C. J. WALKER.

GAUNTREE RIVETER.

APPLICATION FILED JULY 10, 1915.

1,158,874. Patented Nov. 2, 1915.

3 SHEETS—SHEET 1.

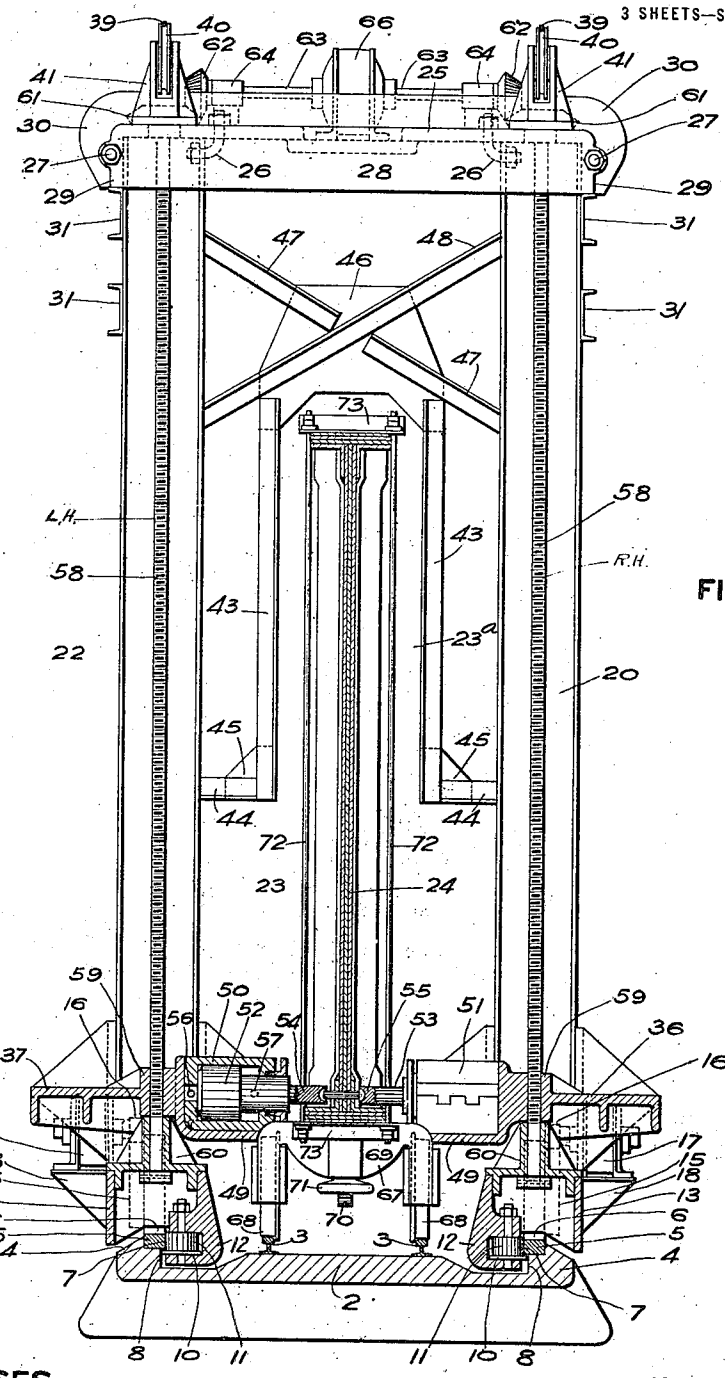


FIG. 1

