Nov. 18, 1924. 1,515,743

W. H. MARKLAND

SURFACING MACHINE

Original Filed Jan. 19, 1922 2 Sheets-Sheet 1

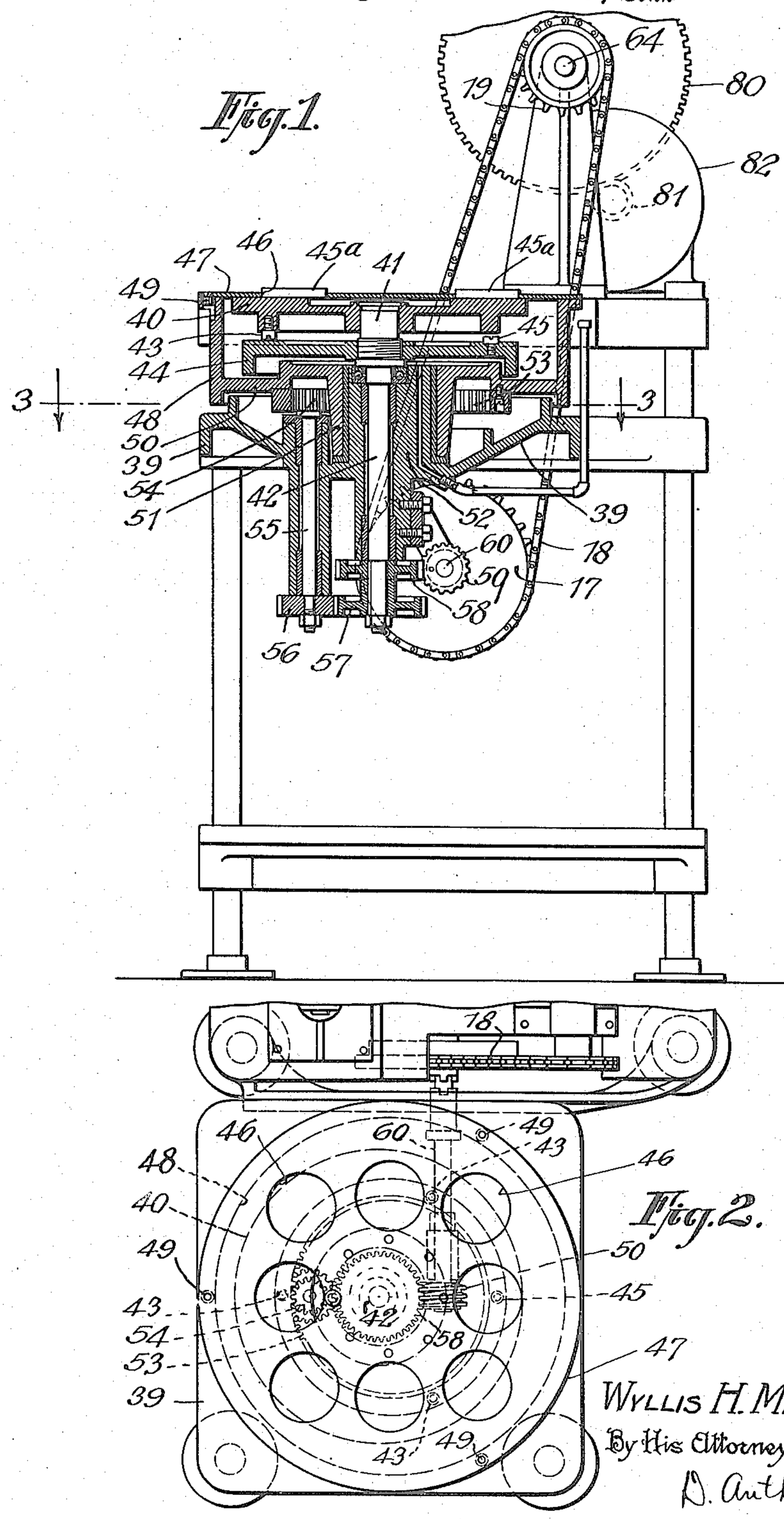

Fig. 1.

