W. R. EDWARDS AND J. LUKES.

MACHINE FOR SIZING AND PUNCHING RIMS AND BANDS.

APPLICATION FILED AUG. 16, 1919.

1,419,619.

Patented June 13, 1922.

3 SHEETS—SHEET 1.

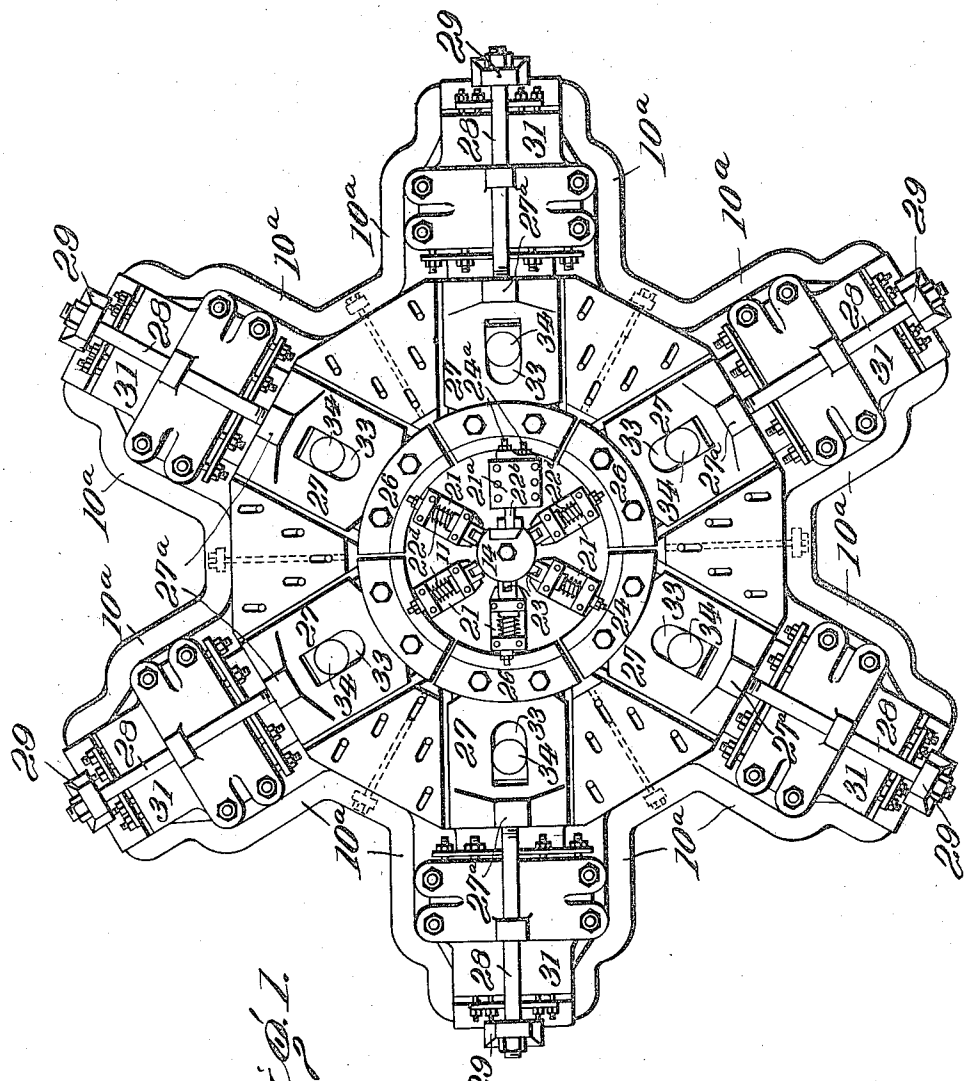


Fig. 1.

