Oct. 1, 1963 C. R. GRAGE 3,105,330

WORK HOLDING FIXTURE FOR GRINDERS

Filed Dec. 12, 1960 2 Sheets-Sheet 1

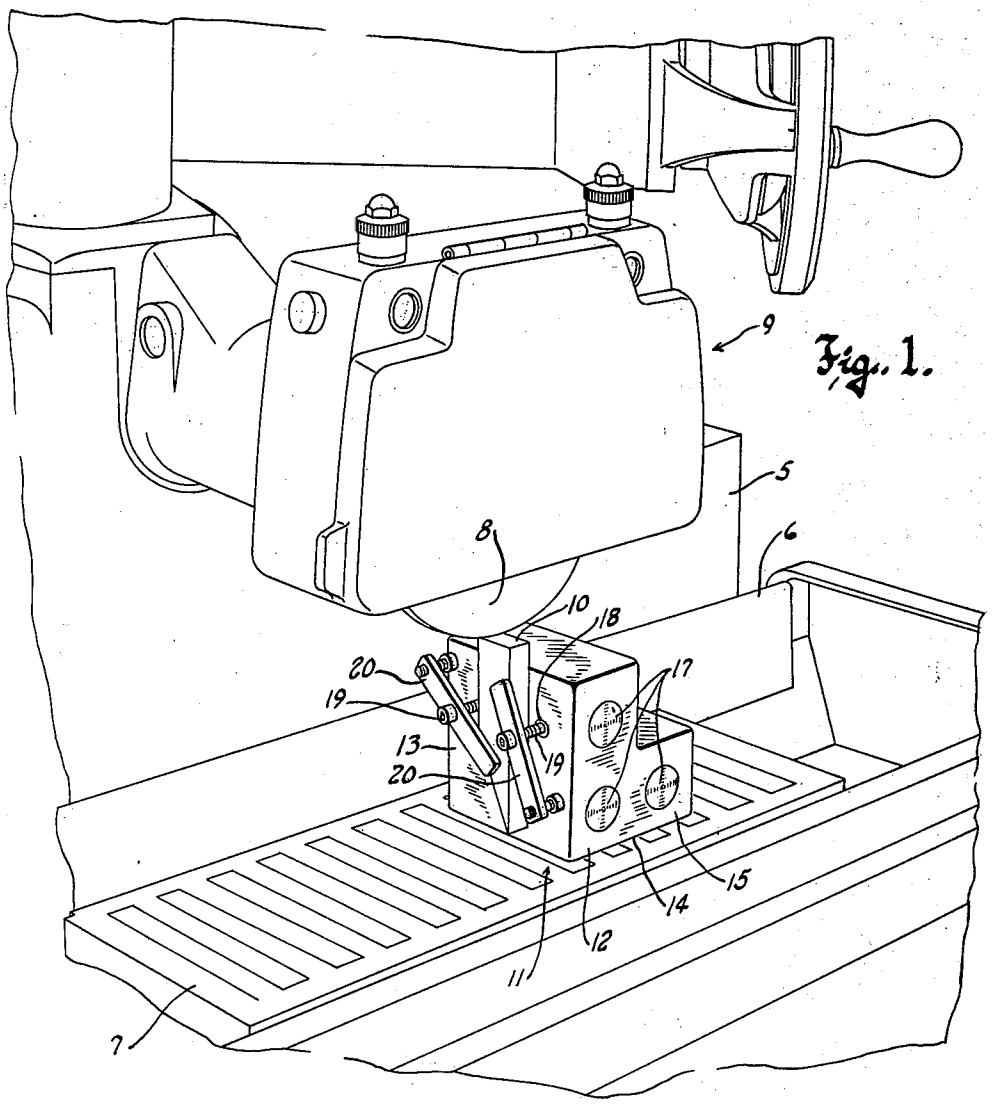


Fig. 1.

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Oct. 1, 1963 C. R. GRAGE 3,105,330

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Filed Dec. 12, 1960 2 Sheets-Sheet 2

Fig. 2.

