G. S. HILTZ.

MANUFACTURE OF TYPE WHEELS.

APPLICATION FILED JULY 26, 1918.

1,371,680.

Patented Mar. 15, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

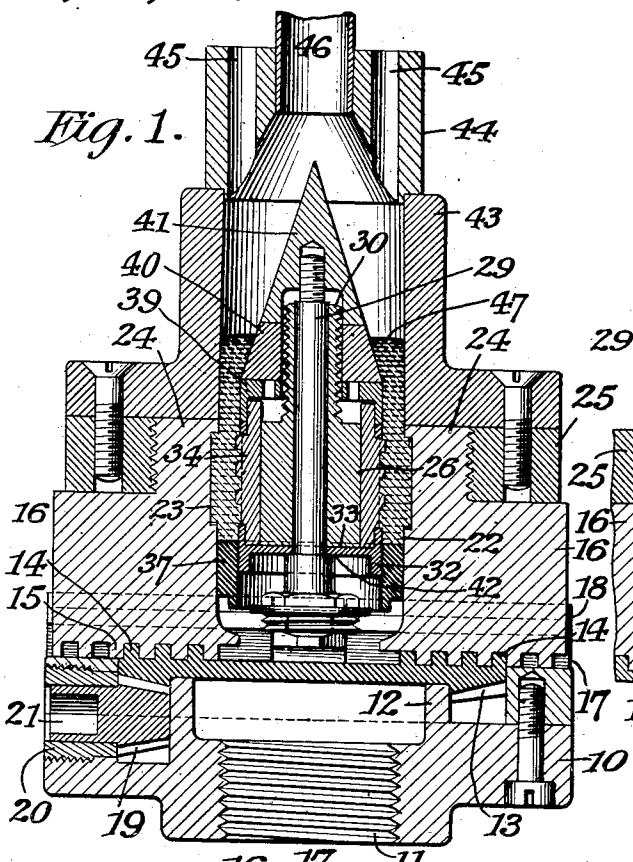


Fig. 2.

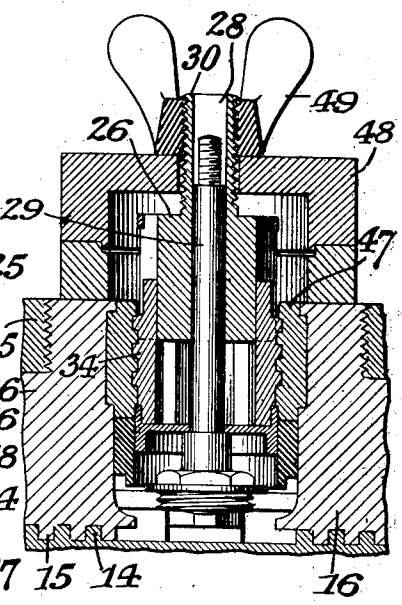


Fig. 3.

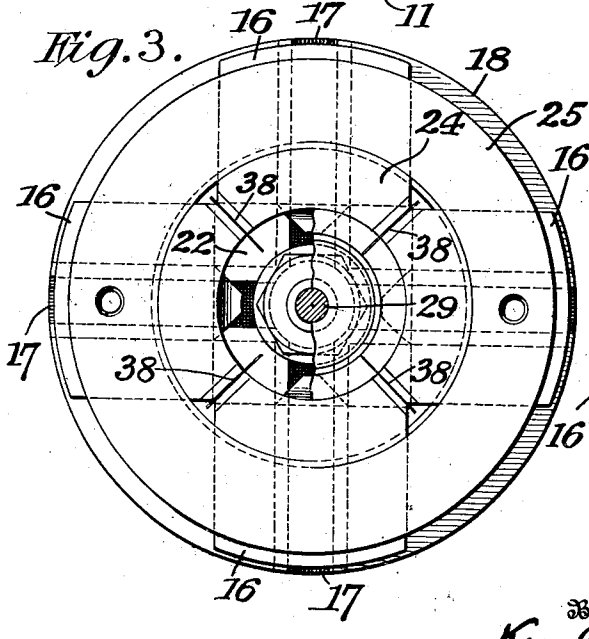
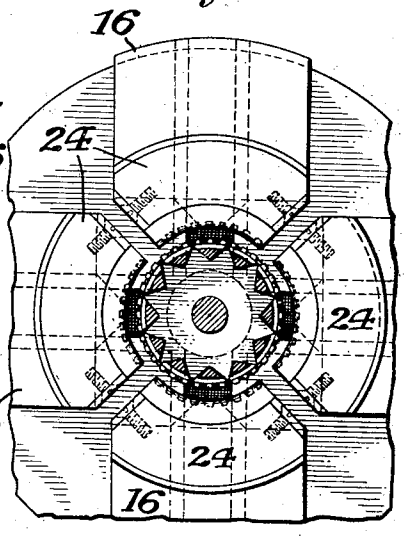