Fig. 2.

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Fig. 3.

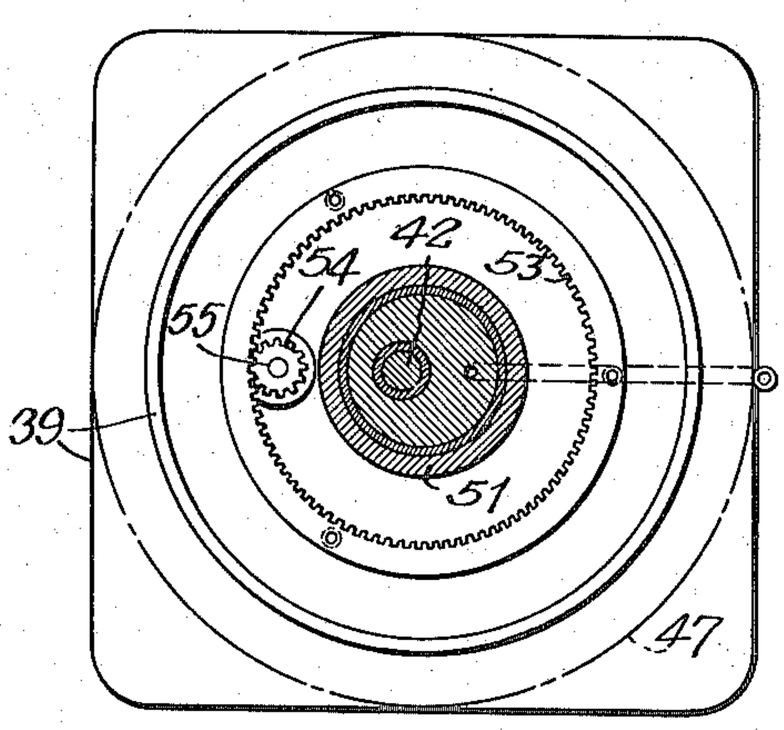


Fig. 4.

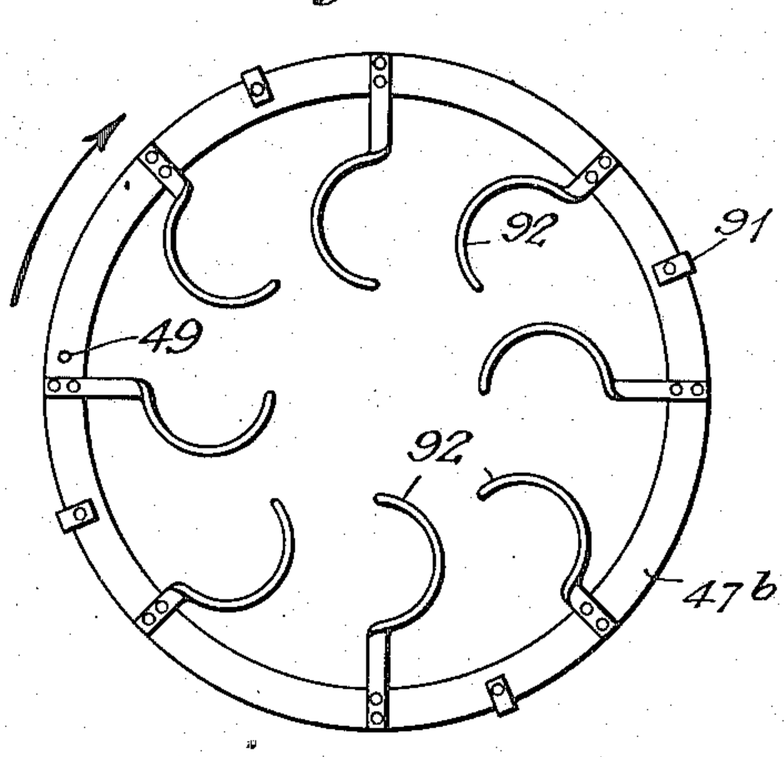


Fig. 5.