WITNESSES

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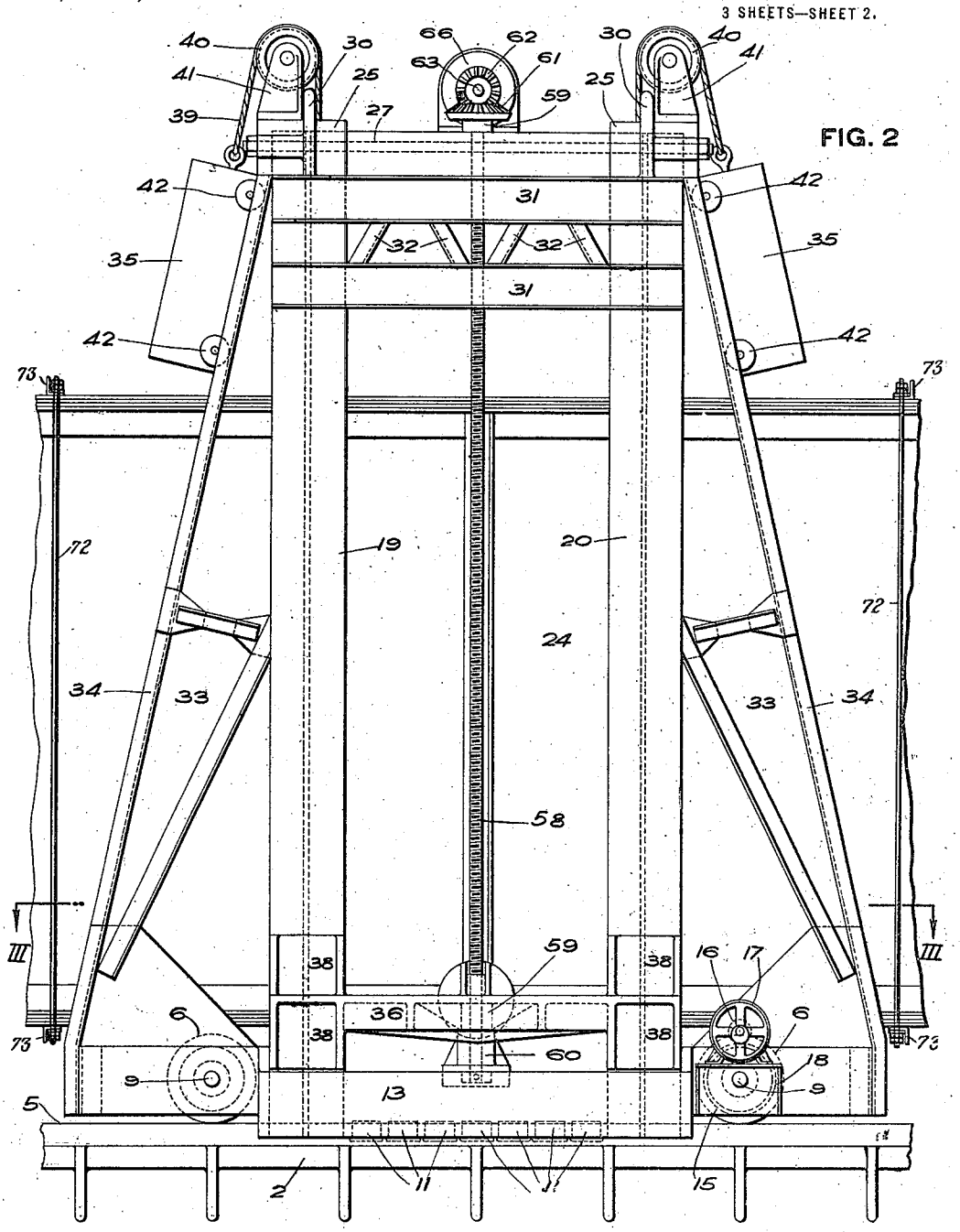
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3 SHEETS—SHEET 2.

