slot 42 in which it freely travels. The forked member 46 is adapted to span and embrace both the spring finger 33 and spring 36 and is provided with offset ears 47 which are adapted to engage a rivet-head *b′* (see Fig. 4), owing to the fact that the distance between the opposing ears is slightly less than the diameter of the rivet head as shown, and also less than the width of the spring 36.

A link or rod 48 provided with a slot 50 in both of the members of its forked outer end, as shown in Fig. 4, is adapted to connect said tubular member, through the agency of the pin 49, which is received by said slot, with the handle 1, by means of a screw bolt 51 which connects the inner forked end of said link or rod with said handle. It is evident that when pressure is applied to said handles 1 and 2 that said tubular member will be retracted from its outermost position (see dotted lines Fig. 1), and will shove a rivet *a* from the position shown in Fig. 1 to the position shown in Fig. 3, namely, it will introduce the rivet within the hollow plug 20. When on the other hand, the pressure is relieved from said handles, the jaws of the implement will be opened by the action of the spring 51′. Simultaneously the offset ends of the forked-pusher 46, which as shown in Figs. 1 and 4, during the forward

movement of the fork and prior to its escape from beneath the inner and lowermost free end of the rivet-retaining leaf-spring 36, normally rests on the arm 24, will ride up the incline surface of the leaf-spring. Said leaf-spring throughout the greater portion of its length is of sufficiently greater width than the distance between the said offset ends of the pusher, to prevent the projection or escape of said ends beneath the incline surface until the said forked-pusher has attained a position immediately above the reduced neck 37′ of said leaf-spring. The latter as shown (Fig. 2) is of insufficient width to permit of the engagement with said offset end 47 (Fig. 4) and thereupon the said fork, which is nominally impelled downwardly by the action of the coil-spring 43, will project below said leaf-spring 36, the same in effect being a straddle of the neck of the leaf-spring and assumes the position shown in the outermost dotted lines of Fig. 1 *i. e.* immediately behind a rivet-head. From this construction it is evident that not only will a rivet be positively fed forward into the hollow plug 20 upon compressing the jaws 1 and 2, but also other rivets which assume the position of any rivet removed by said forked member will be prevented from accidentally dropping into said hollow plug. Moreover, owing to the fact that the distance between the opposing ears 47 of the forked member is less than the width of the spring 36, it is evident that while said ears are not prevented from being positively thrust beneath said spring when feeding a rivet, yet they will be prevented from returning in the same path and will be caused to rise up along the spring 36 and above any rivet which has replaced the rivet removed by said forked member, and thus the compound, forward-upward and-downward motion is obtained.

The slot 50 permits of lost motion and its length will depend upon the amount of lost motion which may be desired when handles 1 and 2 are compressed, as it is evident that the rod or link 48 will not act upon said member 39 until the pin 49 engages the outer end of the slot, and therefore the lost motion will correspond to the length of the slot, or in other words, the distance which the pin 49 is permitted to freely travel without contact with the outer end thereof.

A rivet-holding member 52 is provided with an off-set portion 53, which is adapted to receive a rivet-head while permitting the shank of said rivet to project through the notch 53′ which is provided in the end thereof, as shown in Fig. 4.

Two slots 54 sufficiently elongated to produce the effect hereinafter described are adapted to receive screws 55 provided with shoulders 55′, said shoulders corresponding in width to the width of the slot, and being smaller than the head of the screws 55, whereby the rivet-holding member is securely connected to the upper jaw 5.

Opposing links 56 provided with slots 57 are secured by means of screws 57^2 to upwardly extending portions of said rivet-holding member, as shown, and preferably as illustrated in Fig. 2, an elongated slot is provided in the upper jaw, and at opposite sides thereof, to correspond with the distance through which said slide moves, namely, a slot equal in length to the slots 54. Thus the said rivet-holding member can be more effectively secured to the upper jaw, owing to the fact that in lieu of a screw merely connecting the upwardly extending portions of said rivet-holding member with the links 56 a small portion of said screw may project into the slots 57′ without impeding the relative movement of the rivet-holding member with respect to said jaw 5.

