May 31, 1932. F. M. LITTELL ET AL 1,861,186

TURNING DEVICE FOR FLAT SIDED RIVETS

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Fig. 1.

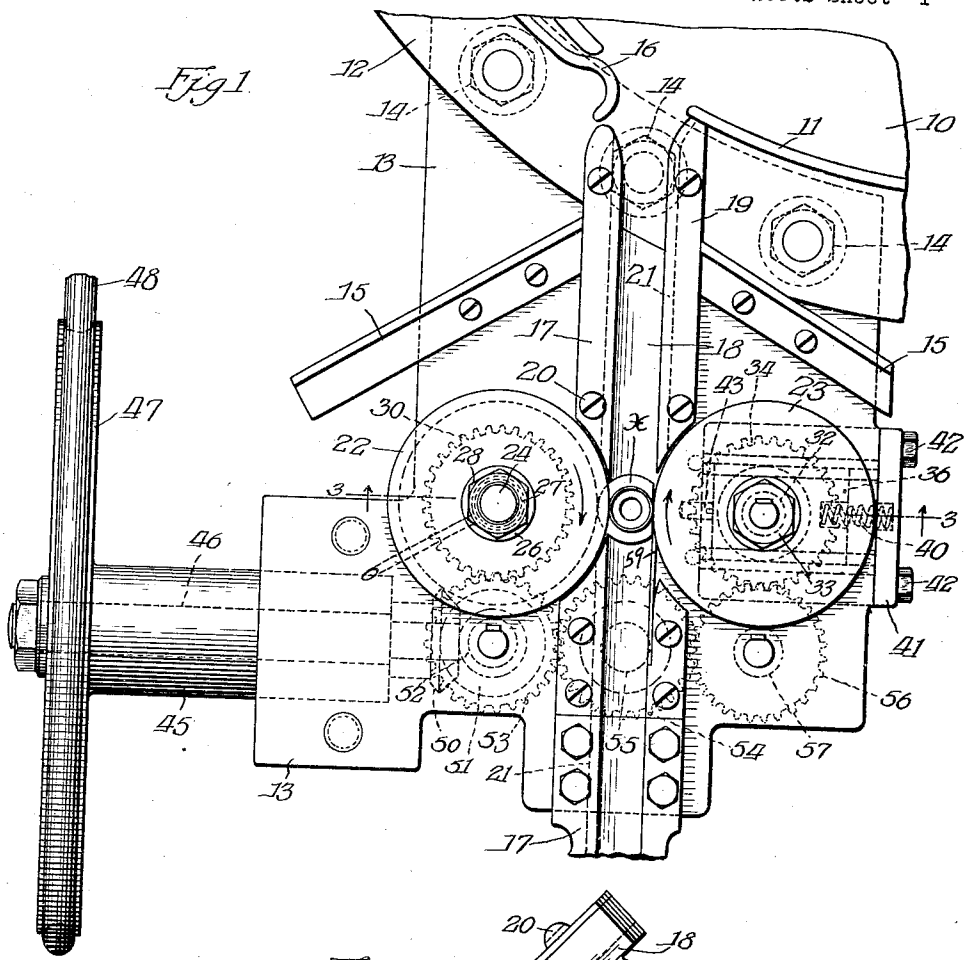
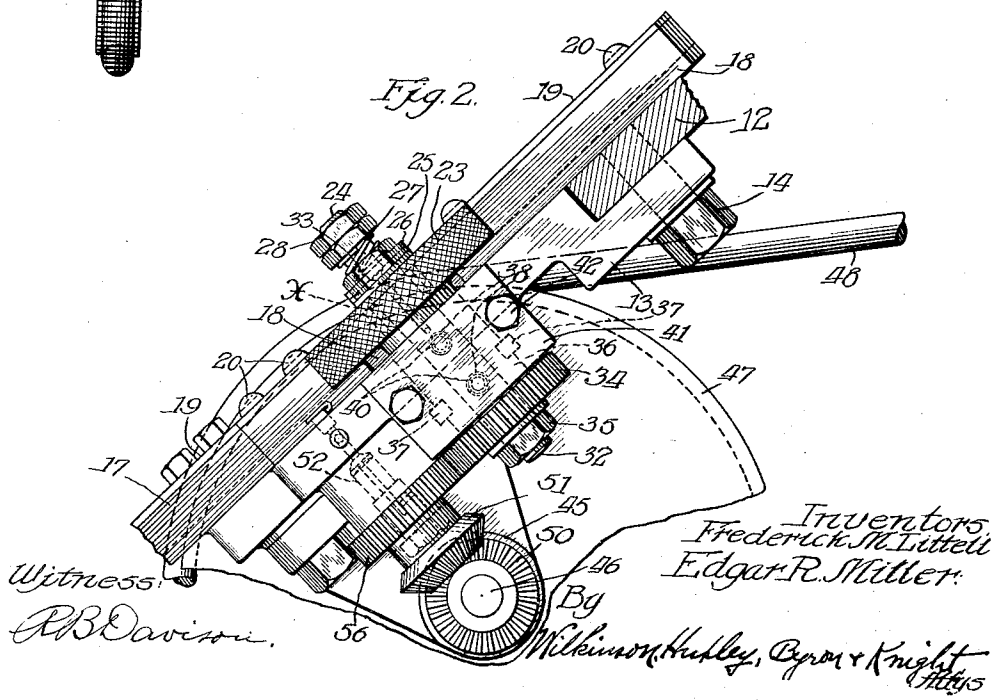