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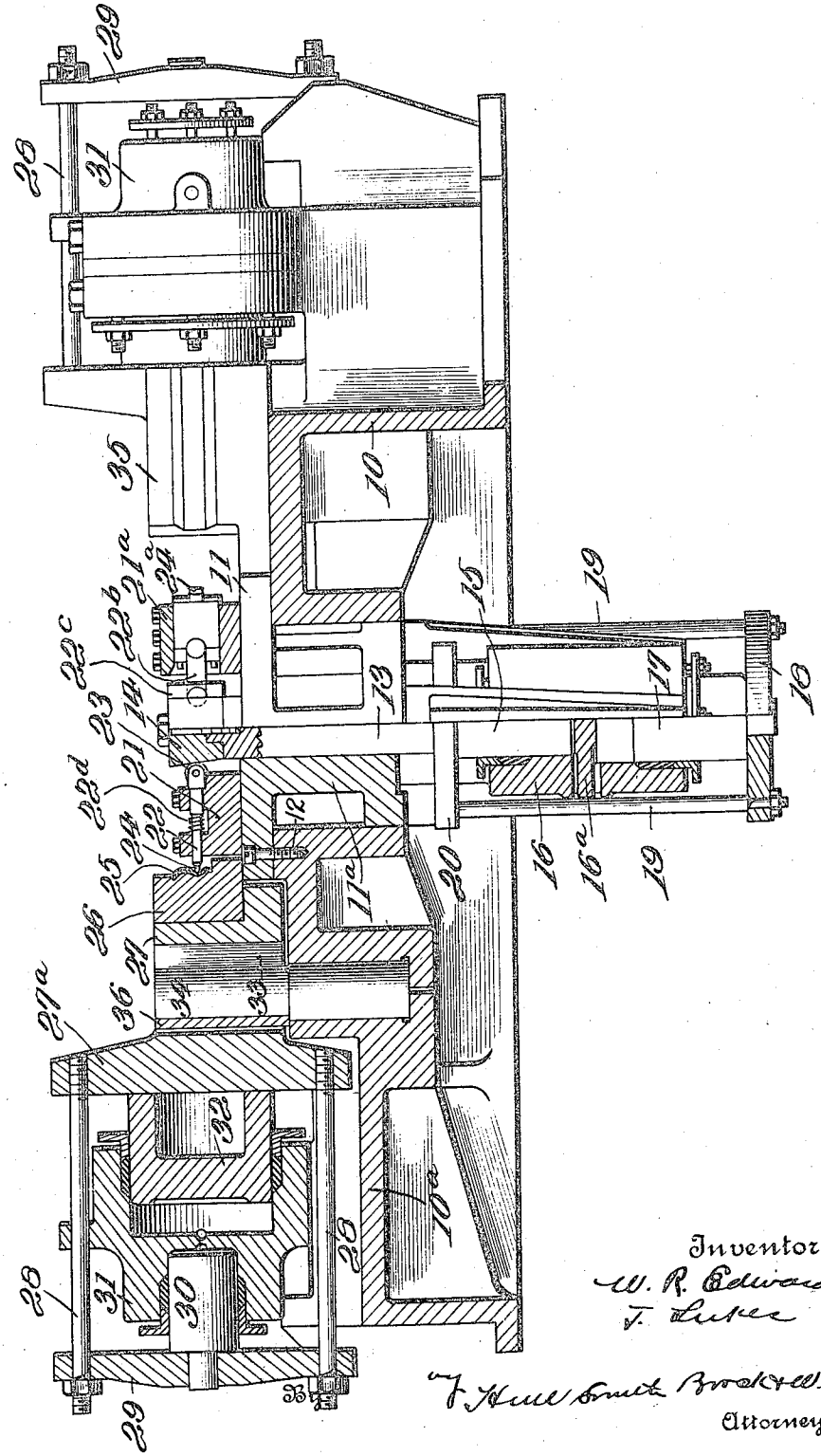
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3 SHEETS—SHEET 2.

Fig. 2.