It is evident that the slots 57 will permit of lost motion in a manner similar to that described in connection with the slots 50, and therefore when said jaws 1 and 2 are compressed, the rivet-holding member 52 will remain momentarily stationary, the time depending upon the distance between the outer end of the slot 57 and the pin or screw 57^2 which when the jaws are in their open position will be at the inner end of the said slot. As the jaws approach one another the links 56 will gradually recede and initially, without causing a corresponding recession of the rivet-holding member, which member will remain in the position shown in Fig. 1 until the rivet-prongs b^2 have entered the material comprising two layers *c* and *c′* a sufficient distance to independently support the rivet. Immediately the rivet has entered sufficiently into said material operated upon to eliminate the necessity of supporting the same by means of a holder, the links 56 will begin to withdraw the said holder and the inward movement will only be limited by the screws 55 contacting with the outer ends of the slots 54. In such position as shown in Fig. 3 the forked end of the holder will project immediately across the lower end of the opening 19 through which a rivet *a* drops upon opening the jaws 5 and 6, being thereby received by the said forked end. Upon applying pressure to the jaws, subsequent to the retraction of the rivet-holding member, the rivet-head is caused to flushly engage the material operated upon, as shown in Fig. 3.

As soon as pressure is relieved from the jaws 1 and 2, the spring 51′ causes the jaws to separate and effects the outward motion of the links 48 and 56 and the outward motion of the latter serves to thrust the rivet-holding member 52 forward as soon as the desired amount of lost motion is secured. It is necessary that the forward movement

of the rivet-holding member 52 be prevented until the jaws are sufficiently distant to permit the rivet shown in Fig. 3 to drop through the opening 19 completely so as to permit the same to be shoved by the forked end 53′ without obstruction into the concave seat 17. The forked end 53 is sufficiently resilient to normally cause the same to bear against the rivet-head when said rivet-head is contained within the seat 17 and thus prevent its accidental escape therefrom.

The hollow plug 20 can be readily removed from the opening 19 by merely removing the screw or brad 29 and a larger or smaller plug may be substituted therefor, provided the external diameter of the new plug is adapted to frictionally engage the walls of said opening. Thus a plug of a smaller internal diameter adapted for smaller rivets may be substituted if desired.

On the lower jaw 6 I provide a miniature anvil 58, which is composed of a retractable center and permanently fixed, oppositely disposed members 58. A cylindrical neck or shank 60 projects within a recess adapted to receive the same and extends vertically through the upper face of the jaw 6, and the lower conical end 60′ projects into a second recess 61 extending longitudinally and horizontally within said jaw and adapted to confine therein a wedge member 62 mounted on a rod 63. A link 64 connects with said rod 63 and with the handle 2, being connected by a pin 66 and an intermediate washer 65, and also a screw or pin 68 respectively.

The bottom of the recess 61 is covered by a slotted cap 67, the slot 67′ being elongated. An elongated slot 68 also permits of lost motion in a manner corresponding to the purpose of slots 50 and 57. The link or rod 64 is provided with a slot 68, above noted, and upon pressure being applied to the handles 1 and 2, the rod or link 64 affects the retracting of the wedge member 62 through the agency of the post 63, which is capable of limited motion in the said slot 67′. Upon the retraction of said wedge member, the member 59 recedes within the jaw 6 as shown in Fig. 3 and the ridge upon said member 59 is thus prevented from contacting with the lower face of the material in which the rivet is to be clenched, while the members 58 being fixed upon said jaw exert the proper degree of pressure desired wholly upon the prongs of the bifurcated rivet and thus with a minimum of effort the prongs are clenched in said material, as illustrated in Fig. 3.

In Fig. 6 the line x—y designates a perpendicular dropped from the center of the circle of which the arcs comprising the upper surface of the members 59 and 58 are a part. It is evident therefore that the curvature of the upper surface of the member 58 is not only continuous but extends beyond the perpendicular x—y for the reasons hereinafter specified.

As shown in Fig. 6, the member 59 is adapted to project slightly above the upper surface of the member 58, as shown at 59′, and thus the ends of the respective prongs of the rivet readily slide from the surface of the member 59 onto the upper surface of the member 58, whereas otherwise the member 59, if positioned below the member 58, would be unable to perform its function.

As shown in Fig. 3, the prongs of the rivet having been spread or separated by the member 59, the upper surfaces of which, on opposite sides of the central ridge thereof corresponds to the curvature of the opposing members 58, are caused to project substantially vertically upward and into the material operated upon, owing to the fact that the curvature of the surface of the members 58 continues uninterrupted slightly beyond the perpendicular dropped from the center of the circle from which the said arc is described. In the absence of sufficient curvature to initiate the upward as well as the outward movement of the ends of the rivet prongs, the same are merely flattened against the material treated without substantial penetration. The penetration is of the utmost importance when it is desired to effect a proper juncture by means of rivets of a metal plate and a flexible band, said metal plate having suitable openings for the reception of the rivet shank, or, on the other hand, the overlapping ends of two flexible bands.