FIG. 2



WITNESSES

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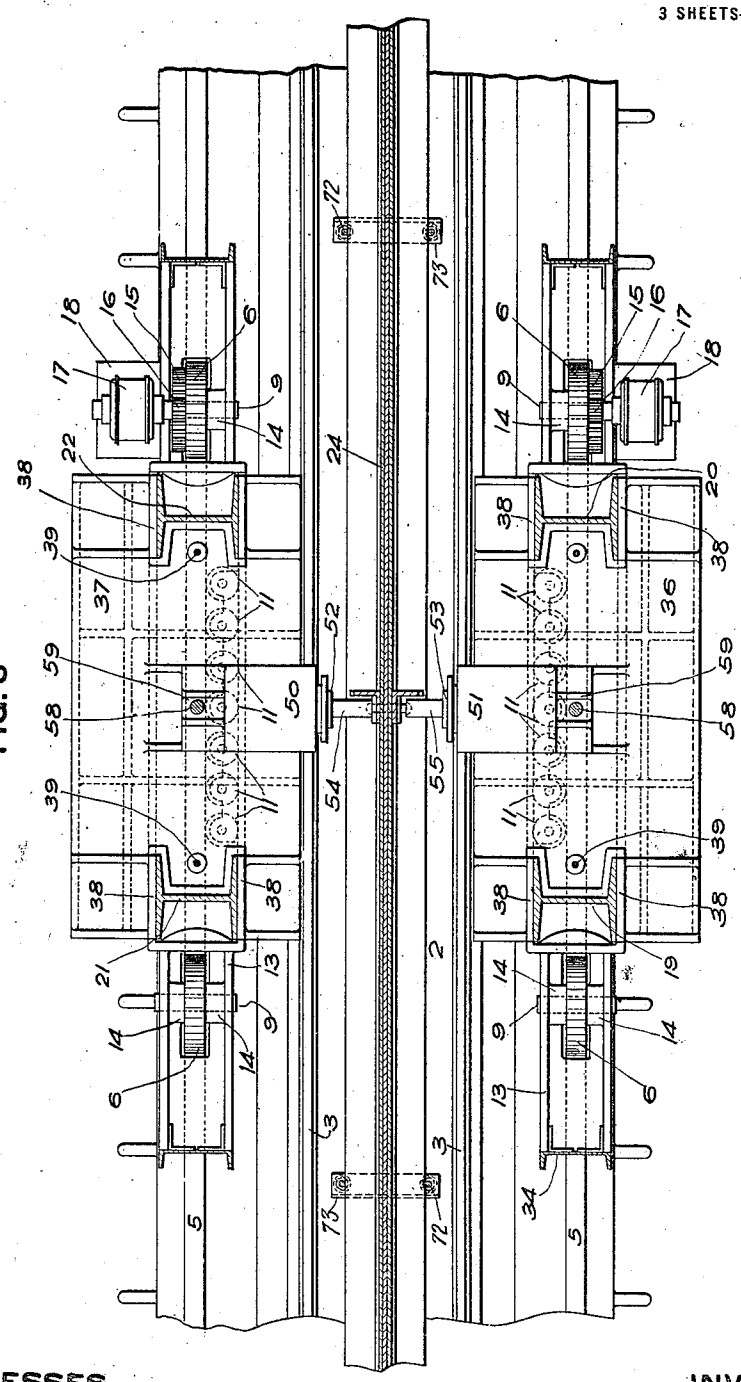


FIG. 3

WITNESSES

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GAUNTREE-RIVETER.

1,158,874. Specification of Letters Patent. Patented Nov. 2, 1915.

Application filed July 10, 1915. Serial No. 39,128.

To all whom it may concern:

Be it known that I, CHARLES J. WALKER, a citizen of the United States, residing at Gary, in the County of Lake and State of Indiana, have invented certain new and useful Improvements in Gauntree-Riveters, of which the following is a specification.

My invention relates to the construction of power riveters used in upsetting one end of the rivets to form a head thereon, in fabricating plate girders and similar built-up members of bridges, buildings, and like structures made of rolled metal plates, beams, angles, and other structural metal shapes.

Power riveters as constructed heretofore have always had opposite jaws forming an open throat therebetween with the power operated rivet snaps secured in the throat adjacent to the open outer ends of the jaws. Not being fastened or otherwise connected, the outer ends of the jaws are free to spring and spread outward so that the depth of the throat has been limited to much less than the depth of many girders now built in large numbers.

As a result it is frequently necessary in riveting such girders to drive the rivets first from one edge and then from the opposite edge of the girder toward the middle of its depth, which requires turning the girder, a slow and expensive operation. The limitations as to the depth of the throat of such riveters also makes it necessary to drive the rivets adjacent to the longitudinal center of the girders by hand. The large sizes of such open jaw power riveters are permanently secured to a suitable foundation which requires the girder or other member being riveted to be moved relative to the riveter in positioning the girder with respect to the riveter, and in bringing the hole or line of holes for the rivets into alinement with the rivet snaps into position for the successive rivets to be driven.

