No. 641,041. Patented Jan. 9, 1900.

V. ROYLE.

MACHINE FOR MANUFACTURING TUBING.

(Application filed Dec. 1, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2.

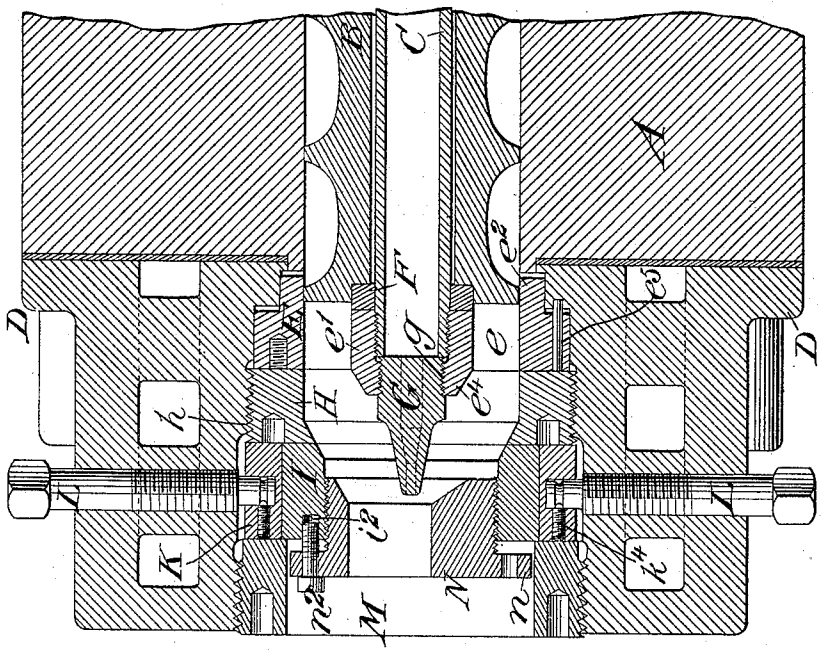
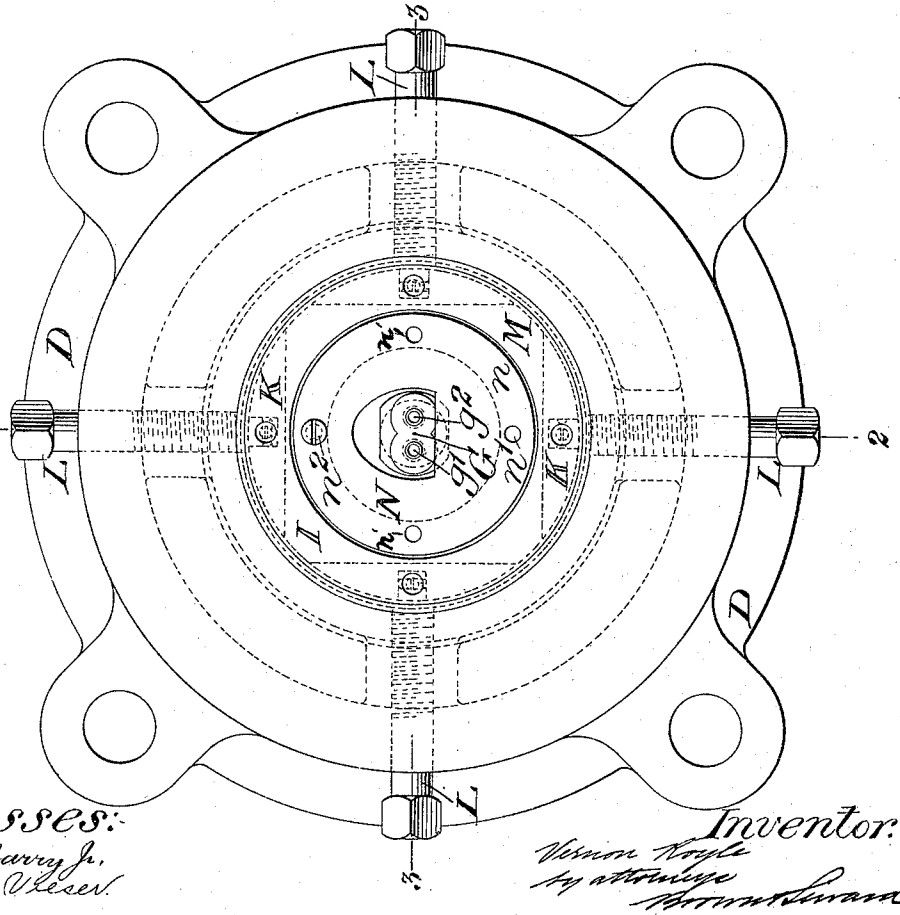


Fig. 1.



