M. W. TALEN.

RIVETING OR PUNCHING MACHINE.

APPLICATION FILED AUG. 23, 1907.

952,151. Patented Mar. 15, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

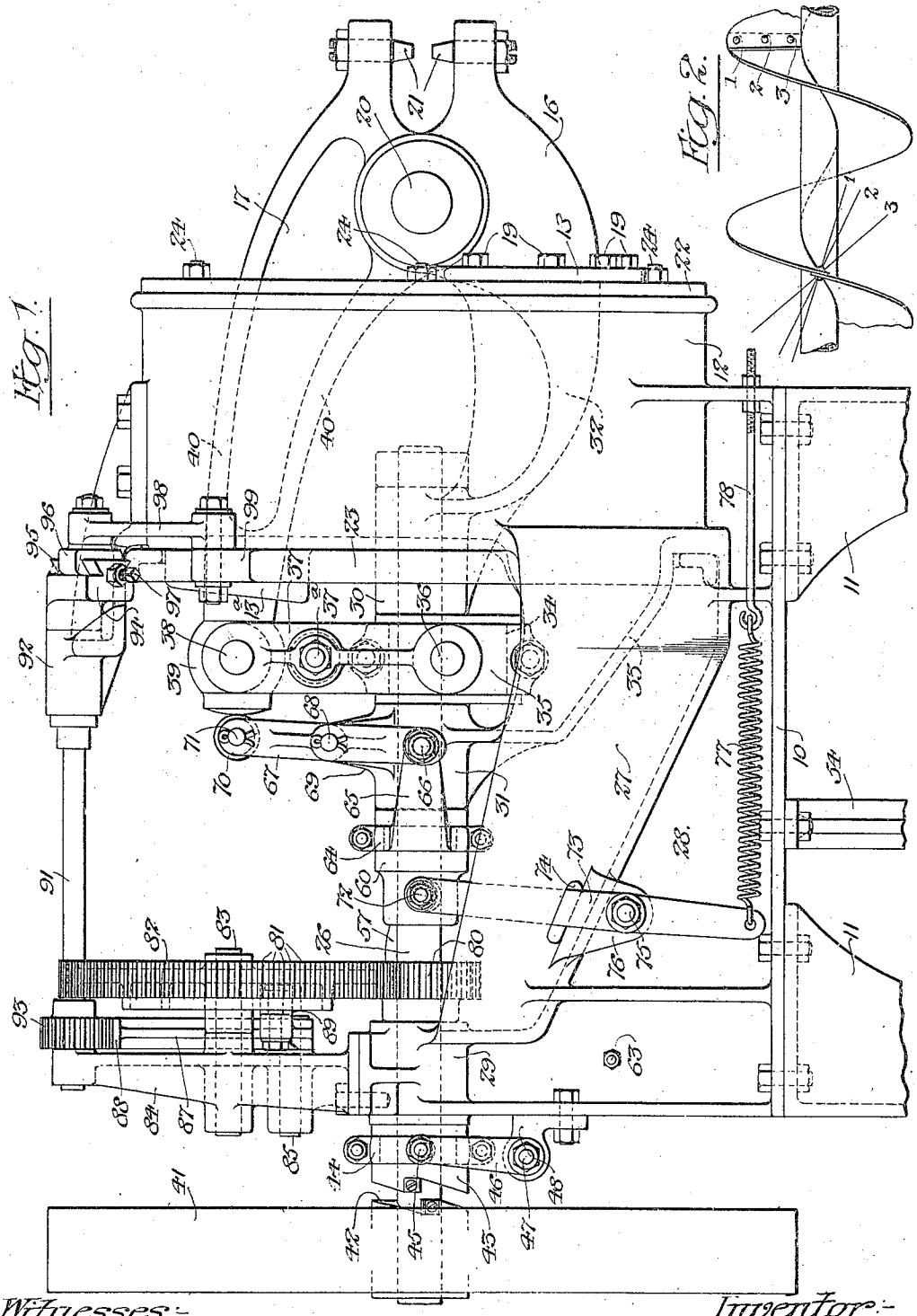

Fig. 2.

Witnesses:-
Louis F. Whitehead
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3 SHEETS—SHEET 2.