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

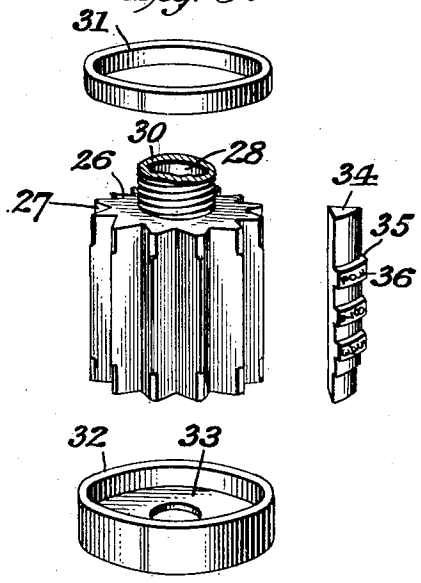


Fig. 6.

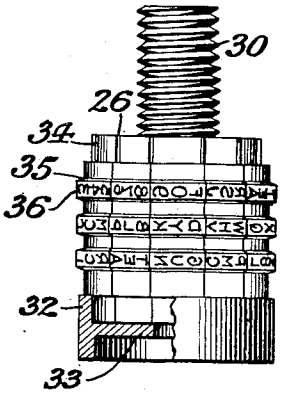


Fig. 8.

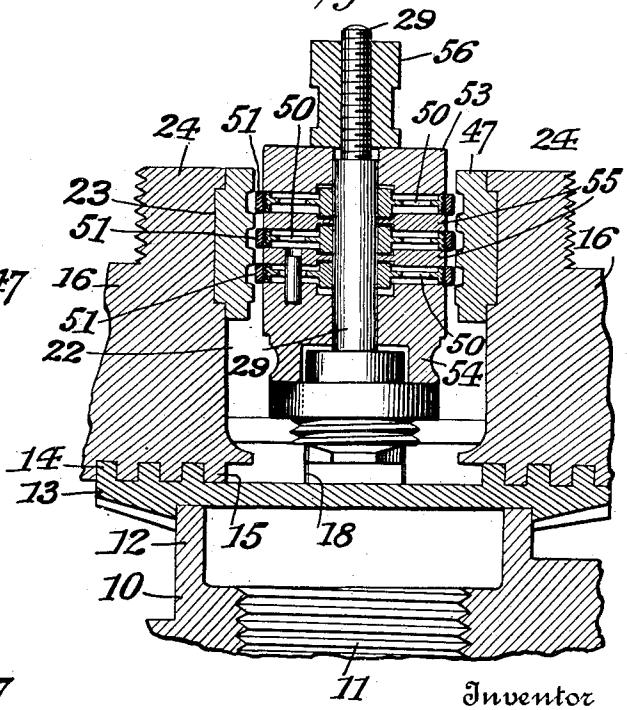


Fig. 7.

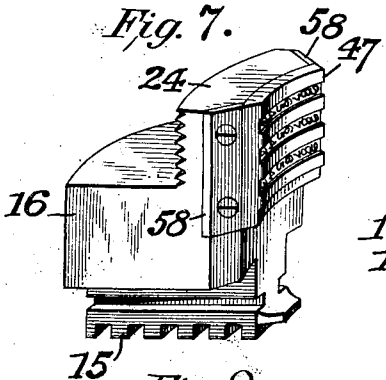


Fig. 9



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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF TYPE-WHEELS.

1,371,680. Specification of Letters Patent. Patented Mar. 15, 1921.

Application filed July 26, 1918. Serial No. 246,815.

To all whom it may concern:

Be it known that I, GEORGE S. HILTZ, a citizen of the United States, residing at New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Manufacture of Type-Wheels, of which the following is a full, clear, and exact description.

This invention relates to the art of casting plastic material upon the edge of a disk or plate, and pertains more particularly to the manufacture of type-wheels for use in typewriters, time-recorders, printing telegraph "tickers" or receivers, and the like. In such machines the type wheel usually consists of a metal wheel or disk having soft rubber type on its periphery. The chief object of my invention is to provide simple and effective apparatus which can be used not only to cast the type upon the periphery of the disk or wheel but which can also be used for making the matrix in which the type are subsequently cast. To this and other ends the invention consists in the novel features of construction and combinations of elements hereinafter described.