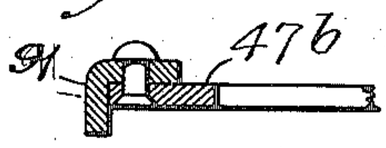


Fig. 6.

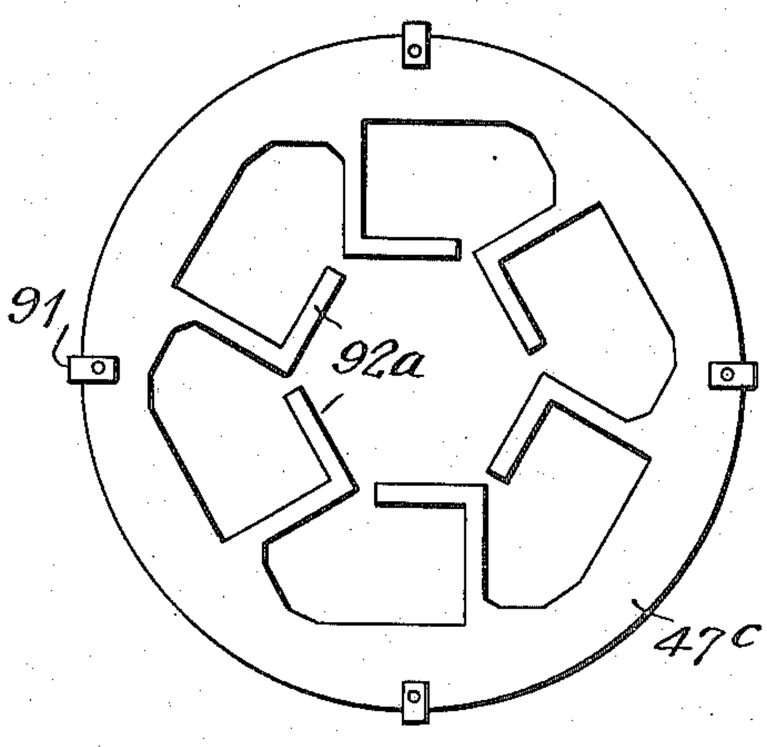


Fig. 7.

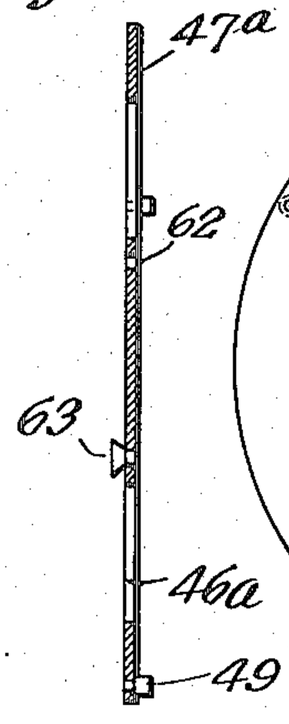
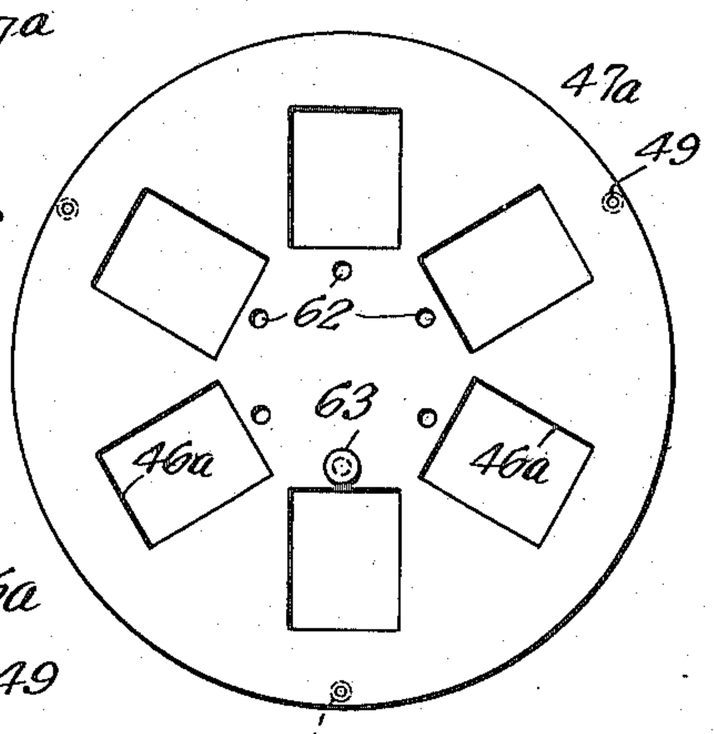