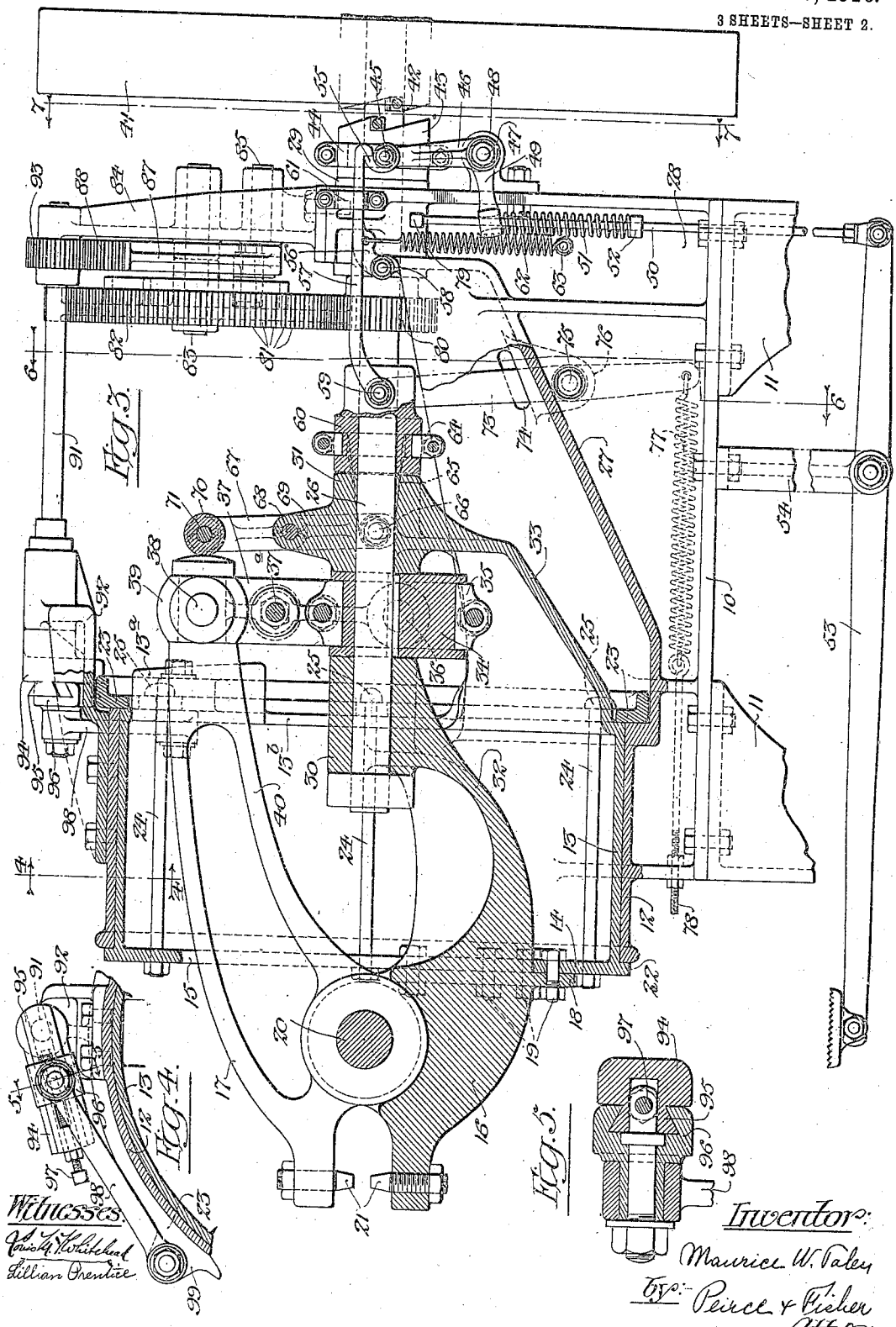

Fig. 3.

Fig. 4.

Fig. 5.

Witnesses:

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3 SHEETS—SHEET 3.

Fig. 7.