One form of the invention is illustrated in the accompanying drawings, in which:

Figure 1 is a vertical section of the apparatus, showing the first stage in the making of the matrix.

Fig. 2 is a detail vertical section showing a later stage in the making of the matrix.

Fig. 3 is a plan view, with certain parts shown in Fig. 1 omitted.

Fig. 4 is a sectional plan view, with certain parts shown in Fig. 3 omitted.

Fig. 5 is a perspective view showing the core (with the parts thereof separated) used in making the matrix.

Fig. 6 is a side view, partly in section, showing the complete core and die for making the matrix.

Fig. 7 is a perspective view of one of the radially adjustable matrix-carriers.

Fig. 8 is a detail sectional view of the apparatus showing the first stage in the casting of the soft rubber type on the peripheries of a plurality of type-wheels.

Fig. 9 is a perspective view of one of the completed typewheels.

The base 10, Fig. 1, is in the form of a disk having a central internally threaded aperture 11 (by which the apparatus can be mounted on the spindle of a lathe for the purpose explained hereinafter) and having on its upper side a circumferential flange 12 concentric with the aforesaid opening. This flange supports a bevel gear 13 the teeth of which project downwardly outside of the flange. The upper face of the gear is provided with a spiral thread 14 to coöperate with the concentric circular threads 15 on the under side of the matrix-carriers 16. The latter are mounted to move radially in radial T-slots 17 in a disk-shaped carrier 18 securely fixed on the base 10 concentrically with the aperture 11. To rotate the bevel gear 13, thereby adjusting the matrix-carriers inwardly or outwardly as desired, like the jaws of a lathe chuck, a bevel pinion 19 is provided, meshing with the bevel gear and journaled in a bearing 20 removably mounted in one side of the base 10. The journal of the pinion is provided with a square socket 21 to receive an operating key or crank not shown.

The radially adjustable matrix-carriers 16 have their inner faces cylindro-concave in form, so that when they are in their innermost position they will form an upwardly open cylindrical chamber 22 co-axial with the base 10. The inner faces of the carriers are also provided with recesses 23, forming an annular recess when the carriers are in their inner positions. The bosses 24, forming the top of the carriers, are threaded to receive a binding ring 25 as hereinafter described.

The core, shown in Figs. 1 and 5, comprises an upright member 26, deeply grooved with V-shaped grooves 27 on its outside and having an axial bore 28 to receive a stem 29, Fig. 1. On the top of the core is a threaded neck 30. The core is star-shaped in cross section, and at top and bottom the points are cut away to receive rings 31, 32. The latter ring has an internal flange 33.

To prepare the matrix, the sector-shaped die-pieces 34, Figs. 5 and 6, are fitted into the grooves in the core 26, thereby making a cylinder of the same with one or more circumferential ribs 35 bearing type-dies 36. The rings 31, 32, are then fitted to the core, thereby holding the die-parts in place, the die-parts resting on the flange 33 of ring 32, as shown in Fig. 6. A sleeve or bushing 37, Fig. 1, is then fitted on the ring 32. This completes the die proper.

The die described is now slipped on the

stem 29 and the whole is then placed in the space bounded by the matrix-carriers 16, Fig. 1, with parting leaves or strips 38, Fig. 3, of very thin sheet metal between the carriers, said parting strips extending radially into contact with the die and having their inner edges notched to conform to the die-ribs 35. The matrix-carriers are now closed up, thereby gripping the spacing ring 37 and holding the die securely in the position shown in Fig. 1, after which a flanged disk 39 is placed on the die, followed by a frusto-conical washer 40 and then a conical nut 41 which serves to shed the molten metal in the operation of making the matrices. The latter is screwed down tightly on the stem 29, thereby pressing the die-parts 34 snugly upon the flange 33 of ring 32 which in turn bears on the shoulder 42 formed on the stem 29. The ring 25 is now screwed upon the matrix-carriers, and to this ring is fastened a flanged collar 43 upon which is removably seated a ring 44 having vent holes 45 and carrying a central tube 46 of considerable height.

Molten type-metal or other suitable metal in sufficient amount is now poured into the the tube 46. Falling from a considerable height the metal strikes the mold forcibly, thereby preventing the formation of "blow-holes" in the molten mass and driving the metal deeply into all parts of the mold. The latter is thus filled with metal 47, Fig. 1.

