June 12, 1928.

1,673,719

H. E. TRACY

ANGULAR MAGNETIC CHUCK

Filed Aug. 15, 1927 2 Sheets-Sheet 1

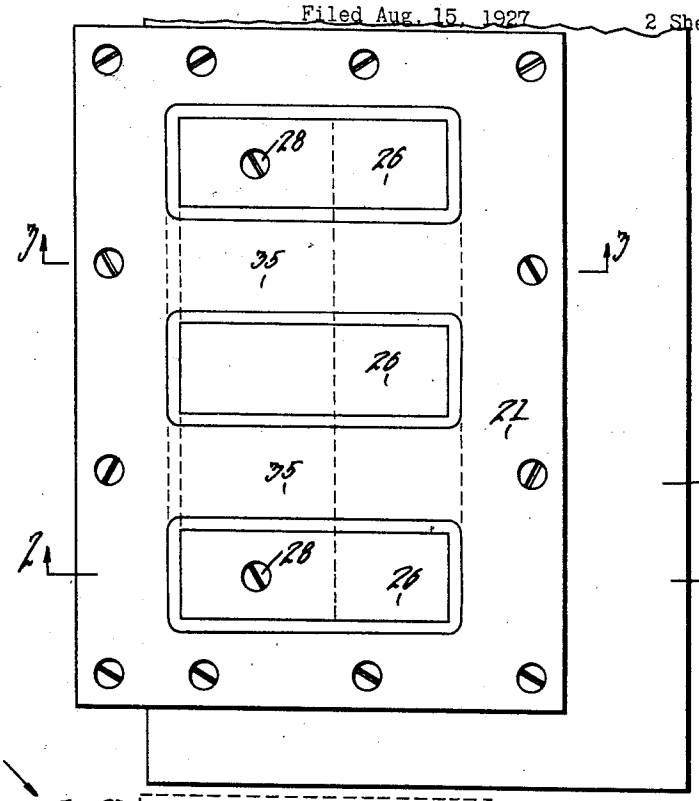


Fig. 1.

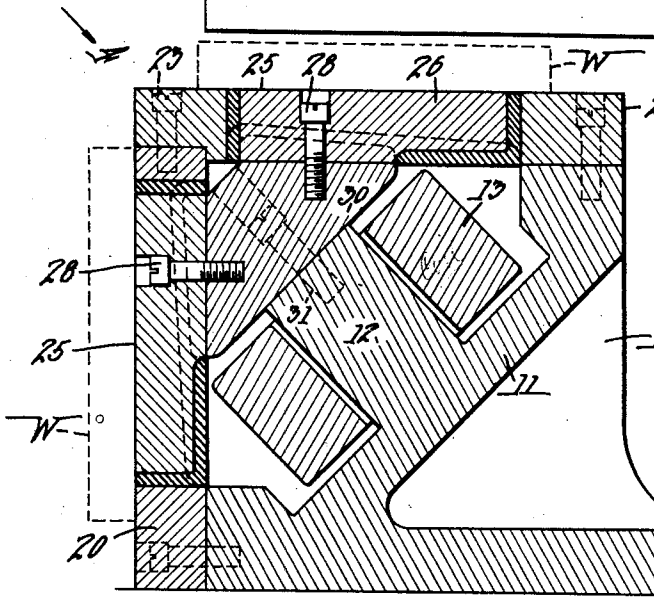


Fig. 2.

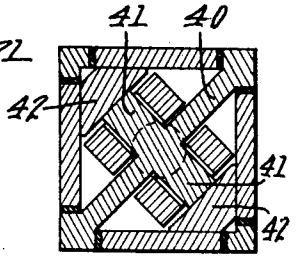


Fig. 7.

Inventor-
Howard E. Tracy
By Attorneys
Southgate Fay & Hawley

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H. E. TRACY

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2 Sheets-Sheet 2

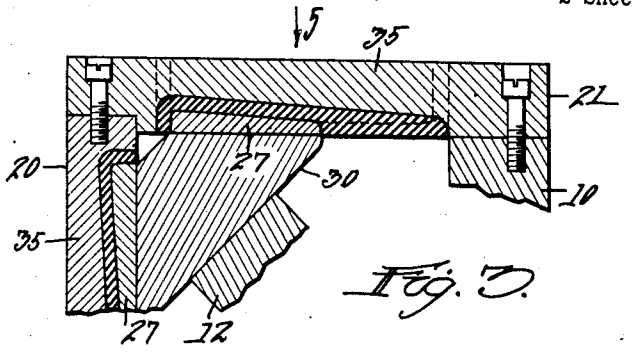


Fig. 3.