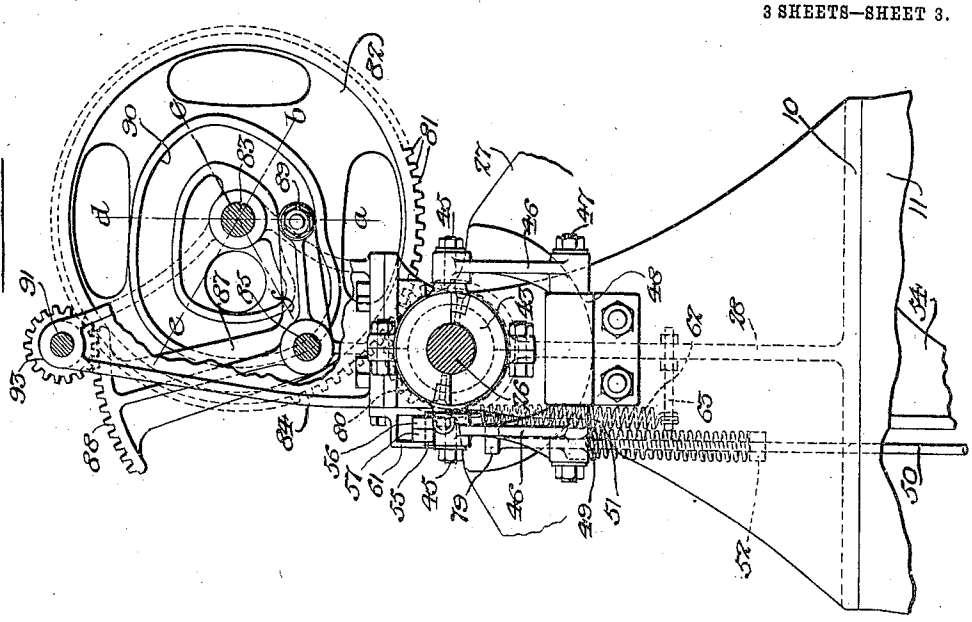
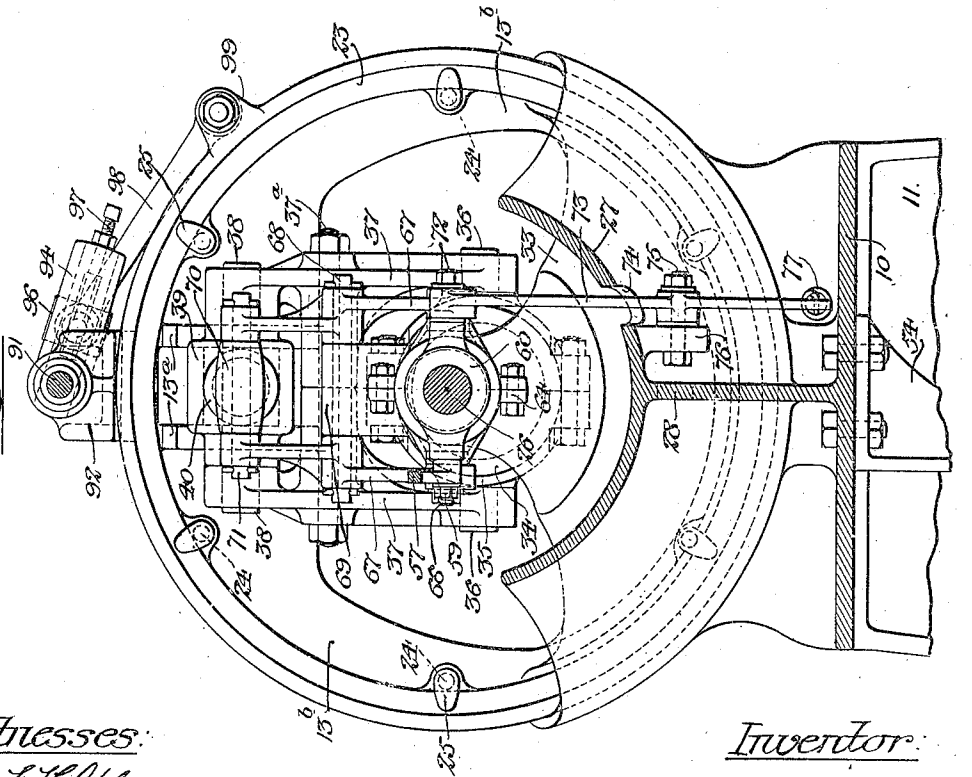


Fig. 6.



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UNITED STATES PATENT OFFICE.

MAURICE W. TALEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO WELLER MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION.

RIVETING OR PUNCHING MACHINE.

952,151. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed August 23, 1907. Serial No. 389,840.

To all whom it may concern:

Be it known that I, MAURICE W. TALEN, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Riveting or Punching Machines, of which the following is declared to be a full, clear, and exact description.

The invention relates to riveting or punching machines and seeks to provide an improved form of machine by which rivets which are of different angles to the given base line, may be readily set by which holes may be punched at different angles to one another, and the invention consists in the features of construction, combinations and arrangements of parts hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings, which illustrate an embodiment of the invention particularly designed for setting the rivets that connect the sections of a spiral conveyer, Figure 1 is a view in elevation. Fig. 2 is a view in elevation of a portion of a spiral conveyer. Fig. 3 is a longitudinal section through the machine. Fig. 4 is a detail section on the line 4—4 of Fig. 3. Fig. 5 is a detail enlarged section on the line 5—5 of Fig. 4. Fig. 6 is a cross section through the machine on the line 6—6 of Fig. 3. Fig. 7 is a detail cross section on the line 7—7 of Fig. 3.

The invention comprises broadly a head rotatably mounted in a suitable frame and including a pair of relatively shiftable jaws or tool holders with mechanism for properly and automatically controlling the operation of the jaws for setting rivets or punching holes that are at different angles to one another or to a common base line.

As stated, the particular embodiment of the invention illustrated in the drawings, is designed for setting rivets which connect the sections of spiral conveyers. A portion of such a conveyer is illustrated in Fig. 2. The spiral blade of the conveyer is built up from separate steel plates which are rolled to proper shape and then riveted together to form one continuous spiral. The overlapping portions of the separate spiral sections are connected together by rivets which are placed at different distances from the axis of the spiral. In the form shown in Fig. 2, three rivets, 1, 2 and 3, are employed at each joint and, since they are at different distances from the center of the spiral, they will be at different angles to the axis, as indicated in Fig. 2. The improved machine provides means whereby these rivets may be rapidly and successively set and which obviates the necessity of moving the work about to bring the different rivets into proper relation with the jaws or tool holders of the machine.