One object of my invention is to provide a gauntree riveter of improved construction having novel means whereby the riveter and rivet snaps on the riveter are moved into and maintained in the successive rivet driving positions.

Another object of the invention is to provide a riveter of novel construction having improved means whereby the riveting jaws are closed and are prevented from spreading in the rivet upsetting operations and whereby the depth of the throat of the riveter may be increased to any desired extent so as to form a riveter which will drive the rivets in the largest size girders made or likely to be made without necessitating turning of the girder during the riveting operations.

Another object of the invention is to provide a riveter of improved construction having novel means whereby the rivet snaps are moved on the jaws of the riveter into rivet upsetting or driving position.

A further object of my invention is to provide a gauntree riveter having improved means whereby tipping or upsetting of the girder or other work in the riveting operations is prevented and overcome.

A further object of my invention is to provide a gauntree riveter of novel construction having improved means whereby the girder or work is adjusted and held in position with respect to the riveter.

A still further object of the invention is to provide a riveter having improved means whereby the riveter is moved relative to the work being riveted in the successive rivet driving operations.

Still further objects of my invention consist in the provision of a riveter having the novel construction and arrangement of parts to be more fully described hereinafter and pointed out in the appended claims.

Referring now to the drawings forming part of this specification, Figure 1 is an end elevation, partly in section, showing a gauntree riveter constructed and arranged in accordance with my invention. Fig. 2 is a longitudinal side elevation of the riveter of Fig. 1. Fig. 3 is a sectional plan of the apparatus shown in Figs. 1 and 2, the section being taken on the line III—III of Fig. 2.

In the accompanying drawings, the numeral 2 designates a base plate of considerable length which is fixed on a permanent foundation and is provided with a track formed by rails 3, 3, which extend lengthwise on the upper surface thereof.

At each side of the base are upwardly extending flanges or ribs 4, and fastened on the top of these ribs are bars 5, 5, of rectangular cross section, forming a track for the wheels 6 of the riveter, which is arranged to move along the length of the base plate 2. The vertical inner faces 7 of the flat bars 5, 5, project inwardly beyond the vertical inner faces 8 of the ribs or

flanges 4 so the flanges 10 on the series of guide wheels 11, which are rotatably mounted in bracket bearings 12 on each truck frame 13 of the riveter, will prevent vertical lifting of the wheels 11 on the rails 5, 5.

The guide wheels 11 by engagement with the vertical faces of the rails or bars 5, 5, effectively prevent spreading or deflection of the lower unconnected ends of the jaw members of the riveter.

The track wheels 6 are secured on shafts 9 which are mounted in bearings 14 formed in the truck frames 13, and as shown the shaft 9 for one wheel 6 on each side of the riveter is connected by the spur gear 15 and a driving pinion 16 to the armature shaft of an electric driving motor 17. The motors 17, of which there is one on each side of the riveter, are supported on the shelf or platform 18 formed on the side of the truck frame 13.

Secured by one end to the truck frames 13 at the sides of the riveter are columns 19, 20, 21 and 22 which are arranged in pairs to form opposite jaws with a throat 23 therebetween in which the girder or other work 24 is positioned during the riveting operations. The jaws are conveniently formed of rolled beams of H-sections, as shown, but may be built up members or castings when found necessary or desirable.

Secured on the top or upper ends of the columns or jaw members is a sectional cap plate 25 which is fastened to the columns by bolts 26 and tie rods 27, this cap plate having marginal flanges 28 and 29 and stiffening ribs 30.

The upper ends of the jaws 19, 20, on one truck frame 13 are connected by channel struts 31, 31, and diagonal braces 32 and the jaws 21 and 22 are connected by similar bracing in the same manner.

The upper end of each jaw member 19 and 20, 21 and 22, is connected to the outer end of the truck frames 13 by the knee or bracing 33, the channel 34 forming part of this bracing forming a slide or track for the counterweights 35 for the vertically movable cross arms 36 and 37 on which the rivet snaps are mounted.

The cross arms 36 and 37 extend horizontally between the jaw members 19, 20, on one side of the riveter, and jaw members 21, 22, on the other side, and have ribs or flanges on the ends thereof forming slides 38, 38, embracing the flanges of the H-beams forming the jaw members 19, 20, and 21, 22.