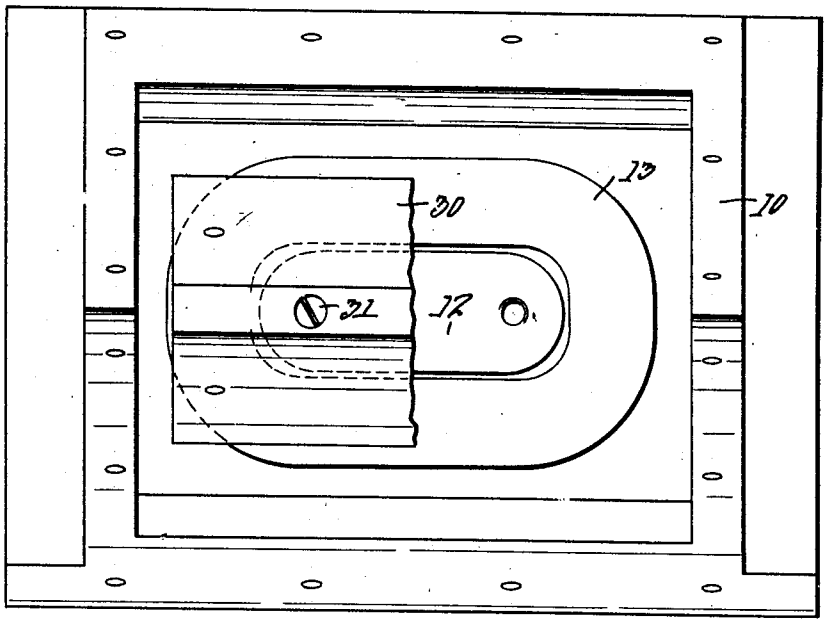


Fig. 4.

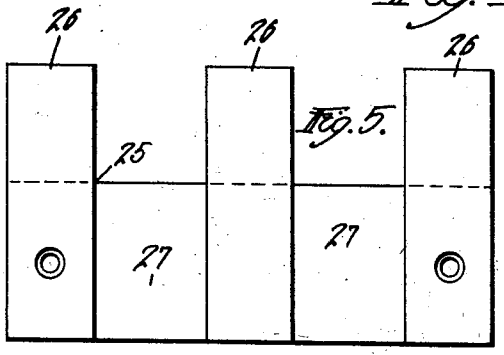


Fig. 5.

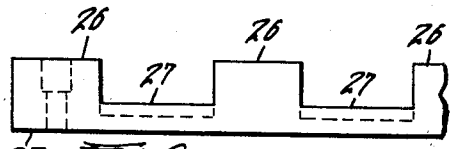


Fig. 6.

Inventor
Howard E. Tracy
By Attorneys
Lamb Hyde Fay & Hawley

Patented June 12, 1928. 1,673,719

UNITED STATES PATENT OFFICE.

HOWARD E. TRACY, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO O. S. WALKER CO., INC., OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ANGULAR MAGNETIC CHUCK.

Application filed August 15, 1927. Serial No. 213,008.

This invention relates to a magnetic chuck in which two work-engaging faces are provided, which are disposed at a substantial angle to each other so that work can be supported on either or both of the two non-parallel faces.

It is a general object of my invention to provide a construction in which two angularly disposed work faces may be energized by a single magnetic assembly. In the preferred form the work faces are perpendicular to each other and are at 45° to the axis of the magnet coil.

A further object is to provide a simple and economical construction by which an angular magnetic chuck may be easily and cheaply produced.

My invention further relates to arrangements and combinations of parts which will be hereinafter set forth and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings in which

Fig. 1 is a plan view of my improved chuck;

Fig. 2 is a sectional elevation, taken along the line 2—2 in Fig. 1;

Fig. 3 is a partial sectional elevation, taken along the line 3—3 in Fig. 1;

Fig. 4 is an inclined plan view of the magnet coil and base, looking in the direction of the arrow 4 in Fig. 2;

Fig. 5 is a plan view of one of the pole pieces, looking in the direction of the arrow 5 in Fig. 3;

Fig. 6 is a front elevation of the pole piece shown in Fig. 5; and

Fig. 7 is a sectional view of a four face chuck embodying my invention.

Referring to the drawings, my improved magnetic chuck comprises a base or frame 10 adapted to be bolted or otherwise secured to a machine table or other suitable surface. The upper portion 11 of the base 10 is disposed at an angle of substantially 45° to the lower surface and is provided with a core 12 projecting therefrom and preferably formed integral therewith. A magnetic coil 13 is positioned in a recess on the core 12, said coil being connected to an operating circuit in the usual way.

A work-engaging plate 20 is secured to the side of the base 10 and a similar plate 21 is secured to the top of the base 10. The free edge of the plate 21 overlaps the upper edge of the plate 20 and is firmly secured thereto by screws 23. The plates 20 and 21 are recessed to receive pole pieces 25 (Figs. 5 and 6). Each pole piece in the preferred form comprises three work-engaging portions 26 joined together at one end by connecting portions 27.