The machine illustrated in the drawings comprises a frame 10 which is mounted upon suitable supports or legs 11. At one end the frame is provided with a stationary cylindrical casing 12, the axis of which is horizontal. The rotatable head comprises a pair of relatively shiftable coöperating jaws, one of which, in the machine illustrated, is relatively fixed and the other movable in a direction transverse to the axis of rotation of the head. In the form illustrated, the rotatable head also includes a hollow, cylindrical portion 13 which fits rotatably within the cylindrical casing 12 of the machine frame. The outer end or head 14 of the hollow, cylindrical portion 13 is provided with an opening 15 in which the fixed and movable jaws 16 and 17 are arranged. The fixed jaw 16 is provided with a flange 18 which overlaps and is connected with the end or head 14 by a series of bolts 19. The movable jaw 17 is connected by a pivot 20 to the fixed jaw 16 and the jaws are provided with suitable tools or dies 21.

The outer end of the cylindrical portion 13 of the head is provided with a lip or projecting shoulder 22 which engages the outer end of the cylindrical casing 12 of the frame. A ring 23 abuts against the inner ends of the casing 12 and of the cylindrical portion 13 of the head and is secured to the head by a series of bolts 24 extending through the cylindrical portion 13 of the head and having outwardly projecting lugs or heads at their inner ends which overlap the ring 23.

The main operating shaft 26 of the machine is horizontally mounted and is concentric with the cylindrical casing 12 of the machine frame and with a rotatable head mounted therein. The axis of the shaft is also in the same plane with the axis of the hinged pivot 20 between the fixed and movable jaws or tool holders. That is to say,

the center line of the main operating shaft 26, if extended, would intersect the axis of the hinged pivot 20.

The frame 10 is provided with a semi-conical portion 27 which extends upwardly from the cylindrical casing 12 supported from the base plate of the frame by a central web 28. This portion of the frame carries at its upper, outer end a bearing 29 for the outer end of the operating shaft 26. The inner end of the shaft 26 is journaled in bearings 30 and 31 to form respectively, inwardly and upwardly projecting parts 32 and 33 of the fixed jaw 16 and the cylindrical portion 13 of the rotating head. Bearings 30 and 31 therefore, rotate with the head having the relatively movable jaws or tool holders.

An eccentric 34 is keyed to the shaft 26 between the bearings 30 and 31 and is provided with a split eccentric strap 35 having oppositely disposed projecting pintles 36. A pair of links 37 connect the pintles 36 of the eccentric strap and pintles 38 upon a yoke 39 that is swiveled to the inner end of an upwardly and inwardly projecting part 40 of the movable jaw or tool holder 17. The rotation of the shaft 26 and eccentric 34 relatively to the rotating head will therefore serve to operate the movable jaw for setting rivets or punching holes. The particular form of dies or tools shown is more particularly adapted, as stated, for setting rivets but the arrangement thereof could be varied and adapted for punching holes and the like without departure from the broad scope of the invention. A flange 13^b at the inner end of the cylindrical portion 13 is slotted and provided with a pair of guide lugs 13^a for the end portion 40 of the movable jaw.

Suitable means are provided for driving the shaft 26. In the form shown, a drive pulley 41 is loosely mounted on the shaft and its hub 42 is provided with clutch teeth on its inner end so as to form one of the clutch members for coupling the pulley to the shaft. The other clutch member is in the form of a sleeve 43 keyed upon the shaft to rotate therewith but longitudinally shiftable on the shaft into and out of engagement with the companion clutch member 42. A split ring 44 engages an annular groove in the clutch sleeve or member 43 and is provided at opposite sides with laterally projecting pintles 45 which engage the upper ends of a pair of arms 46 mounted on a short cross shaft 47. This shaft is journaled in the bracket 48 on the end of the frame (see Figs. 3 and 7) and is provided at one end with an inwardly extending arm 49. This arm is provided at its inner end with an opening through which a vertical rod 50 extends. A spring 51 coiled about the rod 50 is interposed between the arm 49 and a collar 52 fixed to the rod below the arm. The rod 50 extends downwardly through the base plate of the frame and is connected to the rear end of the foot lever 53 which is pivoted between its ends upon a bracket 54 that depends from the base plate of the frame 10. One of the arms 46 connected to the sliding clutch member 43 is provided at its upper end with a projecting lug or shoulder 55 (see Figs. 3 and 7) which is arranged to be engaged by the hooked shaped ends of a latch 56 and a throw-out trip 57. The latch 56 is connected by a pivot pin 58 to the frame and the throw-out trip 57 is connected by a pivot pin or bolt 59 to a sliding collar or sleeve 60 on the shaft 26. The latch 56 and throw-out trip 57 extend outwardly through an opening in a guide bracket 61 fixed to the frame and their outer hooked ends normally engage the shoulder 55 to hold the clutch members disengaged. The latch 56 is yieldingly held in its lowermost position by a spring 62 extending between the latch and a pin 63 that projects laterally from the central web 28 of the machine frame. The opening in the guide bracket 61 is of sufficient height to permit the shift of the latch and throw-out trip in vertical direction into and out of engagement with the shoulder 55 on the arm 46.