Cables 39, or similar flexible connections, which pass over the wheels or pulleys 40 in the stands 41 on top of the cap plate 25 are employed to connect the cross arms 36 and 37 with the counterweights 35, and the counterweights are provided with wheels 42 which run in the track formed between the flanges of the channels 34 forming part of the knee bracing 33 at the sides of the jaw members 19, 20, 21 and 22.

The throat 23 formed between the jaws formed by the members 19, 20, and 21, 22, has a contracted upper end, angles 43 arranged in pairs back to back defining the horizontal width of the narrow portion 23^a of the throat. The lower ends of the angles 43 are connected to the jaw members 19, 20, 21 and 22, by angles 44 and plates 45, and the upper ends of the angles 43 are connected to a plate 46 which is connected to the jaw members by diagonal angles 47 and 48 (see Fig. 1).

Mounted in a pocket 49 in the upper face of the cross arms 36 and 37 are double acting fluid pressure cylinders 50 and 51 having pistons or plungers 52 and 53 arranged to reciprocate horizontally. The outer ends of the pistons or plungers are provided with rivet snaps 54, 55, which are removably and adjustably secured to the plungers and which are in axial alinement in a vertical plane. The cylinders 50, 51, provide power means for reciprocating the plungers 52, 53, and causing a relative approach of the rivet snaps 54, 55, in the rivet upsetting operations.

The ends of the cylinders 50 and 51 are provided with ports 56 and 57 by which the cylinders are connected in any desired manner to a source of fluid pressure, suitable valves being employed in the pipes connecting the ports and a source of fluid pressure to enable the fluid pressure to be shut off and turned on when desired.

The counterweighted cross arms 36 and 37 are connected to lifting screws 58, of which there is one for each cross arm. The upper ends of these adjusting screws, which extend lengthwise vertically and are mounted in bearings 59 in the cap plate 25, and bearings 60 in the truck frames 13, are provided with bevel gears 61 which mesh with the bevel pinions 62 on one end of shafts 63, 63. The shafts extend through bearings 64 positioned on the cap plate 25 and are connected to the ends of the armature shaft of an electric driving motor 66 which is mounted on top of the cap plate 25. In this way, when the motor 66 is operated the arm lifting screws 58 are rotated, the screws raising and lowering the cross arms 36 and 37 and the rivet snaps 53 and 54 supported thereon and maintaining the rivet snaps in horizontal alinement.

Mounted on the track formed on the base plate 2 by the rails 3, 3, is a plurality of trucks 67 which as shown include a body mounted on the flanged truck wheels 68. The number of trucks used will vary, depending upon the length of the work being riveted, and each truck is provided with a vertically adjustable support 69 on which the work 24 rests when positioned within

the throat 23 of the riveter. The support 69 is connected by a downwardly extending screw threaded shaft 70 to an adjusting wheel 71 rotatably mounted in the body of the truck 67 so that the support 69 can be raised and lowered vertically while positioning and leveling a girder or other work 24 supported thereon within the throat 23 of the riveter. Tie bolts 72 and clamping bars 73 are employed to hold the flanges and web members of the girder 24 in assembled relation during the riveting operation.

In the operation of my improved apparatus, the gauntree riveter is mounted so as to be movable on the base plate 2, being held from tipping sidewise by means of the series of flanged wheels 11, the flanges 10 of these wheels engaging with the lower surface of the overhanging side of the gauntree track rails or bars 5 in preventing tipping of the gauntree on the base plate 2.

A girder or other structure 24 to be riveted, bolted together by clamping bars 73 and bolts 72, is mounted on the trucks 67 which travel on the track formed on the base plate 2 by the rails 3. 3. The hand wheels 71 on the trucks 67 are then turned to adjust the supports and bring the girder 24 into position so that the rows of rivet holes into which the rivets are to be driven will extend vertically.

The rivet snaps 54 and 55 are then secured in adjusted position in the ends of the plungers 52 and 53 of the actuating cylinders 50 and 51.