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Fig. 5.

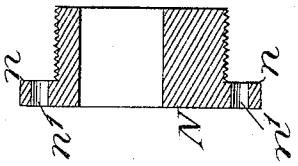


Fig. 8. Fig. 9.

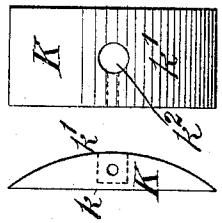


Fig. 7.

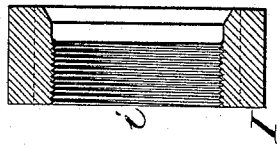


Fig. 4.

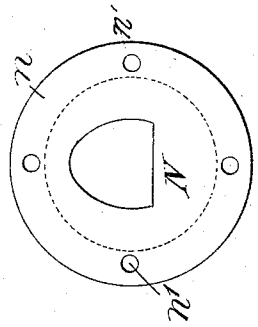


Fig. 6.

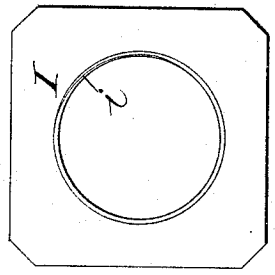
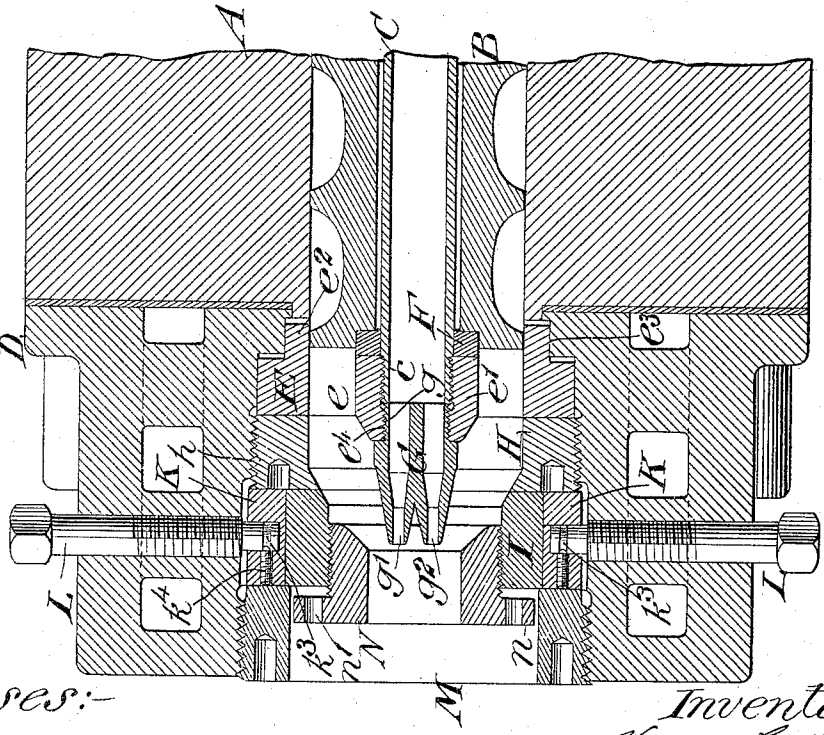


Fig. 3.



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UNITED STATES PATENT OFFICE.

VERNON ROYLE, OF PATERSON, NEW JERSEY.

MACHINE FOR MANUFACTURING TUBING.

SPECIFICATION forming part of Letters Patent No. 641,041, dated January 9, 1900.

Application filed December 1, 1897. Serial No. 660,366. (No model.)

To all whom it may concern:

Be it known that I, VERNON ROYLE, of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Machines for Manufacturing Tubing, of which the following is a specification.

