Nov. 1, 1938. C. E. BURT 2,134,749

METHOD OF MAKING CAST IRON SLIPS FOR OIL TOOLS

Filed Jan. 21, 1937

Fig. 1.

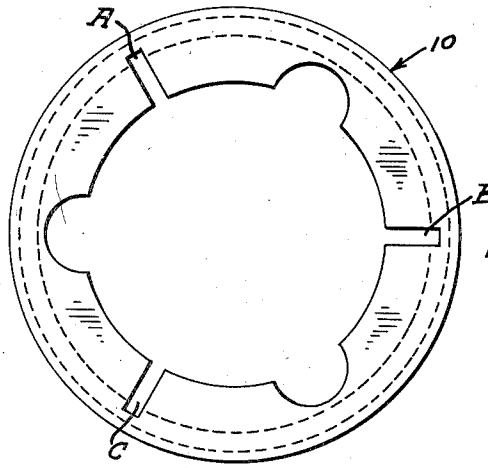


Fig. 5.

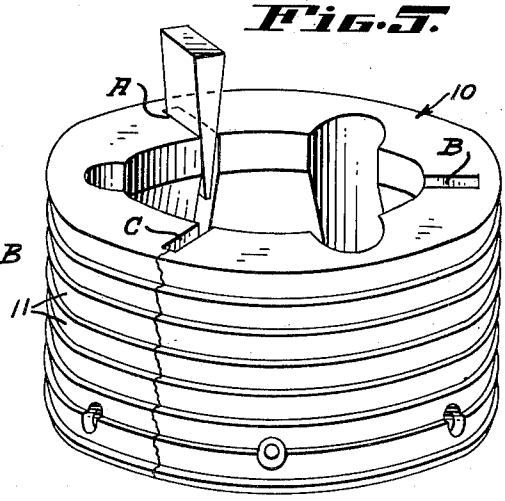


Fig. 2.

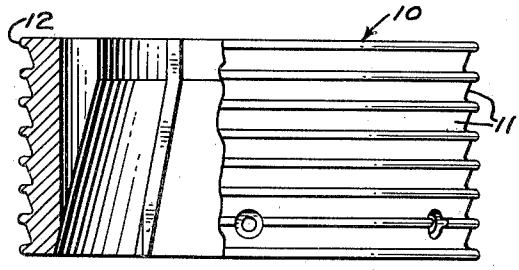


Fig. 6.

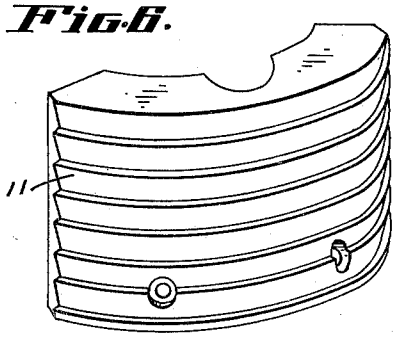


Fig. 3.

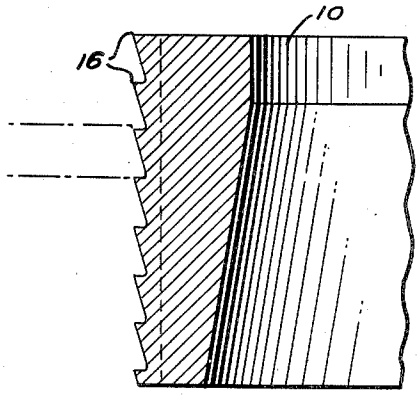
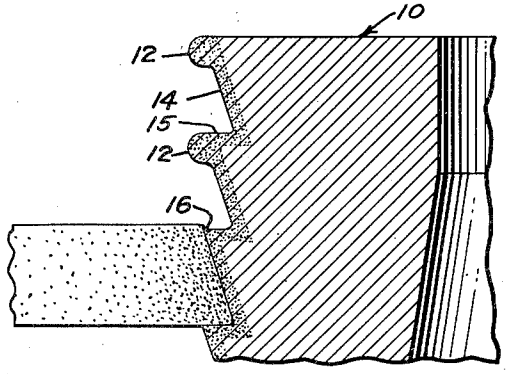


Fig. 4.



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METHOD OF MAKING CAST IRON SLIPS FOR OIL TOOLS

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Application January 21, 1937, Serial No. 121,540

1 Claim. (Cl. 29—148)

This invention relates to tools used in oil wells and particularly pertains to a method of producing what are generally known as slips used on cement retainers, fishing tools and the like for gripping a well casing or tubing.