The motor 66 on top of the riveter is then rotated to raise or lower the rivet snaps 54, 55, until in alinement with the hole to be riveted. The rivet snaps are retracted and a heated rivet is inserted in the proper hole in the girder 24. The rivet snap 55 is then advanced by admitting fluid pressure into the rear end of the cylinder 51. The forward movement of the plunger 53 brings the rivet snap 55 into engagement with the head of the rivet within the hole of the girder 24. Fluid pressure is then admitted to the other cylinder 50 and the plunger 52 is advanced so as to cause the rivet snap 54 on this plunger to approach the other rivet snap 53. In this approaching movement the rivet snap 54 is brought into engagement with the heated end of the rivet to upset the rivet and form a head thereon. The rivet snaps are then retracted and are adjusted vertically on the jaws 19, 20, 21, 22, to bring the rivet snaps into alinement with the successive holes in a vertically extending row of holes in the girder, and the above described riveting operations are repeated in driving each rivet. After the rivets in any one vertical line of rivets have been driven, and the rivet snaps have reached the top edge of the girder being riveted, the gauntree is moved on the track rails 5, 5, and horizontal lines of rivets in the flanges are driven, up to a point which will bring the rivet snaps into alinement with the next row of holes in the girder. The rivets may be driven in this line of holes from the top toward the bottom of the girder or the rivet snaps may be moved by means of the motor 66 and feed screws 58 until again at the bottom of the girder, in which case the successive rivets will be driven from the bottom toward the top cover plate of the girder 24. After the rivets have been driven in the second line of holes the gauntree is again adjusted on the track rails 5, 5, of the base plate 2, and the above described operations are repeated until all of the necessary rivets have been upset and headed. The riveted girder is then removed from the throat 23 of the riveter and another girder after being positioned therein is riveted as has been described.

The advantages of my invention will be apparent to those skilled in the art. By means of my improved apparatus the necessity of turning large girders in riveting such girders and of moving the girders relative to the riveter is avoided and overcome. The girder is readily adjusted with the rows of holes in vertical and horizontal alinement. After being leveled the girder remains in such position until the completion of the rivet upsetting operations. By employing means forming a closed throat on the riveter, spreading of the jaws by the force of the rivet operations is prevented, and the depth of the throat which may be provided is materially increased over that possible with open throat riveters.

Modifications in the construction and arrangement of parts may be made. The means employed in actuating the rivet snaps may be other than the fluid pressure cylinder shown. The mechanism used in adjusting the snaps on the riveter may be changed and other variations in the details of construction may be made without departing from my invention as defined in the appended claims.

I claim:—

1. A gauntree riveter comprising a frame having opposite jaws forming an open throat, vertically adjustable, relatively movable rivet snaps in said throat, means for adjusting the rivet snaps vertically in said throat, means for causing a relative approach of said rivet snaps, a base on which said frame is movably mounted, means for moving the frame on the base, and means engaging with and preventing spreading of the open ends of said jaws in the rivet upsetting operations.

2. A gauntree riveter comprising a frame having opposite jaws forming an open throat, means for supporting the work being riveted within the throat, vertically ad-

justable and relatively movable rivet snaps in said throat, means for adjusting the rivet snaps vertically in said throat, means for causing a relative approach of said rivet snaps, a base on which the frame is movably mounted, and means for moving said frame on the base, said base having means engaging with and preventing spreading of the lower open ends of the jaws in the rivet upsetting operations.

3. A gauntree riveter comprising a frame having opposite jaws forming an open throat, means for supporting the work being riveted within the throat, vertically adjustable and relatively movable rivet snaps in said throat, means for adjusting the rivet snaps vertically in said throat, means for causing a relative approach of said rivet snaps, a base on which the frame is movably mounted and means for moving said frame on the base, said base having means engaging with and preventing spreading of the free ends of said jaws in the rivet upsetting operations, and means for adjusting the work vertically within said throat.

4. A gauntree riveter comprising a frame having opposite jaws forming an open throat, means for supporting the work being riveted within the throat, vertically adjustable and relatively movable rivet snaps in said throat, means for adjusting the rivet snaps vertically in said throat, means for causing a relative approach of said rivet snaps, a base on which the frame is movably mounted and means for moving said frame on the base, said base having means engaging with and preventing spreading of the free ends of said jaws in the rivet upsetting operations, means for adjusting the work longitudinally within the throat, and means for adjusting the work vertically within said throat.