Each pole piece is inserted from the inside in its corresponding work plate and is firmly secured thereto by a packing of Babbitt or other non-magnetic metal. The pole pieces are also secured by screws 28 to a core extension 30 (Fig. 2) which is preferably substantially triangular in cross section and which is firmly attached to the core 12 by screws 31.

The inner sides of the plates 20 and 21 are recessed to provide room for the connecting portions 27 and are magnetically insulated therefrom by additional Babbitt or non-magnetic material, as clearly shown in Fig. 3.

With this construction, it will be seen that the work-engaging plates 20 and 21 and the connecting portions 35 thereof (Fig. 1) between the pole pieces are all directly connected magnetically through the base 10 to the lower end of the core 12, while the pole pieces 25 are directly connected through the core extension 30 to the upper end of the core 12.

When a piece of work W is applied to either the side or the top of the chuck, as indicated in broken lines in Fig. 2, it will bridge across the magnetic gap between the portions 26 of the pole pieces 25 and the adjacent portions of the face plates which are directly connected to the base, thus completing the path for the magnetic lines of force and being firmly held in position against either the top or the side face of the chuck.

I am thus able, by a very easily constructed arrangement, to provide a chuck having both vertical and horizontal work-engaging faces, either or both of which are at all times available for immediate use, and both of which are energized by a single magnet coil. All of the parts are both simple to construct and easy to machine and the magnet coil is particularly well protected from accidental injury.

In Fig. 7 I have shown my invention applied to a four face chuck adapted to be

mounted on trunnion supports. In this construction the frame member 40 is provided with oppositely disposed core members 41, each having a core extension 42. Two angularly disposed pole pieces are secured to each extension 42. The operation of the device is the same as previously described.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what I claim is:

1. A magnetic chuck having a top face plate, a side face plate, a base supporting said plates, a pole piece for each plate, and a single magnet assembly energizing both pole pieces.

2. A magnetic chuck having a top face plate, a side face plate, a base supporting said plates, a pole piece for each plate, and a single magnet assembly energizing both pole pieces, said magnet assembly being mounted on said base in a position substantially equally inclined to both of said face plates.

3. A magnetic chuck having a top face plate, a side face plate, a base supporting said plates, a pole piece for each plate, a single magnet assembly energizing both pole pieces, and a core for said magnet assembly formed on said base and having an extension engaging both pole pieces and supporting said pole pieces with their work-engaging faces substantially perpendicular to each other.

4. A magnetic chuck comprising a base having a magnet core formed thereon in an inclined position, a magnet coil on said core, and a pair of work-engaging faces energized by said magnet and mounted on said core in spaced relation to each other and substantially perpendicular to each other.

5. A magnetic chuck having a top face plate, a side face plate, a base supporting said plates, a pole piece for each plate, a single magnet assembly energizing both pole pieces, and a core for said magnet assembly formed on said base and having an extension engaging said pole pieces and supporting said pole pieces substantially perpendicular to each other and each at substantially 45° to the axis of said core.

6. A magnetic chuck comprising a magnet coil, a core therefor, a base supporting said core, a core extension, work-engaging pole pieces secured to said core extension and disposed at a substantial angle to each other, and face plates surrounding said pole pieces and separated therefrom by portions of non-magnetic material, said face plates being mounted on said base.

7. A magnetic chuck comprising a magnet coil, a core therefor, a base supporting said core at an angle of substantially 45° to the bottom of said base, a core extension secured to said core, and pole pieces secured to said core extension and positioned respectively parallel and perpendicular to said base, said pole pieces forming portions of the work-engaging faces of said chuck.

8. A magnetic chuck comprising a casing having a base and top and side work-engaging portions, a core projecting from said base between said top and side portions, a magnet coil on said core, a pair of pole pieces positioned one within said top portion and one within said side portion, and a core extension connecting said two pole pieces to said core and supporting said pole pieces in fixed position relative to said casing.

9. A magnetic chuck comprising a frame member, core pieces projecting from opposite faces thereof, magnet coils therefor, a coil extension secured to each core piece outside of said coils and having two faces disposed at a substantial angle to each other, and work-engaging pole pieces secured to said faces of said core extensions.

10. A magnetic chuck comprising a frame member, core pieces projecting from opposite faces thereof, magnet coils therefor, a coil extension secured to each core piece outside of said coils and having two faces disposed at a substantial angle to each other, and work-engaging pole pieces secured to said faces of said core extensions in a substantially rectangular four face assembly.

In testimony whereof I have hereunto affixed my signature.

HOWARD E. TRACY.