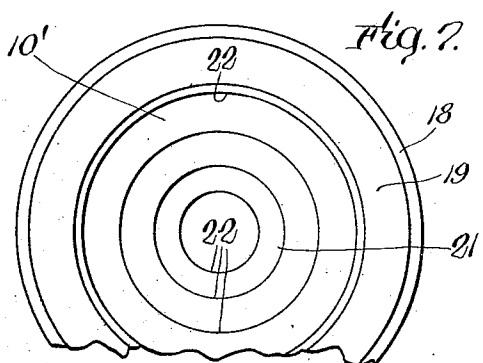
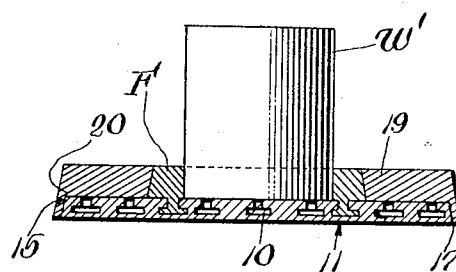
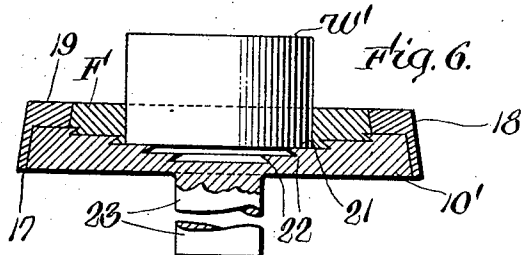
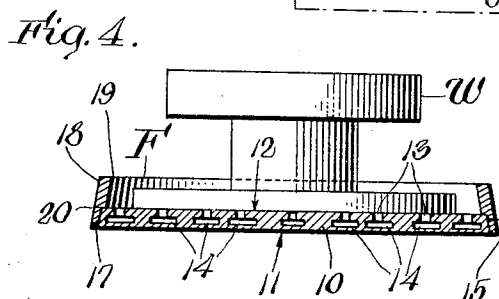
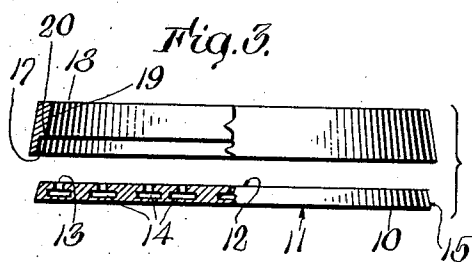
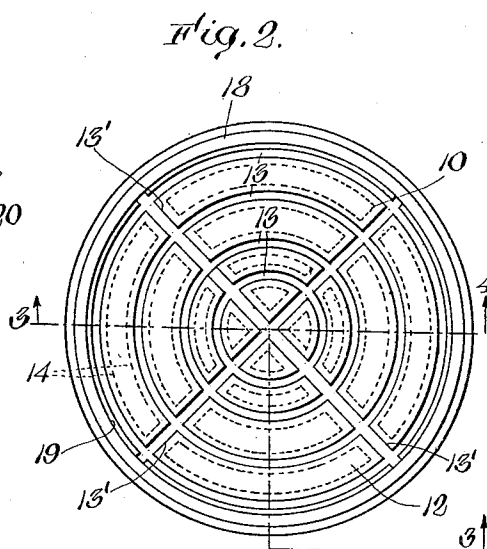


1,331,030.



Inventor:
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by L. B. Weymouth,
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UNITED STATES PATENT OFFICE.

JOHN EDWARD RYAN, OF BOSTON, MASSACHUSETTS.

DEVICE FOR HOLDING TOOLS OR WORK.

1,331,030.

Specification of Letters Patent.

Patented Feb. 17, 1920.

Application filed October 19, 1917. Serial No. 197,453.

To all whom it may concern:

Be it known that I, JOHN EDWARD RYAN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Devices for Holding Tools or Work, of which the following is a specification.

This invention has reference particularly to improvements in devices for holding tools or work in a lathe or other machine.

One object of the invention is to provide improved means for utilizing a magnetic chuck for the purpose of effectively holding work of nonmagnetic material in a machine without danger of crushing or otherwise injuring the work by the engagement of said means therewith.

Another object of the invention is to provide an improved method of applying work of nonmagnetic material to a magnetic chuck.

Other objects of the invention will appear from the following description.

The invention consists in attaching the work to a plate of magnetic material by means of a fusible metal.

The invention further consists in such other novel features as shall hereinafter be described and pointed out in the claims.

Figure 1, represents a transverse sectional view of a work holding device embodying my invention applied to a common type of magnetic chuck, with a piece of work held thereby.