The sliding sleeve 60 on the shaft 26 is provided with an annular groove in which is arranged a split ring 64 having inwardly projecting arms 65 (see Fig. 1). Pivot bolts 66 on the lower ends of these arms are arranged to engage slots in the lower ends of a pair of arms or links 67. These arms are pivoted intermediate their ends by a bolt 68 to the end of a projection 69 on the bearing 31. A roller 70 carried between the outer ends of the arms 67 by a cross pin or bolt 71, is arranged to engage the rounded inner end of the portion 40 of the movable jaw 17.

The sliding sleeve or collar 60 is connected on one side by the pivot bolt 59 to the throw-out trip 57, as described (see Fig. 3). On the opposite side (see Fig. 1) it is connected by a pivot bolt 72 to the upper end of a rocking lever 73 which projects through an opening 74 in the semi-conical portion 27 of the machine frame and which is pivoted intermediate its ends by a bolt 75 to a depending lug 76 on the semi-conical portion of the frame. The lower end of the rock lever 73 is connected by a coiled spring 77 to a hooked rod 78 adjustably threaded through a flange at the head end of the machine frame. The spring 77 tends to throw the upper end of the lever 73, the sleeve 60 and the throw-out trip pawl 77 connected thereto outwardly (or toward the right in Fig. 3), and also tends to move upper end of the arms 67 inwardly and holds the roller 70 thereon snugly in engagement with the end of the projection on the movable jaw. The arms

67 are shifted as the inner end of the movable jaw is raised and lowered to shift the sliding sleeve and throw-out trip longitudinally. The throw-out trip and sleeve 60 are of course held against rotation by the rock lever 73. The operating arm or arms 67 are however free to rotate with the rotatable head because of the ring and groove connection between the lower ends of the arms 67 and the sliding sleeve.

The upper end of the trip rod 50 which is connected to the treadle 53 is provided with a head 79 which is arranged to engage and shift both the latch 56 and the throw-out trip 57 to release the sliding clutch member 43 which, as stated, is normally held in inoperative position by the engagement of the hooked ends of the latch and throw-out trip with the lug 55. When the work is in proper position for the operation of the jaws or tool holders, the operator will depress the outer end of the foot lever 53 and elevate the trip rod 50. This will first compress the spring 51 between the lug 52 and the arm 49 and then the head 79 on the rod 50 will shift the latch 56 and throw-out trip 57 out of engagement with the lug 55 and the clutch member 43 will be quickly shifted into engagement with the clutch member 42 by the compressed spring 51 acting through the arm 49, shaft 47 and arms 46. The shaft 26 and eccentric 34 thereon will then be rotated to operate the movable jaw or tool holder to clench the rivet placed between the dies or tools 21. During the operative movement of the jaws toward each other, the inner end of the portion 40 of the movable jaw will move outwardly beyond the roller 71 on the arms 67 so that the upper ends of the arms may be moved inwardly or toward the left in Fig. 3 by the springs 77 and the sleeve 60 and throw-out trip 57 are moved outwardly or toward the right to bring the hooked end of the throw-out trip above the shoulder 55 on the arm 46, so that, when the treadle 53 is released and the rod 50 shifted to normal position by the spring 51, the throw-out trip 57 will drop by gravity and bring its hooked end into reëngagement with the lug 55. During the opening movement of the jaws or tool holders, the inner end of the portion 40 of the movable jaw will be restored to the position shown in the drawings and will shift the throw-out trip 57 through the medium of the arms 67, ring 64 and sliding sleeve 60 to disengage the clutch member 43 and check the operation of the drive shaft. The operation is thus arrested when the jaws are restored to their normal open position, or after a single complete operation of the machine effected by a single revolution of the shaft 26 relatively to the rotatable head. It is obvious that the mechanism for actuating the jaws or tool holders and for automatically disengaging the clutch will be operative in any position of the rotating head. It is also obvious that the rotating head may be shifted to set rivets or punch holes and the like, which are at different angles to each other as are the rivets for connecting the sections of a spiral conveyer.

Preferably, means are provided for automatically shifting the rotating head for setting the successive rivets. For this purpose shaft 26 is provided adjacent its outer end with a spur pinion 80 which meshes with the gear teeth 81 on the periphery of a cam 82. This cam is journaled upon a short stud shaft 83 mounted in an upright bracket 84 at the rear end of the machine above the main shaft bearing 29. A short stud shaft 85 also mounted in the bracket or upright 84 carries a bell crank 87, one arm of which is provided with a toothed segment 88 and the other arm with a pin or roller 89 engaging the groove 90 of the cam 82. A counter shaft 91 is journaled at its rear end in the upper end of the bracket or upright 84 and at its outer end in a bracket 92 that is bolted to the upper part of the cylindrical casing 12 of the machine frame. This shaft carries at its rear end a pinion 93 which meshes with the gear segment 88 and at its forward end is provided with a crank arm 94. This crank arm is provided with a dovetail guide 95 whereon is mounted a slide 96 which may be adjusted on the crank arm by means of a screw 97. A pitman-rod 98 is pivotally connected at one end to the slide 96 and at its other end to a lug 99 on the ring 23. The movement of the cam 82 thus serves through the medium of the mechanism described, to rotate the head having the relatively movable die or tool holders so that the die or tool holders may operate in different planes or at different angles.