Fig. 2.



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Fig 3

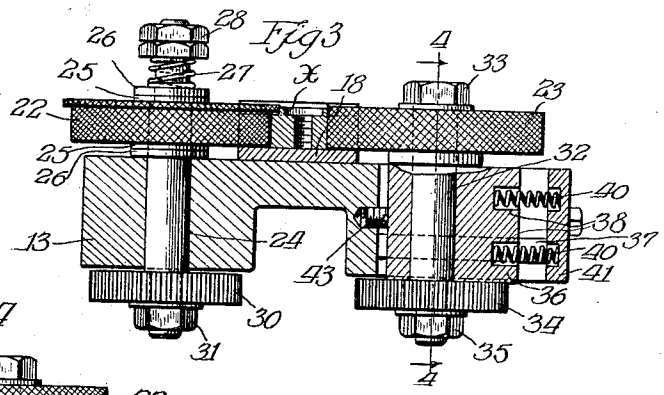


Fig 4

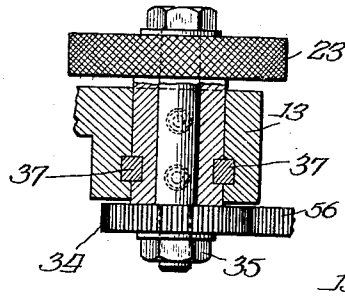


Fig 5

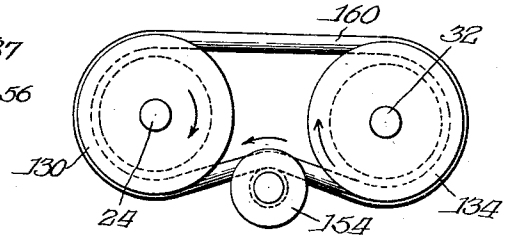


Fig 6

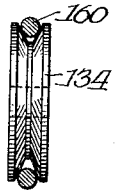


Fig 8

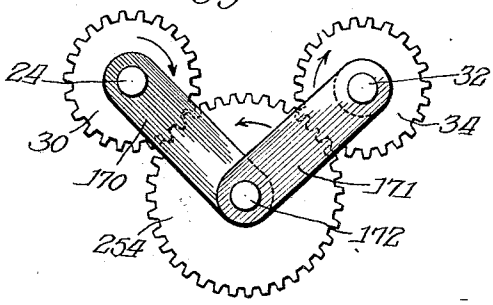


Fig 9

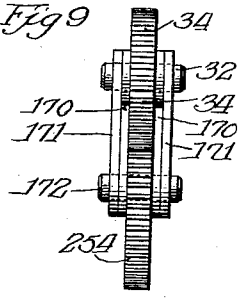
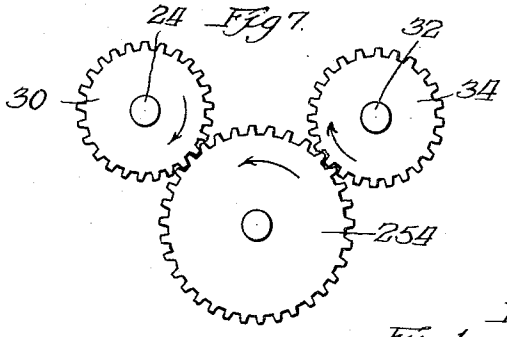


Fig 7



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Patented May 31, 1932 1,861,186

UNITED STATES PATENT OFFICE

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TURNING DEVICE FOR FLAT SIDED RIVETS

Application filed March 20, 1930. Serial No. 437,412.