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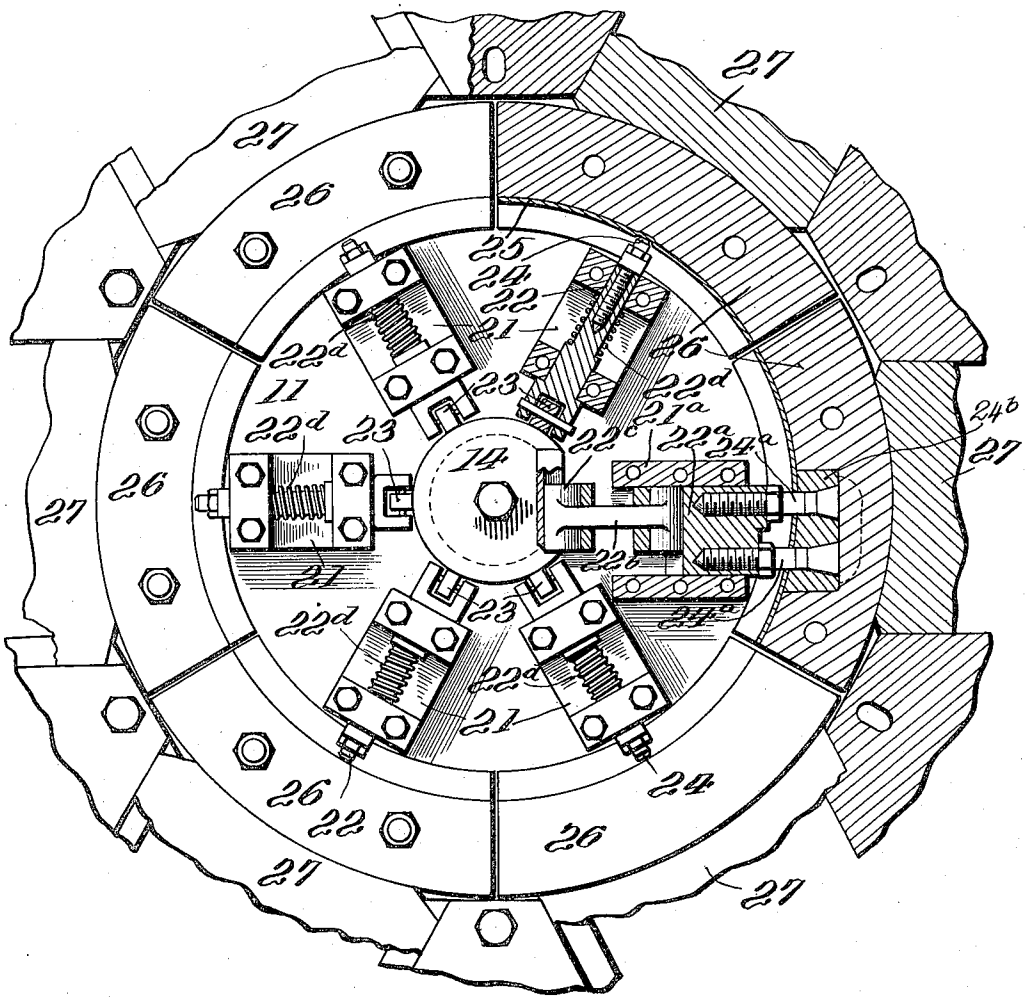


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SIZING AND PUNCHING RIMS AND BANDS.

1,419,619. Specification of Letters Patent. Patented June 13, 1922.

Application filed August 16, 1919. Serial No. 318,066.

To all whom it may concern:

Be it known that we, WILLIAM R. EDWARDS and JOHN LUKES, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Machines for Sizing and Punching Rims and Bands, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention is a machine for sizing, cupping and punching bands or rims which are intended to be used upon automobile wheels.

Automobile wheels as usually constructed have a metallic felly band provided with at least two openings, one to receive the valve stem and the other driving lug attached to the demountable tire carrying rim; and these felly bands are also provided with a plurality of outwardly extending projections or protuberances which serve as spacing buttons against which the rim is drawn when fastened upon the wheel body.

In the manufacture of these felly bands, a flat strip of metal is first rolled into circular form and the ends welded together and then a flange is rolled thereon at one or both edges, and then, after the felly band has been thus far manufactured, it has been customary to punch them, cup them, and size them by means of separate or independent operations.

This invention has for its object to provide a machine which will simultaneously perform these various operations on the felly band thereby materially reducing the cost of manufacture of said band. It will be understood however that the features of construction and combination can be utilized for the performance of similar operations upon bands or rings other than felly bands.