5. A gauntree riveter comprising a frame having opposite jaws forming an open throat, sliding cross arms on the opposite jaws having vertically movable fluid pressure cylinders mounted thereon, means on the frame for adjusting the arms vertically on the opposite jaws, counterweights for said arms, pistons in said cylinders having rivet snaps removably secured thereon, means for supplying fluid pressure to said cylinders to cause a relative approach of the rivet snaps on said pistons, a base forming a track on which said frame is movably mounted, track wheels on the frame engaging said track rails, and means on the frame for rotating said wheels in moving the frame on said base, said track rails engaging with and preventing spreading of the jaws when said rivet snaps are actuated in the rivet upsetting operations.

6. A gauntree riveter comprising a frame having opposite jaws forming an open throat, vertically adjustable sliding cross arms on the opposite jaws having fluid pressure cylinders mounted thereon, means on the frame for adjusting the cross arms vertically, counterweights for said arms, pistons in said cylinders having rivet snaps removably secured thereon, means for supplying fluid pressure to said cylinders to cause a relative approach of the rivet snaps, a base forming a track on which said frame is movably mounted, track wheels on the frame engaging said track rails, and means on the frame for rotating said wheels in moving the frame on said base, said rails engaging with and preventing spreading of the jaws when the rivet snaps are actuated in the rivet upsetting operations, track rails forming a second track on said base, and wheeled trucks on said second track on which the work being riveted is supported during the riveting operations.

7. A gauntree riveter comprising a frame having opposite jaws forming an open throat, sliding cross arms on the opposite jaws having vertically movable fluid pressure cylinders mounted thereon, means on the frame for adjusting the cross arms, counterweights for said arms, pistons in said cylinders having rivet snaps removably secured thereon, means for supplying fluid pressure to said cylinders to cause a relative approach of the rivet snaps on said pistons, a base forming a track on which said frame is movably mounted, track wheels on the frame engaging said track rails, means on the frame for rotating said wheels in moving the frame on said base, said rails engaging with and preventing spreading of the jaws when the rivet snaps are actuated in the rivet upsetting operations, track rails forming a second track on said base, a plurality of wheeled trucks on said second track on which the work being riveted is supported during the riveting operations and means for adjusting the work on the trucks in positioning the work within said throat.

8. A gauntree riveter comprising a frame having opposite jaws forming an open throat, sliding cross arms on the opposite jaws having vertically movable fluid pressure cylinders mounted thereon, means on the frame for adjusting the cross arms vertically in unison, counterweights for said arms, pistons in said cylinders having rivet snaps removably secured thereon, means for supplying fluid pressure to said cylinders to cause a relative approach of the rivet snaps on said pistons, a base forming a track on which said frame is movably mounted, track wheels on the frame engaging said track rails, and means for rotating said wheels in moving the frame on said base, said rails engaging with and preventing spreading of the jaws when said rivet snaps are actuated in the rivet setting operations, track rails forming a second track on said base, a plu-

rality of wheeled trucks on said second track on which the work being riveted is supported during the riveting operations, and means for adjusting the work on the trucks in positioning the work within said throat.

9. A gauntree riveter comprising a frame having opposite jaws forming a throat, sliding cross arms on the opposite jaws having relatively movable rivet snaps mounted thereon, means on the frame for adjusting the arms vertically, means for causing a relative approach of the rivet snaps, a base forming a track on which said frame is movably mounted, track wheels on the frame engaging said track rails, and means on the frame for rotating said wheels in moving the frame, said rails engaging with and preventing spreading of the jaws when said rivet snaps are actuated in the rivet setting operations, track rails forming a second track on said base, a plurality of wheeled trucks on said second track on which the work being riveted is supported during the riveting operations, means for adjusting the work vertically in positioning the work in said throat, and means for maintaining the work in adjusted position on said trucks.

In testimony whereof I have hereunto set my hand.

CHARLES J. WALKER.

Witnesses:
HARRY GEOGHEGAN,
CHESTER H. MERRILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."