Prior to my invention slips were made of steel so that the wickers would be sufficiently hard and sharp to cut into the casing or tubing to firmly grip the same. Because in some instances it is desirable to break out the slips and drill them up in the well bore, the use of steel is unsatisfactory due to the difficulty in breaking and drilling them up. For this reason the use of slips constructed of frangible material such as cast iron is highly desirable, but heretofore impractical due to the fact that the wickers would be too soft to cut into the steel casing. Attempts have been made to cast slips out of iron with the cutting surfaces of the wickers chilled so as to provide the necessary hardness. However, in casting the slips and chilling the surfaces of the wickers the molten metal will not flow into the sharp recesses in the chill which form the cutting edges of the wickers. Consequently, these edges were rounded and the wickers were inoperative. Any attempt to grind the wickers so formed to form a cutting edge resulted in grinding away the chilled hardened surface, leaving the cutting edges of the wickers soft and valueless for their purpose.

It is the principal object of my present invention to provide an improved method of producing cast iron slips having exceedingly hard and sharp cutting edges so that the slips produced are as effective as steel slips but can be easily broken and drilled up in the well bore.

In practicing my invention, the slips are cast with the faces of the wickers chilled. At the intersecting faces of each wicker a semi-cylindrical bead is formed on the casting, which bead is ground off flush with the face on which it is formed, thereby forming a sharp hard cutting edge at the intersection of the two faces of the wicker.

The invention is exemplified in the following description and illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is a plan view of a casting formed in accordance with my invention.

Fig. 2 is a side elevation of the same, partly in section.

Fig. 3 is an enlarged vertical sectional view showing the manner in which the wickers are ground.

Fig. 4 is an enlarged fragmentary view showing the chilled surfaces of the wickers and the manner of grinding the same.

Fig. 5 is a perspective view showing the manner in which the casting is divided to form segmental slips.

Fig. 6 is a perspective view of a finished slip.

Referring to the accompanying drawing, 10 indicates a slip casting which is in the form of a ring and which is ultimately divided as described and claimed in my copending application entitled "Method of producing slips for oil well tools", filed January 21, 1937, bearing Ser. No. 121,539, into a plurality of segmental slips.

The slip casting 10 is in the form of a cylindrical ring as illustrated having wickers 11 circumscribing its exterior periphery. In casting, a chill is provided for the exterior surface and is so formed that a small bead 12 is formed on the circumferential face 14 of each wicker at the point where it intersects with the radial face 15 of the wicker. This bead is preferably semi-cylindrical in cross section with its flat base on the face 14 of the wicker and with one side edge terminating at the radial face 15 so that a line drawn through the base of the bead 12 flush with and aligning with the face 14 will sharply intersect the face 15 of the wicker.

I have found that the hardened surface formed by chilling extends to a uniform depth along the face 14 to the face 15 of the wicker regardless of the provision of the bead as illustrated in Fig. 4. Thus, when the bead is removed by grinding, a hardened cutting edge 16 results.

After the casting 10 has been produced, the circumferential face 14 is ground on a wheel having a grinding face parallel with the face 14. This grinds off the bead 12 flush with the face 14 so that the latter will sharply intersect the radial face 15 of the wicker. This forms an exceedingly hard sharp cutting edge having all of the desirable qualities of wickers on steel slips. Due, however, to the fact that the slips are of cast iron, they may be easily broken and drilled up in the well bore when desired. After the wickers have been ground as described, the casting 10 is divided at the points A, B and C to provide three segmental slips.

From the foregoing it is obvious that I have provided an improved method of producing cast iron slips for oil well tools, which slips have all the desirable characteristics of steel slips as well as the desirable characteristics of cast iron slips without the disadvantageous features of both.

While I have described and illustrated my improved method in detail, it is to be understood

that various changes may be made therein by those skilled in the art without departing from the spirit of the invention as defined in the appended claim.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

A method of producing cast iron slips which comprises producing a slip casting in the form of a ring, said casting having wickers circumscribing the peripheral face thereof and having a bead formed on the peripheral face of each wicker contiguous to the radial face thereof, hardening the faces of said wickers by chilling the same during the casting thereof, grinding off the bead so formed flush with the circumferential face of said wicker so that said face sharply intersects the radial face thereof, and then dividing said ring casting radially to form segmental slips.

CLARENCE E. BURT.