The invention consists in the novel features of construction and arrangement all of which will be hereinafter more fully described and set forth in the appended claims.

In the drawings forming a part of this specification, Fig. 1 is a top plan view of a machine constructed in accordance with our invention; Fig. 2 is a vertical central section partly in elevation; and Fig. 3 is an enlarged plan view partly in section of the central portion of the machine.

In the practical embodiment of our invention we employ a base 10 having a circular opening at the center thereof and this base may be circular or hexagonal in shape and provided with six radial extensions 10^a, the purpose of which will appear hereinafter. Fitting into the central circular opening of the base is a bed plate 11 circular in shape and having a central depending portion 11^a which fits down into the central circular opening of the base, the bed plate being securely fastened by means of bolts 12, the heads of which are sunk below the surface of the bed plate. The bed plate is also formed with a central circular opening through which works the plunger 13 having an expanding head 14 connected to the upper end thereof, the plunger 13 having a piston 15 connected to the lower end thereof, which piston works in the upper end of a cylinder 16. This cylinder 16 also has a piston 17 working in the lower end thereof, the diameter of the piston 17 being somewhat larger than the diameter of the piston 15 so that an increased pressure can be placed thereon. The piston 17 is connected to a cross head or yoke 18 which in turn has rods 19 connected thereto, these rods being connected to an upper cross head or yoke 20 which bears upon the upper end of the piston 15 so that when pressure is applied to the piston 17 this piston will be forced down carrying with it the yokes which in turn will exert a pull upon the plunger 13 and draw the expanding or wedge shaped head 14 downwardly. Upon the reverse movement the piston 15 will be raised carrying with it the plunger 13 and head 14. The cylinder 16 is provided with ports 16^a for the introduction of fluid pressure which may be water or air as preferred. Fastened upon the bed plate 12 are a series of guide blocks 21, five in number, as shown in the drawings though any desired number can be employed, and working in each one of these guide blocks is a cupping punch 22 carrying a roll 23 at the inner end adapted to engage the head 14 while the cupping tool 24 carried at the outer end is adapted to engage the inner face of the felly band 25, resting upon the shrinking blocks 26, there being six such blocks, each block being a section or sector of a circle and which rest upon the outer edges of the bed plate,

and also upon the inner shouldered faces of the slides 27, there being six such slides operated in the manner hereinafter described.

In addition to the five guide blocks 21 there is a sixth guide block 21^a in which slides a block 22^a carrying the punching tools 24^a, the opposite shrinking block 26 having a suitable die 24^b inserted in the face thereof to cooperate with the punching tools 24^a. The slide 22^a is connected by a toggle arm 22^b to the head 14 by means of a cap piece 22^c, and from this construction it will be readily understood that as the expanding head moves down to force the cupping punches outwardly, the punching tools will be forced outwardly by means of the toggle arm and the holes punched in the felly band at the proper points. When the head 14 moves upwardly, the punching tool is drawn inwardly and the coil springs 22^d withdraw the cupping punches from the band or rim.

The slide blocks 27 slide in grooved ways cut in the base and at their outer ends are provided with vertical extensions 27^a to which are connected rods 28 which in turn are connected to a yoke or cross head 29 which is actuated by a piston 30 working in the outer end of the cylinder 31, there being a piston 32 working in the inner end of said cylinder which piston is of greater diameter than the piston 30 and contacts with the outer face of the slide 27. Each slide 27 is provided with a longitudinally elongated opening 33 through which extends a stop post 34 fastened rigidly in the base and projecting upwardly into the slide and serving as a stop member to arrest the radial inward movement of the slide and also the radial outward movement. The inner edge of the slide 27 being shouldered serves to receive and support a portion of the shrinking block 26, the extreme inner portion of said circular block resting upon the bed plate as clearly shown and previously described.

It will be understood that there are six cylinders 31 and the corresponding number of slides and posts and the extensions 10^a of the base are provided to receive the cylinders 31 and parts connected thereto. The slides 27 are guided laterally upon suitable gibs 35. The guide blocks 21 and 21^a can of course be changed or adjusted in their positions to suit various sizes of bands or different characters of work to be accomplished and the circular bed plate 11 with attached parts can be removed when desired after removing the bolts 12. The shrinking blocks 26 can be quickly and easily removed and different ones substituted to accommodate different sizes and shapes of bands.