After the metal has solidified in the mold the cap 43 is removed and the device secured to a lathe spindle by means of the threaded socket 11. The excess metal is then turned off flush with the top of the matrix-carriers, as shown in Fig. 2. Following this operation the disk 39, washer 40, and nut 41 are removed, and a cap 48 is set down upon a spacer in turn placed upon the matrix-carriers, with the neck 30 projecting above the cap. By means of a wing nut 49, screwed upon the neck 30 and bearing on the top of the cap, the core 26 is withdrawn, as indicated in Fig. 2, leaving the die-parts 34 adhering to the matrix 47. The ring 25 is now taken off and the mold expanded by shifting the matrix-carriers outwardly, after which the die-members 34 and other parts of the die, together with the parting strips 38, are removed, leaving each matrix-carrier with a section of the matrix thereon as shown in Fig. 7.

To cast the rubber type on the type-wheels 50 the edges of the latter (circumferentially grooved or otherwise roughened to enable the rubber to take a firm grip) are covered with strips of prepared gum 51, Fig. 8, and are slipped down on the stem 29 between upper and lower clamping blocks 53, 54, the wheels being separated by disks 55 to space them apart in correspondence with the molds in the matrix. The nut 56 is now screwed down to clamp the parts tightly on the stem, and the whole is positioned in the matrix as shown in Fig. 8, after which the matrix-carriers 16 are moved inwardly, thereby bringing the type molds into engagement with the gum rings 51 and causing the latter to take the exact form of the molds. The ring 25, Fig. 1, is then replaced and the entire device subjected to vulcanizing temperature. When the vulcanization is completed the mold is opened and the type-wheels removed. Any excess rubber can be trimmed off, leaving the wheels with soft rubber type on their peripheries, as shown at 57, Fig. 9.

The matrix is of course capable of repeated use. When a new matrix is rendered necessary by wear or other injury the parts of the old matrix can easily be removed from the carriers. For this purpose it is only necessary to remove the screws that hold the side-plates 58, Fig. 7, in place. These plates overhang the ends of the cylindrical grooves 23, Fig. 1, and hence convert the latter into undercut recesses with which the backs of the matrix sections make a dove-tail interlock in the operation of casting the matrix. This construction also permits convenient substitution of matrices at any time, for casting other styles or kinds of type.

It is to be understood that the invention is not limited to the exact construction herein specifically described but can be embodied in other forms without departure from its spirit.

I claim:

1. In an apparatus for making typewheels, in combination, a base, a plurality of matrix-carriers mounted on the base and shiftable toward and from the axis thereof, a stem extending outwardly from the base at the axis thereof to support between the matrix-carriers a die, and means whereby matrices may be cast on said matrix-carriers simultaneously.

2. In an apparatus for making typewheels, in combination, a base, a plurality of matrix-carriers mounted on said base and shiftable toward and from the axis thereof, each of said carriers having a channel on its inner face, and means comprising a plurality of plates detachably secured to said carriers and coöperating with said channels to form dove-tail matrix-receiving recesses.

3. In an apparatus for making typewheels, in combination, a base adapted to be mounted on a lathe spindle, a plurality of matrix-carriers carried by the base and shiftable toward and from the axis thereof, a stem at the axis of the base and extending outwardly therefrom to support a die between the matrix-carriers, and means for delivering molten metal into the space inclosed by the matrix-carriers.

4. In an apparatus for making typewheels, in combination, a base, a plurality of matrix-carriers spaced equi-angularly around the axis of the base and movable toward and from the same, a stem between the matrix-carriers at the axis of the base to support a die, and a ring adapted to encircle the matrix-carriers when in their innermost position to lock the matrix-carriers in such position and provided with a collar concentric with the space bounded by the matrix-carriers.

5. In an apparatus for making typewheels, in combination, a base, a plurality of matrix-carriers spaced equiangularly around the axis of the base and movable toward and away from the same, means for shifting said carriers, and a ring adapted to encircle the carriers when in their innermost position to lock them in such position.

6. In an apparatus for making typewheels, in combination, a base, matrix-carrying means on said base for forming a substantially cylindrical recess, a stem extending through said recess at the axis thereof, a die comprising a body portion slidably mounted on said stem, and means adapted to engage said matrix-carrying means and said body portion for withdrawing the latter from said recess.

In testimony whereof I affix my signature.

GEORGE S. HILTZ.