The invention relates to rotary turning devices and has reference more particularly to rotary mechanism for turning non-circular articles.

In the type of presses with which the present invention is adapted to be associated, a hopper is generally employed for storing the rivet members, which hopper is actuated so as to feed the rivet members individually to a chute connected with the hopper whereby the chute serves to present the rivet members in proper relation to the operating parts of the press. Generally the hopper mechanism is designed to accommodate a considerable number of rivet members, enough to constitute a supply for the rivet machine to last for a considerable length of time. Also, since it is necessary in dealing with rivet members of non-circular contour to present the rivets to the working part of the machine with their flat side in substantial alignment, the hoppers have been constructed to not only feed the rivets to the chute individually but to also align the rivets so as to locate their flat side in a particular direction, in which position the rivet is then ejected into the chute and thus presented to the riveting press.

One of the objects of the present invention is to obviate the necessity of employing a type of hopper having the complicated mechanism necessary to align the non-circular rivets before presenting them to the chute and accordingly the present invention contemplates an improved rotary turning device whereby the rivets are turned during their travel towards the riveting press so as to align the rivets with their flat portion facing in the same direction.

A further object of the present invention is to provide a novel form of rotary turning device which will be adapted for turning non-circular members during their travel along a chute and which will also embody means for preventing jamming of the members.

A further object is to provide a rotary turning device which will be capable of aligning non-circular members so that their flat portion will be facing in the same direction at a speed greater than has heretofore been possible, so that the capacity of the rivet press will be correspondingly increased.

A yet further object is to provide a rotary turning device which will be simple in construction and efficient and positive in operation.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate an embodiment of the device and wherein like reference characters are used to designate like parts—

Figure 1 is a plan view of a rotary turning device constructed in accordance with the present invention.

Figure 2 is a side elevational view thereof.

Figure 3 is a sectional view taken along line 3—3 of Figure 1.

Figure 4 is a sectional view taken along line 4—4 of Figure 3.

Figure 5 is a modified form of drive mechanism for the rotary elements.

Figure 6 is an end elevation of the same.

Figure 7 is another modified form of gear drive mechanism.

Figure 8 is still another modified form of gear drive mechanism employing connecting links.

Figure 9 is an end elevational view thereof.

Referring to the drawings, it is noted that the present invention is adapted for association with a hopper structure comprising a rotating base 10 provided with upstanding flange 11, which provides a receptacle for receiving the supply of rivet members. The hopper is also provided with a flange 12 to which the base 13 is adapted to be secured by means of bolts 14. The base 13 takes the general contour as shown in Figure 1 and is adapted to have a plurality of diagonally deflecting members 15 secured thereto for deflecting dust and loose particles away from the mechanism of the turning device. Also the rivets may jam in the hopper at the mouth of the chute in which case they are ejected

past the spring finger 16 and so are deflected by member 15 to a receptacle located in position to receive them.

Also secured to the base 13 is a chute designated in its entirety by 17, which comprises a plate 18 having secured in parallel relation side flanges 19, held in place by screws 20, which flanges have an undercut shoulder 21 providing a channel or guideway for the passage of the rivet member designated "X". At the lower end of the base 13 the chute 17 is continued and serves to deposit the work pieces, after they have passed through the turning mechanism, to the working tool of the riveting press.

The turning mechanism comprises a plurality of rotating wheels, one a left hand wheel 22 and the other a right hand wheel 23, both wheels having a knurled periphery and adapted to rotate in a clockwise direction as shown by the respective arrows in Figure 1. The wheel 22 is loosely mounted on the shaft 24 and is adapted to have located on either side thereof, a fiber washer 25 also loosely mounted on the shaft, and a metal washer 26 keyed to the shaft and located over the fiber washer. The upper fiber and metal washer are resiliently pressed by a spring 27, located on the shaft 24, which spring is held in place by lock nuts 28. On the other end of the shaft 24 a pinion 30 is keyed and held in place by securing nut 31.