Between the post 34 and the outer end of the opening 33 there is inserted a shim plate 36 which is in the nature of a gauge and which may be varied as desired in order to properly limit and stop the movement of the slide at the exact point and, by the employment of shim plates of varying degrees of thickness, the exact amount of travel can be imparted to the slides.

In operation, the expanding head is first raised and the slides are spread so as to permit the felly band to be freely placed within and upon the shrinking blocks. Pressure is then introduced into the cylinders 31 by forcing the pistons 32 inwardly, which pistons operate upon the slides and communicate their movement to the shrinking blocks 26 which impart the proper size and shape to the felly band, and while the band is thus held in its proper shaped and sized position, the expanding head 14 is forced downwardly by applying pressure to the piston 17, the expanding head acting upon the cupping punches 22 and at the same time upon the punching tools 24^a thereby simultaneously providing the protuberances or buttons upon the outer face of the felly band and punching the valve stem hole and driving lug hole at the proper points.

The movements of the machine are then reversed and the band properly sized and punched is quickly and easily removed and a new one inserted, and the operation is repeated.

It will thus be seen that we provide a machine which will, at one operation, quickly and easily perform all the necessary operations to completely finish the felly band.

Having thus described our invention, what we claim is:—

1. In a machine of the kind described the combination with a plurality of radially inwardly movable sizing members and means for actuating the same, of a plurality of outwardly movable punches adapted to operate upon an article held within the sizing members and means for actuating said punches.

2. In a machine of the kind described the combination with a plurality of radially inwardly movable sizing members, means for actuating the same, of a plurality of outwardly movable punches adapted to operate upon an article held within said sizing members, together with means for actuating said punches subsequent to the operation of the sizing members.

3. In a machine of the kind described the combination with a base, of a centrally arranged bed plate, a plurality of outwardly movable punches arranged upon said bed plate, means for moving said punches and a plurality of inwardly movable sizing members arranged upon the base and adapted to compress a rim in advance of the action of the punches, together with means for moving said sizing members.

4. In a machine of the kind described the combination with a base, of a bed plate arranged centrally thereof, guide blocks ar-

ranged upon said bed plate, punches carried by said guide blocks, an expanding member movable axially through the bed plate and operable upon said punches, means for actuating said expanding member, and a plurality of sizing members adapted to receive an article thereon together with means for moving said sizing members radially inward.

5. In a machine of the kind described the combination with a base, of a bed plate arranged centrally thereof, guide blocks arranged upon said bed plate, cupping punches carried by said guide blocks, another guide block and a perforating punch carried thereby, an expanding member movable axially with reference to the bed plate and operable upon the cupping punches and perforating punches together with a plurality of radially movable sizing members with means for moving the same.

6. In a machine of the kind described the combination with a base and bed plate, of punches arranged upon said bed plate together with means for moving the same, of a plurality of sizing blocks, a plurality of slides for moving said sizing blocks together with means for moving said slides.

7. In a machine of the kind described the combination with a base, of a plurality of punches supported centrally upon said base together with an expanding member operable upon said punches, of a plurality of sizing members, slides for moving said sizing members, guides for said slides, means for actuating said slides together with means for limiting the inward radial movements of said slides.

8. In a machine of the kind described the combination with a base, of a bed plate arranged thereon, radially movable punches arranged upon said bed plate, an expanding member movable axially with reference to the bed plate and operable upon said punches, a plurality of sizing members, a slide for each sizing member, guides for each slide, means for moving each slide radially together with means for limiting the radial movement of each slide.

9. In a machine of the kind described, a base having a centrally disposed bed plate, a plurality of sizing blocks arranged upon the base and adapted to move inwardly to size a rim, and means for so moving said sizing members and a plurality of outwardly movable punches arranged upon the bed plate together with means for so moving said punches subsequent to the sizing operation of the sizing members.

In testimony whereof, we hereunto affix our signatures.

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JOHN LUKES.