The lost motion effect heretofore referred to is for the purpose of accomplishing the simultaneous movement of the links or rods 64, 48 and 56 at the desired periods, as it is evident that were the rods or links 56 to thrust the rivet-holding member forward, prior to the passage of a rivet a completely through the opening 19, that said rivet would be jammed against the outer wall of said opening and the forward movement of the rivet would be prevented. It is therefore necessary to provide slots 57 in said rods of sufficient length to permit of lost motion until the moment when the positive forward movement of the rivet holding member is desired according to the required period which it is found necessary to provide for. Likewise it is evident that the rearward movement of the wedge 62 must not occur simultaneously with the initial movement of the jaws upon the compression of the handles 1 and 2, as the anvil member 59 is required to remain stationary until the prongs of the bifurcated rivet have passed completely through the material or materials operated upon and have been partially deflected along the surfaces of said anvil-member and in the direction corresponding to the curvature of the said surfaces and necessarily to the

curvature of the similar surfaces of the members 58. In order to accomplish this desired amount of lost motion the slot 68 is elongated sufficiently to prevent the forward or rearward motion of the wedge 62 until the moment when it is desired that said movement should occur. The slot 50 in the rod 48 also permits of a desired amount of lost motion and enables the operator to accomplish the positive feeding of the rivet into the hollow plug 20 at the desired moment, and likewise to adjust or regulate the forward movement of the member 39 subsequent to the insertion of the rivet into the hollow plug 20 as shown in Fig. 3.

The type of anvil herein described consists of a central retractable member having a transverse ridge centrally disposed thereon, but it is evident that without departing from the spirit of my invention, the central retractable member may be of any desired configuration. Moreover, such an anvil is adapted for other implements than parallel jaw-pliers and without departing from the spirit of my invention as covered by the claims all of the various combinations which are novel in this implement, and which are claimed as sub-combinations, may be adapted to other forms of implements.

The magazine comprising the arm 24, the spring-finger 33 and the spring 36, as shown, projects at an angle preferably to the axis of the upper jaw for the purpose of permitting of gravity feed of the rivets into the position which permits of their being engaged by the forked-member 46 when in its outward position as shown in the dotted lines of Fig. 1. Such a disposition of the magazine with respect to the position of the upper jaw eliminates the necessity of tilting or shaking the implement when repairing machinery-belting or the like, and enables the operator to manipulate the instrument in a substantially horizontal position.

Various minor changes in the details of construction from that herein shown may be made without departing from the invention as herein claimed.

In Fig. 5 retaining bolts or screws 69 are illustrated for the purpose of securing the cap or plate 67 to the bottom of the jaw 6, the plate being preferably countersunk in said jaw as shown in Figs. 1 and 3.

Having thus described my invention, what I claim is:

1. In a riveting implement, the combination comprising a pair of oppositely disposed pivoted jaws, a movable rivet-holder arranged to support a rivet intermediate the said jaws when the same are in an open position, means for retracting said rivet-holding means longitudinally of said jaws during the closing movement of the latter, an anvil on the inner face of one of said jaws adapted to directly oppose the lower end of a rivet when in an operative position in said rivet-holder, said anvil having an elongated central ridge and the portions of said anvil on opposite sides of said ridge having surfaces of a curvilinear configuration, said anvil presenting a surface to each leg of a forked rivet of substantially continuous and equal curvature beyond the perpendiculars dropped from the centers of the circles to which the said curvilinear surfaces correspond in curvature.

2. In a riveting implement, the combination comprising a pair of pivoted jaws, one of said jaws being provided with a rivet-magazine and also a passage extending vertically through said jaw adjacent the inner end of said rivet-magazine, a movable rivet-holder positioned on the lower face of said jaw and capable of being positioned directly beneath one end of said passage, a concave seat on the lower face of the aforesaid jaw adapted to receive the head of a rivet while retained in said rivet-holding means, means for retracting said rivet-holding means simultaneously with the downward movement of the said jaw provided with the rivet-magazine, an anvil directly opposed to said concave seat and positioned on the opposing jaw, and means for retracting the central portion of said anvil subsequent to the contact of the lower ends of a forked rivet therewith.