Referring to the knurled wheel 23, it is to be noted that this wheel is so mounted as to have a rotary movement and in addition a reciprocating movement in a direction at right angles to the chute or guideway 17. For this purpose the wheel is directly keyed to shaft 32 and held in place on the shaft by lock nut 33. On the other end of the shaft a pinion 34 is keyed and held in place by lock nut 35 in a manner similar to the pinion 30 on shaft 24. The shaft 32 is journaled within a block 36, which is mounted in the base 13 in a manner allowing reciprocating movement by means of longitudinally extending keys 37. The block 36 is provided with a plurality of seats 38 for the reception of springs 40, which springs are backed by means of a backing plate 41 secured to the base 13 by means of bolts 42. A positioning screw 43 serves to accurately position the block 36 within the base so that the desired space can be secured between the stationarily mounted wheel 22 and the wheel 23. By reason of the springs 40 it is clearly seen that the block 36 and the wheel 23 mounted therein are spring pressed in a direction at right angles to the chute 17 and are adapted to be forced away from the guide 17 during the turning operations imparted to the work piece or rivet designated "X".

For rotating the wheels 22 and 23 in their respective directions the base 13 is provided with a bearing 45, within which is journaled a drive shaft 46 having mounted on its outer end a pulley 47 adapted to be driven by means of a belt 48. On the inner end of the drive shaft a bevel gear 50 is keyed or otherwise secured, which gear has meshing engagement with a similar bevel gear 51 mounted on the vertical shaft 52 depending from the base 13. Integral with the gear 51 is a pinion 53 having meshing engagement with the pinion 30 keyed to shaft 24.

For transmitting the desired rotations from pinion 53 to the wheel 23 an intermediate pinion 54 is provided, loosely mounted on stud 55, which depends from the base 13. The intermediate pinion 54 has meshing engagement with a pinion 56, also loosely mounted on stud 57 depending from base 13, the pinion 56 being located by means of proper location of stud 57 so as to have meshing engagement with the pinion 34 on shaft 32. In operation of the device the drive shaft 46 is driven through means of the belt 48 directly from the operating parts of the riveting press. The rotations thus imparted to the drive shaft are transmitted by means of the various pinions described, to the vertical shafts 24 and 32 respectively, and thus to the left hand wheel 22 and to the right hand wheel 23.

As the rivet members leave the hopper 10 and slide down the guideway 17, they engage the knurled edges of the rotating wheels 22 and 23 only when they have their flat sides facing in the wrong direction. The wheel rotates so that the rivet is rotated in a counter clockwise direction and this rotation will continue until its flat side will face the wheel 23. In this position the rivet is able to pass the wheels and so continue its travel along the guideway 17. The space between the wheels 22 and 23 can be adjusted so as to accommodate variations in the size of the rivet or variations in the amount of metal that was cut off to form their flat side previous to loading them in the receptacle. This adjustment is made by the screw 43 which positions the block 36 in the base 13. It is to be noted here that, as the rivet is turned so as to locate its flat side facing towards the right, that the wheel 23 being spring pressed in a direction at right angles to the guideway at 17 will yield to a slight extent to accommodate the enlarged diameter of the rivet. However the rivet will not be able to pass the wheels except when its flat side has been positioned towards the right.

Another feature of the present invention is the friction drive employed to impart the rotary movements to the wheel 22. By reason of the fiber washers 25 engaging the wheel and the metal washers 26, which are keyed to the shaft, the wheel is only frictionally driven and may have a certain amount of slippage on shaft 24. This is necessary as sometimes during the operation of the device

the rivets become jammed during their rotation. This amounts to a safety feature and allows more efficient operation of the device and consequently the rivet press associated therewith. A flexible blade 59 is secured to one of the side flanges 19 so as to prevent the rivets from lodging against the right side of the chute and thus jamming or clogging same. The blade is flexible so that it follows the wheel 23 in its reciprocations away from the chute and is thus in contact with the wheel at all times when the same is in its left hand position.

In Figure 5 a modified form of drive for the wheel 22 and 23 is employed. The pinions are omitted and in their place the shafts 24 and 32 have keyed to them pulleys 130 and 134 respectively. Also the intermediate pinion 54 is omitted and is replaced by an idler pulley 154. The pulleys employ an endless belt 160 which operatively connects the various pulleys with each other. Power is applied to the shaft 24 in any convenient manner such as by means of a bevel gear and a pinion as disclosed in the modification of Figure 1, which gears are adapted to be driven from drive shaft 46. It is noted that the endless belt 160 will impart clockwise rotation to both wheels in much the same manner as was secured by reason of the series of intermediate pinions previously described.