The particular form of mechanism shown in the drawings is designed for riveting the joints of a spiral conveyer such as shown in Fig. 2, in which three rivets are employed at each joint. In this form the cam gear 82 is three times the size of the small pinion 80 on the drive shaft 26 so that three revolutions of the drive shaft are necessary to complete a single revolution of the cam gear and the cam gear is moved through a third of a revolution at each operation of the machine. The groove 90 of the cam is so arranged that during the setting of the rivet the rotatable head is held stationary and the angular movement of the head necessary to bring the jaws into proper position to set the next rivet is effected during the restoring or opening movement of the jaws or tool holders. That is to say, assuming the parts are in the position shown in Fig. 7, the jaws or tool holders will be closed to set the first rivet while the portion of the cam grooved between the lines *a* and *b* is operating on the roller 89 to hold the rotatable head station-

ary. As the jaws open after setting the first rivet, the part of the cam groove between the lines *b* and *c* will rotate the head and jaws or tool holders forming part thereof through a sufficient angle to properly set the next rivet in the joint of the spiral conveyer, and the operator therefore need not twist and swing the work around to bring the second rivet into proper relation with the setting dies. At the second operation of the machine for setting the second rivet, the part of the cam groove between the lines *c* and *d* will operate on the roller 89 and parts connected thereto to hold the rotatable head stationary while the jaws thereof are moving together to clench the second rivet, and as the jaws open, the part of the cam groove between the lines *d* and *e* will effect the further shift of the rotatable head for setting the third rivet. At the third operation of the machine, the jaws will be brought together to set the rivet while the part of the cam groove between the lines *e* and *f* is acting upon the bell crank 87 to hold the head stationary and after the third rivet is set the part of the cam groove between the lines *f* and *a* will be brought into operation to turn the head back in the opposite direction ready to set the first rivet of the next joint. Other forms of cams could of course be used for effecting different kinds of work and interchangeable gears could be supplied with the same machine for making joints with two or four rivets or for making the joints of right and left hand spiral conveyers.

The throw of the mechanism for rotating the head may be readily varied as desired or necessary by adjusting the position of the slide 96 upon the crank arm 94. The initial position of the head with respect to the mechanism for shifting the same may be changed as desired by loosening the nuts on the bolts 24 and adjusting the head with respect to the ring 23 which is connected to the head shifting mechanism. In this way the head may be properly set in position to clench the first rivet of the joint in a spiral conveyer and the throw of the head-shifting means adjusted to move the head sufficiently at the end of each operation to bring the jaws thereof in proper position for setting the successive rivets which occupy different angular positions.

It should be noted that the arms 67 which automatically operate the throw-out for the clutch, rotate with the jaws or tool holders of the head and are controlled thereby so as to throw out the clutch when the jaws are opened and this operation is properly effected in any position of the rotating head.

It is obvious that numerous changes may be made in the details of structure set forth without departure from the essentials of the invention.

While the particular form of machine set forth is designed for setting rivets, it is obvious that the jaws or the dies or tools thereof may be suitably modified for punching holes.

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

1. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in said frame and comprising a pair of coöperating jaws relatively shiftable to and from each other in a direction transverse to the axis of rotation of said head, a drive shaft journaled in said frame and mechanism actuated by said shaft for operating said jaws in the different angular positions thereof.

2. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the frame and comprising a pair of relatively shiftable jaws, a drive shaft, means actuating said shaft for automatically shifting said head, and mechanism actuated by said shaft for operating the jaws in the different positions of said head.

3. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of coöperating jaws relatively shiftable in a direction transverse to the axis of rotation of said head, means for automatically shifting said head at the end of each operation of said jaws whereby the succeeding operation of said jaws will be in a different plane and mechanism for operating said jaws in the different positions of said head.

4. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising coöperating jaws relatively shiftable in a direction transverse to the axis of rotation of said head, mechanism for operating said jaws in the different positions of said head and means controlled by said operating mechanism for automatically shifting said head at each operation of said jaws.

5. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising relatively shiftable jaws, mechanism for operating said jaws in the different positions of said head, means controlled by said operating mechanism for automatically shifting said head at the end of each operation of said jaws, and means for varying the throw of said head-shifting means.

6. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the frame comprising a pair of coöperating jaws relatively shiftable in a direction transverse to the axis

of rotation of said head, mechanism for operating said jaws in the different positions of said head, and an automatic throw-out for said operating mechanism arranged to act at the end of each operation of said jaws.

7. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of relatively shiftable jaws, mechanism for operating said jaws in the different positions of said head, means controlled by said operating mechanism for automatically shifting said head at each operation and an automatic throw-out for said operating mechanism controlled by the movement of said jaws and arranged to act at the end of each operation thereof.

8. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of coöperating jaws relatively shiftable in a direction transverse to the axis of rotation of said head, mechanism for operating said jaws in the different positions of said head, a clutch controlling the operation of said mechanism, means for tripping said clutch into operation, a throw-out for said clutch arranged to act automatically at the end of each operation of said jaws and means controlled by said operating mechanism for automatically shifting said head at the end of each operation of said jaws.

9. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising coöperating jaws, one relatively fixed and the other movable in a direction transverse to the axis of rotation of said head, mechanism for operating said movable jaw in the different positions of said head, means controlled by said operating mechanism for automatically and successively shifting said head at the end of each operation of the machine and a throw-out for said operating mechanism automatically arranged to act at the end of each operation of said movable jaw.

10. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising coöperating jaws, one relatively fixed and the other movable in a direction transverse to the axis of rotation of said head, an operating shaft concentric with said head, an operating connection between said shaft and the movable jaw and rotatable with said head and means driven from said shaft for automatically and successively shifting said head at the end of each operation.

11. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of coöperating jaws, one relatively fixed and the other movable in a direction transverse to the action of rotation of said head, an operating shaft concentric with said rotatable head and an operating connection rotatable with said head and extending between said shaft and the movable jaw.

12. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of relatively fixed and movable jaws, a shaft concentric with said rotatable head, operating connections between said shaft and the movable jaw, a clutch on said shaft, means for tripping said clutch into operation, a throw-out for said clutch and an arm mounted on and rotatable with said head and controlled by the operation of said movable jaw for shifting said clutch throw-out.

13. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of coöperating jaws, one relatively fixed and the other movable in a direction transverse to the axis of rotation of said head, a shaft mounted in the machine frame concentric with said rotatable head, an operating connection between said shaft and the movable jaw, a drive pulley loose on said shaft, clutch members on said shaft for connecting the pulley thereto, a throw-out trip normally holding said clutch in disengaged position, means for releasing said throw-out trip to engage said clutch members, an arm mounted on and rotatable with said head and controlled by the operation of said movable jaw for operating said throw-out trip to disengage said clutch members at the end of each operation of the machine and means driven from said shaft for automatically and successively shifting said rotatable head at the end of each operation.

14. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of relatively fixed and movable jaws, a shaft concentric with said rotatable head, an operating connection between said shaft and the movable jaw, a drive pulley on said shaft, a clutch for connecting said pulley to said shaft, means for throwing said clutch into operation, a throw-out for said clutch automatically arranged to act at the end of each operation, a cam journaled in the machine frame and driven from said shaft and means operated by said cam for successively and automatically shifting said head at the end of each operation.

15. In a riveting or punching machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a pair of relatively

fixed and movable jaws, a shaft concentric with said rotatable head, an operating connection between said shaft and the movable jaw, a drive pulley on said shaft, a clutch for connecting said pulley to said shaft, means for throwing said clutch into operation, a throw-out for said clutch automatically arranged to act at the end of each operation, a cam journaled in the machine frame and geared to said shaft and means interposed between said cam and said rotatable head for automatically and successively shifting said head at the end of each operation, said means comprising a countershaft, a pitman rod connecting said shaft and head and means for adjusting the throw of said pitman rod.

16. In a riveting machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a fixed jaw and a movable jaw coöperating therewith, a shaft mounted on the machine frame concentric with said rotatable head, an operating connection between said shaft and the pivoted jaw, means for intermittently operating said shaft and means driven from said shaft for automatically shifting said rotatable head at each operation.

17. In a riveting machine, the combination with the machine frame, of a head rotatably mounted in the machine frame comprising a fixed jaw and a movable jaw cooperating therewith, a shaft mounted in the machine frame concentric with said rotatable head, a clutch for coupling said shaft with a suitable source of power, means for throwing said clutch into operation, an automatic throw-out for said clutch arranged to act at the end of each operation, a cam driven from said shaft and connections between said cam and said rotatable head for automatically shifting the latter at the end of each operation.

18. In a riveting machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a fixed jaw and a movable jaw coöperating therewith, a shaft journaled in the machine frame and concentric with said rotatable head, an operating connection between said shaft and the movable jaw, a pulley loose on said shaft, clutch members for coupling said pulley to said shaft, a throw-out trip normally holding said clutch members apart, a sliding sleeve on said shaft to which said throw-out trip is connected, an arm mounted on and rotatable with said head and controlled by the movement of said movable jaw and connections between said arm and said sliding sleeve for operating said throw-out trip to disengage the clutch members at the end of each operation.