3. In a riveting implement, the combination comprising a pair of pivoted jaws, one of said jaws being provided with a rivet-magazine and also a passage extending vertically through said jaw adjacent the inner end of said rivet-magazine, said passage being of sufficient size to admit of the reception of a rivet from said rivet-magazine, means adapted to receive a rivet immediately subsequent to its exit from said passage and to feed the same forward into an operative position, an anvil on one of said jaws adapted to directly oppose the lower ends of a forked rivet when in an operative position, and means for causing the retraction of the highest portion of said anvil subsequent to its contact with the ends of a forked rivet.

4. In a riveting implement, the combination comprising a pair of pivoted handles, jaws connected therewith, means for maintaining said jaws in parallelism with respect to each other throughout the movement of the same, an anvil having an elevated central ridge positioned on the inner face of one of said jaws, said anvil being provided with arc-like surfaces extending in opposite directions from either side of said ridge, said arc-like surfaces being of equal curvature with each other, the surfaces of the outer portions of the said anvil being of substantially equal curvature to the curvature of the surfaces of those portions of said anvil adjacent said central ridge, the said outermost points of said curvilinear surfaces being beyond the points of intersection of the perpendiculars

dropped from the centers of the circles to which the said curvilinear surfaces correspond in curvature.

5. In a riveting implement, the combination comprising a pair of pivoted handles, jaws connected therewith, a removable hollow plug adapted to be secured within a passage provided in one of said jaws, a rivet-magazine secured thereto, an auxiliary support adapted to connect said plug with the outer end of said rivet magazine, a tubular-member suspended from said auxiliary supporting means, means adapted to engage a rivet-head projecting from said tubular-member and elastically supported therein, means adapted to prevent the accidental escape of a rivet from said magazine when the same is in an inverted position, a pusher-element adapted to normally contact with the upper surface of said rivet-magazine and capable of positively ejecting a single rivet from said magazine, and means for elevating said pusher-element out of contact with the upper surface of the rivet-magazine during the return movement of the said pusher-element, whereby a unidirectional feed of a rivet can be accomplished while permitting of the bi-directional longitudinal movement of the said pusher-element.

6. An anvil having a retractable central portion and oppositely disposed lateral portions, said central and said lateral portions being adapted to form continuous arc-like surfaces on opposite sides of the center of said anvil when the central portion is elevated to the required degree, each of said arc-like surfaces on opposite sides of the center, extending beyond the points of intersection of the perpendiculars dropped from the centers of circles included in said arc-like surfaces and of which each of said arcs is a part.

7. The combination, comprising a pair of pivoted handles, jaws connected therewith, a rivet-magazine connected to one of said jaws, a rivet-holding mechanism adapted to support a rivet intermediate said jaws, and connections embodying lost motion operatively connecting said rivet-holding mechanism with one of said handles whereby when said handles are operated the said rivet-holding mechanism will be permitted to remain stationary during a portion of the stroke of said handles.

8. The combination, comprising a pair of pivoted handles, jaws connected therewith, a rivet-magazine connected to one of said jaws, rivet-feeding mechanism adapted to effect the uni-directional feed of rivets contained in said magazine, and connections embodying lost motion connecting said rivet-feeding mechanism with said handles, whereby when said handles are operated the said rivet-feeding mechanism will be permitted to remain stationary during a portion of the stroke of said handles.

9. The combination comprising a pair of pivoted jaws, a retractable anvil positioned on the inner face of one of said jaws, handles respectively connected with each of said jaws, and connections embodying lost motion connecting said handles with the retractable element of said anvil, whereby when said handles are contracted the said retractable element of said anvil will initially remain stationary.

10. The combination, comprising a pair of pivoted handles, jaws connected therewith, one of said jaws being provided with a groove, said groove at one end being provided with beveled walls, the bevel on said walls constantly diminishing and entirely disappearing intermediate the ends of said groove, and the bottom of said groove being of substantially constant width throughout the length of said groove, whereby said groove is adapted to effect the revolution of an article of greater dimensions than the narrowest end of said groove when introduced therein and impelled longitudinally thereof and to cause the said article to present its narrowest dimensions to the smaller end of said groove.

11. The combination, comprising a removable hollow plug adapted to frictionally engage a passage provided in a jaw of a riveting implement, a rivet-magazine secured to said plug, an auxiliary support adapted to connect said plug with the outer end of said rivet-magazine, a tubular-member suspended from said auxiliary supporting means, means adapted to engage a rivet-head projecting from said tubular-member and elastically supported therein, means adapted to prevent the accidental escape of a rivet from said magazine and means capable of causing positive uni-directional feeding of a rivet from said magazine into said hollow plug.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this third day of December, 1907.

HENRY OVERMAN.

Witnesses:
W. H. SWENARTON,
CHARLES E. WIRZ.