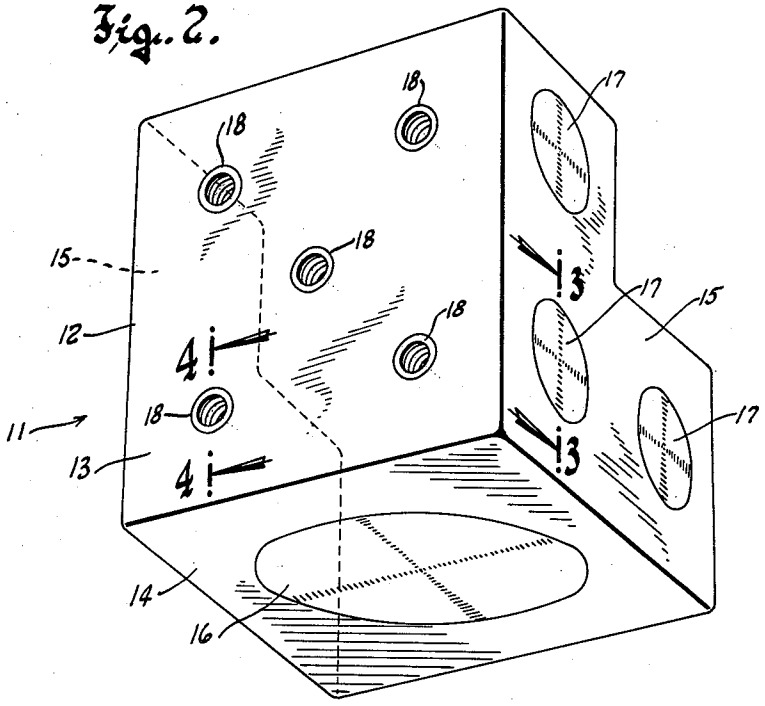


Fig. 3.

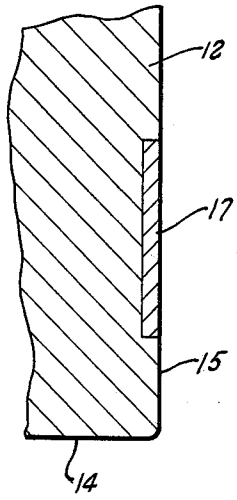
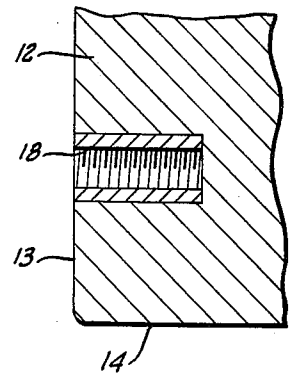


Fig. 4.



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WORK HOLDING FIXTURE FOR GRINDERS

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1 Claim. (Cl. 51—217)

This invention relates to work holding fixtures, and refers more particularly to a fixture especially adapted to hold a part to be ground in proper predetermined position in a grinder equipped with a magnetic chuck.

Precision grinders are now generally equipped with magnetic chucks, by which the work to be ground is securely held. Often, however, the part to be ground will not be properly positioned if it is simply set on the surface of the magnetic chuck and there held. In such cases it is necessary to provide an adaptor or fixture which seats upon the surface of the magnetic chuck and has means to hold the part to be ground in proper positional relationship to the grinding wheel.

The present invention concerns such adaptors or fixtures, and has as its purpose to provide an improved fixture of this type.

More particularly, it is an object of this invention to provide an adaptor or fixture of the character described which is essentially formed of granite, so as to have all of the advantages characteristic of granite which, among other things, include a lower coefficient of expansion, greater accuracy, less susceptibility to nicks and scratches, and, in general, a more precise form of holder or fixture.

Granite, of course, cannot be held by a magnetic chuck and, accordingly, the invention contemplates the incorporation of strategically located inserts of magnetic material embedded in the granite body of the fixture, to enable the magnetic chuck to securely hold the fixture in a required position on the chuck.

To further adapt the fixture for this purpose, it is an object of this invention to provide the same with work clamping means positioned in predetermined relationship to the inserts of magnetic material.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claim, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claim.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is a perspective view showing a portion of a surface grinder of the type now commonly used for precision work, and which, as is customary, is equipped with a magnetic chuck, and illustrating the adaptation of this invention thereto.