In Figures 7 to 9 inclusively still another modified form of connecting mechanism for the rotary wheels is disclosed wherein the pinions 30 and 34 secured to the shaft 24 and 32 respectively are retained. However, the intermediate pinions are replaced by single gear wheel 254 which is adapted to have meshing engagement with both the pinions 30 and 34. This construction is sometimes desirable as it makes for a simplified device allowing the omission of several pinions and their journaling studs.

It was explained in the operation of the device that as the rivets are rotated the wheel 23 is given a slight movement away from the guideway 17 by reason of the enlarged diameter of the rivet. This movement of the wheel 23 towards and away from the guideway serves to bring out of meshing engagement the pinion 34 and the large gear wheel 254, which to a certain extent will in time damage the teeth on the various wheels. To relieve this objection to the use of a single large gear wheel, the drive mechanism in Figure 8 is provided with a plurality of connecting links, the links 170 connecting the pinion 30 with the large gear wheel, while the link 171 serves to connect the gear wheel to the other pinion 34. The shaft 24 is of course mounted stationarily in the base 13 and as the shaft 32 is given reciprocating movements, the pinions and the gear wheel are held in meshing engagement by reason of the connecting links. The journaling of the gear wheel 254 is accomplished by employing a stud 172 with which the various links are operatively associated.

It is to be understood that we do not wish to be limited by the exact embodiment of the device shown, which is merely by way of illustration and not limitation, as various and other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

We claim:

1. In an article positioning mechanism of the class described, the combination with means for directing articles in a definite path, of rotatable wheels positioned on respective sides of said path, one of said wheels being frictionally driven, said wheels being so spaced as to prevent passage of an article except when aligned in a particular direction.

2. In an article positioning mechanism of the class described, the combination with means for directing articles in a definite path, of knurled wheels positioned on both sides of the path, means for mounting said wheels, one of said means being stationary in relation to the path, the other of said means being adapted for reciprocating movements towards and away from the path, and pinions secured to said mounting means, and a drive shaft for imparting rotary movement to said pinions.

3. In an article positioning mechanism of the class described, the combination with means for directing articles in a definite path, of rotatable wheels positioned on respective sides of said path, said wheels having a roughened periphery and so spaced as to prevent passage of an article except when aligned in a particular direction, one of said wheels being frictionally driven, and the other being positively driven.

4. In a turning device for flat-sided rivets, the combination with means for directing rivets in a definite path, rotatable wheels positioned on both sides of said path, said wheels being so positioned as to form a restricted passageway in said path, one of said wheels being stationarily mounted, and the other wheel being mounted for movement towards and away from the path.

5. In a turning device for flat-sided rivets, the combination with means for directing rivets in a definite path, a base secured to said means, shafts rotatably mounted in said base and positioned on opposite sides of said path, a knurled wheel frictionally secured to one shaft, and a second knurled wheel keyed to the other shaft.

6. In a turning device for flat-sided rivets, the combination with a chute for directing rivets in a definite path, a base secured to said chute, a shaft rotatably mounted in said base on one side of the chute, a slot formed in said base on the other side of the chute, a

block slidably mounted in said slot, a second shaft rotatably mounted in said block, and resilient means forcing said block towards the first mentioned shaft.

7. In a turning device for flat-sided rivets, the combination with a chute for directing rivets in a definite path, a base secured to said chute, a shaft rotatably mounted in said base on one side of the chute, a slot formed in said base on the other side of the chute, a block slidably mounted in said slot, a second shaft rotatably mounted in said block, a knurled wheel frictionally secured to said first mentioned shaft, a second knurled wheel keyed to the last mentioned shaft, and resilient means forcing said block towards the first mentioned shaft to form a restricted passageway in the chute.

8. In an article positioning mechanism of the class described, the combination with means for directing articles in a definite path, of wheels positioned on both sides of the path, means for mounting said wheels, one of said means being stationary in relation to the path, the other of said means having movement toward and away from the path, and a resilient strip forming a portion of one wall of the path below the wheels, the free end of the strip resiliently engaging the periphery of the movably mounted wheel to prevent clogging of the articles.

Signed at Chicago, Illinois, this 18th day of March, 1930.

FREDERICK M. LITTELL.
EDGAR R. MILLER.