19. In a riveting machine, the combination with the machine frame, of a head rotatably mounted in the machine frame and comprising a fixed jaw and a movable jaw pivoted thereto, a shaft mounted in the machine frame concentric with said rotatable head, an operating connection between said shaft and the pivoted jaw, a drive pulley loose on said shaft, clutch members on said shaft for coupling said drive pulley thereto, a throw-out trip normally holding said clutch members apart, means for releasing said throw-out trip and engaging said clutch members, a sliding spring-held sleeve on said shaft whereon said throw-out trip is mounted, a ring engaging a groove in said sleeve, an arm mounted on and rotatable with said head and connected to said ring, the end of said pivoted jaw being arranged to engage the free end of said arm and operate the same to shift said sleeve and throw-out trip and disengage said clutch members at the end of each operation.

20. In a riveting machine, the combination with the machine frame, of a rotatable head mounted in the machine frame and comprising a fixed jaw and a movable jaw coöperating therewith, a shaft mounted in the machine frame concentric with said rotatable head, an eccentric on said shaft, an eccentric strap therefor, links connecting said eccentric strap to said movable jaw and means driven from said shaft for automatically rotating said head at the end of each operation.

21. In a riveting machine, the combination with the machine frame, of a rotatable head mounted in the machine frame and comprising a fixed jaw and a movable jaw pivoted thereto, a shaft mounted in the machine frame concentric with said rotatable head, an eccentric on said shaft, an eccentric strap therefor, links connecting said eccentric strap to said movable jaw, means on said shaft for automatically and successively shifting said rotatable head at the end of each operation, a clutch on said shaft for coupling the same to a suitable source of power, means for throwing said clutch into operation, an arm mounted on and rotatable with said head and arranged to be shifted by the movement of said pivoted jaw and means arranged to be controlled by said arm for releasing said clutch at the end of each operation.

22. In a riveting machine, the combination with the machine frame, of a stationary cylindrical casing at one end of the machine frame, of a rotatable head comprising a hollow cylindrical portion rotatably mounted within the stationary cylindrical casing of the machine frame, a fixed jaw mounted within and secured to said hollow cylindrical portion and a movable jaw mounted within said hollow cylindrical portion and coöperating with said fixed jaw, a shaft

journaled in said frame and concentric with said cylindrical casing and said rotatable head, an operating connection between said shaft and said movable jaw, means for connecting said shaft to and disconnecting the same from a suitable source of power and means driven from said shaft for automatically and successively shifting said rotatable head at the end of each operation.

23. In a riveting machine, the combination with the machine frame, of a stationary cylindrical casing at one end of the machine frame, of a rotatable head comprising a hollow cylindrical portion rotatably mounted within the stationary cylindrical casing of the machine frame, a fixed jaw mounted within and secured to said hollow cylindrical portion and a movable jaw mounted within said hollow cylindrical portion and pivoted to said fixed jaw, a shaft journaled in said frame and concentric with said cylindrical casing and said rotatable head, the cylindrical portion of said head and said fixed jaw having bearings for one end of said shaft, an eccentric keyed to the shaft between said bearings, a strap on said eccentric, links connecting said strap with the free end of the pivoted jaw, a clutch on said shaft for coupling the same to a suitable source of power, means for throwing said clutch into operation, an automatic throw-out for said clutch arranged to act at the end of each operation of the machine, and means driven from said shaft for shifting said rotatable head at the end of each operation.

24. In a riveting machine, the combination with the machine frame, of a stationary cylindrical casing at one end of the machine frame, of a rotatable head comprising a hollow cylindrical portion rotatably mounted within the stationary cylindrical casing of the machine frame, a fixed jaw mounted within and secured to said hollow cylindrical portion and a movable jaw mounted within said hollow cylindrical portion and coöperating with said fixed jaw, a shaft journaled in said frame and concentric with said cylinder casing and said rotatable head, the cylindrical portion of said head having a bearing for one end of said shaft, an operating connection between said shaft and said movable jaw, a clutch on said shaft, a throw-out for said clutch, an arm pivoted on said bearing and engaged and operated by said movable jaw, operating connections between said arm and said clutch throw-out.

25. In a riveting machine, the combination with the machine frame having a stationary cylindrical casing at one end, of a rotatable head comprising a hollow cylindrical portion rotatably mounted within the stationary cylindrical casing of the machine frame, a fixed jaw secured to said hollow cylindrical portion and a movable jaw pivoted to said fixed jaw, a shaft mounted in the machine frame concentric with said rotatable head, an operating connection between said shaft and said movable jaw, a drive pulley on said shaft, clutch members for coupling said pulley and shaft, means for engaging said clutch members, an automatic throw-out for said clutch members, a ring adjustably secured to the cylindrical portion of said head, a cam driven from said shaft and operating connections between said cam and said ring for automatically shifting said head at the end of each operation of the machine.

MAURICE W. TALEN.

Witnesses:
LILLIAN PRENTICE,
KATHARINE GERLACH.