FIGURE 2 is a perspective view of the fixture of this invention;

FIGURE 3 is a fragmentary detail sectional view through FIGURE 2 on the plane of the line 3—3; and

FIGURE 4 is a fragmentary detail sectional view through FIGURE 2 on the plane of the line 4—4.

Referring now particularly to the accompanying drawings, the numeral 5 designates the frame of a surface grinder upon which a carriage 6 is mounted for horizontal reciprocatory motion.

The carriage 6 carries a magnetic chuck 7 having a flat, horizontal work supporting surface upon which the work to be ground by the grinding wheel 8 is ordinarily

directly mounted and held. The grinding wheel 8, as is customary, is carried by a head designated generally by the numeral 9, and is driven at high speed. Suitable means are provided for raising and lowering the grinding wheel and, as is customary, the grinder is equipped with means to effect the reciprocatory motion of the carriage 6 and to index it in or out as needed to bring different portions of the work carried thereby under the grinding wheel.

To enable the grinding of parts that cannot be properly positioned by simply setting them directly on the magnetic chuck, such as the piece indicated by the reference numeral 10, this invention provides a work-holding fixture 11. The fixture 11 comprises essentially an angle-shaped block 12 of granite, having two major flat, right-angularly disposed surfaces 13 and 14, and two angle-shaped opposite sides 15. Embedded in the granite block directly below its surface 14 is a large disc 16 of soft steel or other suitable magnetic metal, and embedded in each of the opposite side portions of the block are three similar, though smaller inserts 17. The outer faces of the inserts 16 and 17 are flush with the adjacent surfaces of the granite block and, as will be readily apparent, by virtue of these inserts of magnetic metal, the block may be drawn solidly to the surface of the magnetic chuck with its face 14 or either side 15 seated upon the chuck.

The granite block also has five internally threaded tubular inserts 18 embedded therein, with their outer ends flush with the face 13 of the block. Clamping screws 19 may be threaded into any of these inserts 17, so as to enable a part, such as the piece 10, to be clamped to the face 13 of the granite block. To clamp the piece 10 to the block, a pair of clamping bars 20 are employed in addition to screws 19. The bars are so placed that by tightening down upon certain of the screws and backing off others, the inner ends of the bars 20 will be drawn tight against the outer face of the piece 10 to thereby clamp the same against the surface 13 of the granite block. Obviously, the position of the piece 10 on the surface 13 must be accurately established, to ensure the desired accuracy in the grinding of the upwardly facing end of the piece.

By virtue of the magnetic metal inserts in the opposite sides 15, the block can be mounted with either of these sides down, if such positioning of the granite block is found more suitable to proper placement of the part to be ground.

From the foregoing description, taken in connection with the accompanying drawings, it will be apparent to those skilled in this art that this invention provides a simple, though highly effective fixture for accurately positioning and holding odd-shaped parts to be ground on the magnetic chuck of a precision grinder.

What is claimed as my invention is:

A fixture for accurately positioning and holding a part to be ground on a grinder equipped with a magnetic chuck, said fixture comprising:

(A) an L-shaped block of granite having
  (1) a pair of adjacent surfaces, one on the exterior of each leg of the L, that are normal to one another, and
  (2) two other exterior surfaces that are opposite to one another and mutually perpendicular to said pair of adjacent surfaces;

(B) an insert of magnetic metal embedded in the block and having an exposed surface flush with one of said pair of adjacent surfaces, whereby the block can be held to a magnetic chuck with the other of said pair of adjacent surfaces perpendicular to the surface of the magnetic chuck;

(C) a plurality of threaded tubular inserts embedded in the block, opening to the other of said pair of adjacent surfaces and with their axes perpendicular thereto, no portion of any of said inserts protruding beyond said surface to which the inserts open;

(D) a clamping screw threaded into each of said tubular inserts;

(E) clamping bars connected with said screws to clamp a part against said surface to which the inserts open upon actuation of said screws; and

(F) other inserts of magnetic metal embedded in the block and having their faces exposed at said two other opposite faces of the block.

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