My invention relates to an improvement in machines for manufacturing tubing in which the material for forming the wall of the tube is forced in a plastic state around a core and through a die.

The particular structure which I have chosen to illustrate a practical embodiment of my invention is adapted to the manufacture of tires—such, for example, as cushion-tires for vehicles, in which the tire is provided with a flat side to rest against the felly of the wheel and with one or more annular perforations for the reception of retaining-wires. I do not, however, wish to limit myself to this particular use of the machine, as it is capable of a more extended use by changing the form of the die and core to suit the demands.

As my present invention is confined to the structure of the machine at the discharge end, I have shown only so much of a complete machine as is necessary to fully illustrate the structure and arrangement of the improved parts.

In the accompanying drawings, Figure 1 is an end view looking toward the discharge end. Fig. 2 is a vertical central section in the plane of the line 2 2 of Fig. 1. Fig. 3 is a horizontal section in the plane of the line 3 3 of Fig. 1. Fig. 4 is an end view of the die in detail. Fig. 5 is a sectional view of the same from front to rear. Fig. 6 is an end view in detail of the die-holder. Fig. 7 is a sectional view of the same from front to rear; and Figs. 8 and 9 represent, respectively in end and side elevation, one of the several shoes for holding the die-holder in its lateral adjustment with respect to the core.

The barrel of the machine, in which the plodder works, is denoted by A, the plodder by B, and the central tube, about which the plodder rotates within the barrel, by C. The mechanism for rotating the plodder is not shown herein and may be of any well-known or approved form.

At the end of the barrel A there is located a chambered cap D for the reception within it of a die-holder and core-bridge, together with the parts which coact therewith.

The core-bridge is denoted by E. It is provided with radial webs e, connecting its annular rim with a central hub e', and its forward end is reduced, as shown at e^2, to fit a reduced bore e^3 at the end of the cap D adjacent to the barrel A. The reduced portion e^2 of the core-bridge is unobstructed by the radial webs e for a considerable distance from its end and receives within it the rear end of the plodder B. A tight joint is formed between the end of the plodder and the hub e' of the core-bridge by means of an annular gasket or washer F, which fits tightly the central tube C, the end of the hub e' of the core-bridge, and the recess in the end of the plodder.

The central tube C is projected rearwardly beyond the rear end of the plodder B, as shown at c, and is provided with an exterior screw-thread adapted to register with an internal screw-thread on the hub e' of the core-bridge. The hub e' is extended rearwardly with a slightly-reduced bore, as shown at e^4, and is screw-threaded for the reception of the screw-threaded end g of the core G. The core G is here represented as provided with a plurality of nozzles, (denoted by g' g^2,) the interior openings in which lead to the common interior opening of the central tube C.

In assembling the parts the core-bridge, either before or after the core G has been engaged therewith, is screwed onto the projecting end c of the central tube C, and when in position is locked against a rotary movement by means of a dowel-pin e^5, (see Fig. 2,) inserted through its rim into the wall of the cap D. The core-bridge is locked in its position against displacement in a longitudinal direction by a hollow nut H, which engages an interior screw-thread h on the inner wall of the cap D.

To the rear of the nut H the die-holder I is located and is permitted a limited transverse movement within the cap D. The die-holder I is provided with a polygonal periphery—in the present instance in the form of a square, with its corners clipped—and in engagement with each side of the square periphery of the die-holder there is a shoe K. The shoe K is

in the form of a segment of a cylinder, and its flat side k is adapted to rest in engagement with the side of the die-holder.

The curved side k' of the shoe is made of an arch corresponding to the circular interior of the cap D, and in this convex side of the shoe there is formed a socket k^2 for the reception of the inner end of an adjusting-screw L, having a screw-threaded engagement with the wall of the cap D. The end of the screw L within the shoe K is provided with an annular groove k^3, within which the point of a headless screw k^4 is received, the said screw k^4 having a threaded engagement with the body of the shoe K. By this means the adjusting-screws L have a swiveled engagement with the shoes K and when turned in or out force the shoes toward and away from the die-holder to permit it to be adjusted laterally with respect to the core, so that the core may have its effect upon the completed tubular structure centrally or eccentric with respect to the axis of the tubular structure. The arrangement for holding the die-holder between the opposite pairs of shoes also admits of sliding it into and out of its position with respect to the core by simply loosening the grip of the shoes on its sides. The die-holder is held in position against displacement in the longitudinal direction of the machine by means of an annular nut M, having a screw-threaded engagement with the interior of the cap D.