Fig. 8.



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Patented Nov. 18, 1924. 1,515,743

UNITED STATES PATENT OFFICE.

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SURFACING MACHINE.

Original application filed January 19, 1922, Serial No. 530,350. Divided and this application filed June 15, 1923. Serial No. 645,525.

To all whom it may concern:

Be it known that I, WYLLIS H. MARKLAND, a citizen of the United States, and resident of Altoona, Pennsylvania, have invented certain new and useful Improvements in Surfacing Machines, of which the following is a specification.

This application is a division of my application Serial Number 530,351 filed January 19, 1922. In said previous application I have disclosed a machine for surfacing various parts of valves or other articles of manufacture. The machine disclosed is provided with a section for rubbing the seats of valves, a section for surfacing flat pieces, and a section for re-surfacing or truing up the rubbing discs used in the section for surfacing flat pieces. The present application refers to the means for surfacing flat pieces.

An embodiment of the invention is illustrated in the accompanying drawings in which Figure 1. is a transverse vertical section.

Figure 2. is a top plan of parts shown in Figure 1.

Figure 3. is a section on line 3—3 of Figure 1.

Figure 4. is a plan of a work holder.

Figure 5. is a vertical section of the same.

Figure 6. is a plan of an alternative work holder.

Figure 7. is a vertical section and Figure 8 is a plan of an alternative style of work holder.

Referring now to the drawings in detail, the mechanism forming the subject matter of this application is carried on a square table 39 which carries the rotary rubbing disc for surfacing external faces on valves or other pieces of work. The rubbing action is produced by the upper face of a horizontal disc 40, Fig. 1, the work resting face downward on this disc. The disc is centered loosely on the head 41 of a shaft 42 and rests through levelling screws 43 on a plate 44 which is threaded on to the head of the shaft 42 and screwed up against a shoulder on the same so as to be practically permanently fixed thereto; and which has a pin or screw 45 projecting upward in the circular line of the three screws 43 so as to engage one of these and act as a driver. In this way the surfacing plate 40 is accurately supported and positively driven and at the same time can be removed instantly by merely lifting it.

The parts to be surfaced (45ª, Fig. 1) are laid face downward in openings 46, Fig. 2, through a revolving work-holding plate 47 made of a size and shape to suit the work to be finished. The plate 47 overlies the surfacing plate 40, as shown in Fig. 1, and is supported and driven by an annular member 48 surrounding the surfacing plate 40 and rotated slowly in a direction the reverse of that of the surfacing plate. The plate 47 carries on its underside three pins 49 which enter holes in the supporting member 48 so as to center the plate and to permit it to be easily removed and replaced by another with openings of different design and arrangement. Thus the work-holding plates 47 are readily removable without stopping the machine. Also any piece of work can be taken out and replaced by a new one without interfering with those which are being worked on and without stopping the machine. The supporting annulus 48 is mounted at its lower end on a disc 50 which at its center has a hub 51 journalled by means of an intermediate bushing on a post 52 which rises from the fixed supporting table 39. On the underside of the plate 50 is a gear 53 with internal teeth engaging a pinion 54 on the upper end of a shaft 55 which at its lower end carries a pinion 56 engaging a gear 57 on the lower end of the shaft 42. Thus the supporting member 48 and the carrier plate 47 and the articles being surfaced are rotated at a reduced speed and in the opposite direction from the surfacing plate. The shaft 42 is driven through a worm gear 58 at its lower end engaged by a worm 59 on the shaft 60 which is driven from the sprocket 17 and chain 18 from a sprocket 19 on a shaft 64 driven through gears 80 and 81 from a motor 82.