Fig. 2, represents a plan view of the work holding device with the work and fusible metal removed.

Fig. 3, represents a sectional view, partly in elevation, taken on the line 3—3 of Fig. 2, showing the base plate and retaining ring separated.

Fig. 4, represents a sectional view taken on the line 3—4 of Fig. 2, with the base plate and retaining ring assembled and showing a piece of work supported upon the base plate.

Fig. 5, represents a view similar to Fig. 1, showing the work supporting device holding a piece of work of a different shape than the one shown in Fig. 1.

Fig. 6, represents a transverse sectional view of a modified form of a work holding device.

Fig. 7, represents a plan view of same with the work and fusible metal removed.

Like characters of reference designate corresponding parts throughout.

The circular plate 10 of my preferred work holding device is made of iron or other magnetic material and is provided with the clutch engaging bottom face 11 adapted to be engaged by the magnetic clutch C, and is further provided with the top face 12 having a series of concentric annular grooves 13. The lower or inner portions 14 of said grooves are enlarged. The periphery 15 of base plate 10 is beveled upwardly and inwardly to frictionally engage the lower corresponding portion 17 of a retaining ring 18. The upper portion or flange 19 of the latter projects inwardly forming the shoulder 20 and its inner surface is beveled upwardly and inwardly. Retaining rings having the inside diameters of their upper portions 19 of various sizes are employed; the respective sizes of said inside diameters being dependent upon the sizes of the pieces of work.

Concentric grooves 13 assist in centrally positioning the work W on base plate 10. After the work is positioned on said base plate and the proper size retaining ring has been securely attached to the periphery of said base plate by frictional engagement, as shown in Fig. 4, the fused metal F is poured about the lower portion of the work until it fills the space between the work and said retaining ring and extends down into the exposed annular groove 13. The fusible metal is then allowed to solidify by cooling. The expansion of the fusible metal as it cools causes it to be securely anchored in groove 13 and between the inside beveled surface 19 of the retaining ring and the work, thereby firmly securing the work in the proper position on the base plate. In Fig. 1 the fusible metal is shown as engaging a flange on the piece of work W but I find that the expansion of the metal as it cools is sufficient in many cases to properly hold even a straight cylindrical piece of work W' on the base plate. (Fig. 5.) In Fig. 5 the upper portion 19 of the retaining ring is shown projecting an appreciable distance over the base plate in order to utilize but a minimum amount of fusible metal for the size of the piece of work.

It is to be understood that the term work is employed both in the preceding description and in the following claims in an illus-

trative and not in a restrictive sense, and is, therefore to include tools held by the clutch to perform work, as well as articles held by the clutch for the purpose of being turned
5 or otherwise being operated upon.

It will be observed that a piece of work having a very delicate or fragile surface may be held by my device without danger of crushing or otherwise injuring the sur-
10 face thereof.

After the work is thus applied to the device, it may be readily attached to the magnetic chuck C through the magnetic base plate 10.

15 Upon the removal of the holding device from the chuck, the piece of work may be readily detached therefrom by again melting the fusible metal.

In the modified form of holding device shown in Figs. 6 and 7 the base plate 10' is provided with the cavity 21 having the stepped dovetailed grooves 22 concentric with each other which assist retaining ring 18 in anchoring the fusible metal on said
20 base plate and also assist in centering the work. The underside of said base plate 10' is shown as being provided with the shank or stock 23 adapted to be placed in a mechanically operated chuck.

30 Any easily fusible metal or alloy F may be employed as those composed of bismuth, lead and tin.

Plate 10 may be further provided with the radial grooves 13' to assist in preventing
35 the metal F, when solidified from turning on said plate.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent:

1. A work holding device comprising a base for engagement with a chuck, with means thereon for supporting the work, said base constructed to receive fused metal to secure the work to said base when said fused metal is solidified. 40 45

2. A work holding device comprising a base, means on one side thereof for engagement with a chuck, the opposite side of said base adapted to support the work and provided with a series of concentric grooves therein, said latter side constructed to receive fused metal to secure the work to said base when said fused metal is solidified. 50

3. A work holding device comprising a base for engagement with a chuck, with means thereon for supporting the work, said base provided with an annular groove for receiving fused metal to effect the attachment of the work to said base and to assist in the positioning of the work on said base. 60

4. A work holding device for securing work to a magnetic chuck comprising a member of magnetizable material having one side constructed for engagement with a magnetic chuck and its other side for supporting the work, and a wall projecting beyond the work supporting surface of said member to sustain fused metal thereon, whereby the fused metal when solidified co-
65 operates with the wall to secure the work to said member. 70

In testimony whereof I have affixed my signature.

JOHN EDWARD RYAN.