The die is denoted by N. It is provided with an annular flange n, provided at intervals with perforations n'—in the present instance a quadrant's distance apart—through which an adjusting-screw n^2 (see Fig. 1) may be inserted to hold the die in the desired rotary adjustment. The body of the die N is exteriorly screw-threaded to engage a corresponding thread i in the interior circular wall of the holder i, and by its threaded engagement with the holder it may be adjusted longitudinally toward and away from the core G, as may be desired. I have provided for adjusting it longitudinally a distance corresponding to a fractional part of the width of one of the screw-threads by simply rotating it from its position with one of the holes n' in position to register with the screw-threaded socket i^2 in the holder (see Fig. 2) to a position in which a succeeding hole n' will register with the same socket i^2. In the present instance, with the holes n' n' a quadrant's distance apart, it may be given a quarter-turn and moved a distance in a longitudinal direction equal to one-quarter of the width of a screw-thread, or it may be given a half-turn, a three-quarter turn, or a full turn to move it a greater distance, if desired.

Where the die is arranged to form a tubular structure having a flat side, as in the present instance, and the core remains stationary, it is essential that the die shall maintain the same relation to the core in order that the annular openings for the fastening-wires in the structure shall be located in the proper position with respect to the flat side of the structure. To provide for this and at the same time change the die with respect to the core by a fractional turn, it requires simply that the die after being turned within the holder to a position in the proper longitudinal adjustment with respect to the core shall be fastened to the holder in its adjustment and the holder then bodily removed from between the adjusting-shoes and turned into a position which will bring the flat side of the die into the proper relation to the core and then slid back again into its position for use.

In order to adjust the core G to the correct position with respect to the die, either originally or when it may have become displaced from wear, the core G may first be screwed into position into the hub of the bridge-piece, and while held in position the tube C may be given one or more turns or fraction of a turn to jam its rear end against the end of the core, and thereby lock it in position.

It is obvious that slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. The combination with a die, of means for moving it bodily in a lateral direction and means for holding the die against rotation during its lateral movement, substantially as set forth.

2. The combination with a die and a core, of means for adjusting the die laterally without varying its longitudinal position with respect to the core and means for holding the die against rotation during its lateral movement, substantially as set forth.

3. The combination with a die, of a die-holder having a polygonal periphery and means for holding the die-holder in position, substantially as set forth.

4. The combination with a die, of a die-holder having substantially two opposite sides parallel, substantially as set forth.

5. The combination with the die and its holder, of adjusting-screws and shoes interposed between the adjusting-screws and die-holder, substantially as set forth.

6. The combination with the die-holder, of the die having a rotary engagement therewith and a screw for holding the die in different rotary adjustment with respect to the holder, substantially as set forth.

7. The combination with the core and a die for coacting with the core, of a die-holder within which the die has a rotary movement and means for adjusting the die longitudinally toward and away from the core and means for locking the die in different adjustments corresponding to a fractional turn of the die, substantially as set forth.

8. The combination with the polygonal-shaped die-holder and the die having a screw-

threaded engagement with the holder, of means for holding the die in different rotary positions within the holder corresponding to the sides of the die-holder, substantially as set forth.

9. The combination with the core-bridge, core, die and plodder the core-bridge being free to slide directly toward and away from the plodder, of a dowel for preventing the turning of the core-bridge, substantially as set forth.

10. The combination with the core-bridge and its support the core-bridge being free to slide directly toward and away from its seat, of an annular nut for holding the core-bridge against its seat, substantially as set forth.

11. The combination with the core-bridge and the annular nut for securing it against its seat of the adjustable die and means for adjusting it laterally and longitudinally, substantially as set forth.

12. The combination with the plodder, the central tube having a screw-threaded extension at its rear end and the core, of the bridge-piece having its hub interiorly screw-threaded for the reception of the ends of the central tube and the core, substantially as set forth.

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C. S. SUNDGREN.