The post 52 has an eccentric bore through which the shaft 42 passes. Thus the surfacing plate rotates on an axis eccentric to that of the carrier, and the articles to be surfaced are carried around in a path eccentric to that of the surfacing plate. They are thus acted upon by practically the entire surface of the plate 40, which tends to keep the surface of the latter true for a longer time and also to produce more accurate surfacing of the work.

This rotary mechanism is used for sur-

facing the external face or faces of articles which have no interfering upstanding walls or projections. The holders 47 can be provided with any number of openings, all alike or varying in size and shape to suit the parts to be finished. An alternative plate 47ª, Fig. 7, and 8, may be substituted for the one shown in Fig. 2, using rectangular openings 46ª for articles of corresponding shape. These figures also show indicating devices for keeping track of the comparative length of time during which the several articles have been in the machine.

When a number of parts are being finished at one time it is desirable that they be inspected at frequent intervals to prevent unnecessary finishing and loss of time. Holes 62 are provided in the carrier plate, one opposite each opening carrying the piece of work, and a marker or button 63 is placed in the hole indicating the first station to be loaded. They are loaded in succession around the circle. When the first station is emptied the marker can be moved to the hole opposite the next station, indicating that this work piece is the oldest on the machine. In the case of the six stations shown, assuming the finishing time to be six minutes, one station must be emptied and refilled and the marker advanced every minute.

In the case assumed any one piece found to be inadequately surfaced can be put back and will become No. 1 station after six one minute intervals have elapsed and the succeeding five pieces have been removed and replaced. The work for which the particular machine shown is designed is to be of the maximum accuracy, not merely smooth or relieved of roughness but absolutely flat. Each piece of work, when it is thought to be done, is tested carefully and for the slightest imperfection is put back on the surfacing machine.

According to Figs. 4 and 5 a different method is illustrated of centering and driving the work-holding plate indicated at 47ᵇ. A single pin 49 is used for insertion in the hole of the ring which drives the holder. Bent strips 91 are mounted on the edge at intervals forming flanges adapted to drop easily over the annular driving member and to center it.

In Fig. 4 also I have shown a different style of holder consisting of a ring of metal with separate hooks 92 fastened thereon and projecting into the center and embracing the work on its rear side so as to carry it forward in the direction of the arrow and to permit it to be removed easily, not only by lifting, but also by giving it a slight forward movement faster than that of the hook 92 which carries it.

In Fig. 6 I have shown at 92ª a modified style of such a hook and have shown the same stamped out integrally with the ring 47ᶜ of the plate.

Though I have described with great particularity of detail certain embodiments of my invention yet it is not to be understood therefrom that the invention is restricted to the particular embodiments disclosed. Various modifications thereof in detail and in the arrangement of the parts may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is:

1. A machine of the class described including in combination a rotating surfacing plate, a carrier surrounding said surfacing plate and a work holding plate removably engaged by said carrier.

2. A machine of the class described including in combination a rotating surfacing plate, a rotating carrier surrounding said surfacing plate and a work holding plate adapted to be engaged with said carrier or disengaged therefrom while the carrier is rotating.

3. A machine of the class described including in combination a rotating surfacing plate, a carrier surrounding said surfacing plate and rotating on an axis eccentric to that of the surfacing plate.

4. A machine of the class described including in combination a shaft, a rotary surfacing plate freely centered on the end of said shaft, a supporting and driving plate therefor rotating with said shaft and means for levelling the surfacing plate on and driving it with said supporting and driving plate.

5. A machine of the class described including in combination a bearing post having an eccentric bore, a shaft in said bore and a rubbing plate axially aligned with and driven by said shaft, a work-carrying member surrounding said rubbing plate and journalled centrally on said post and means for rotating said work-holding member and said shaft about their axes which are eccentric to each other.

In witness whereof, I have hereunto signed my name.

WYLLIS H. MARKLAND.