April 8, 1930. R. A. WILSON ET AL 1,753,543

COMPOUND SLIP

Filed Dec. 6, 1926 3 Sheets-Sheet 1

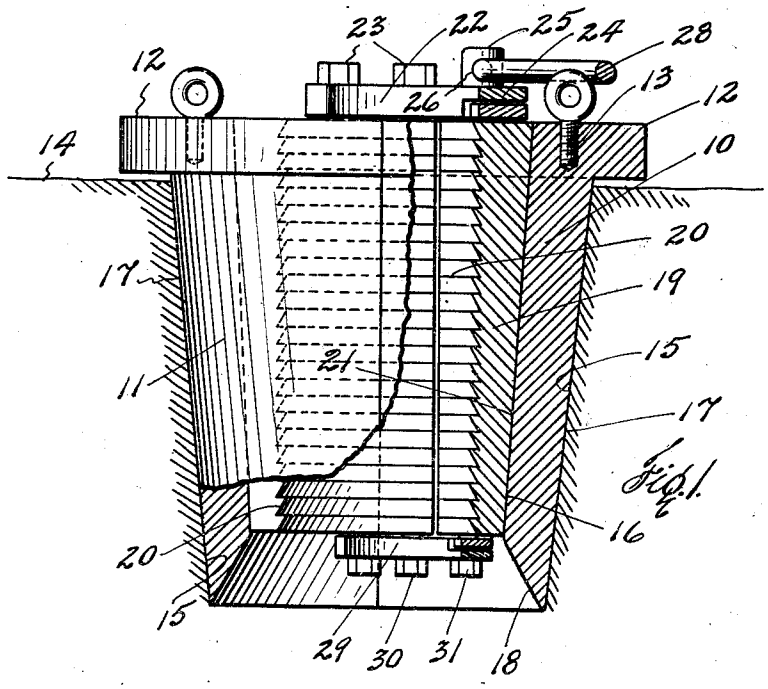


Fig. 1.

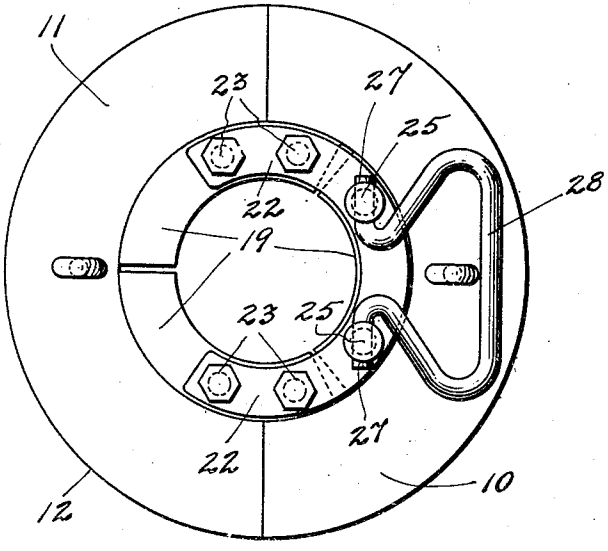


Fig. 2.

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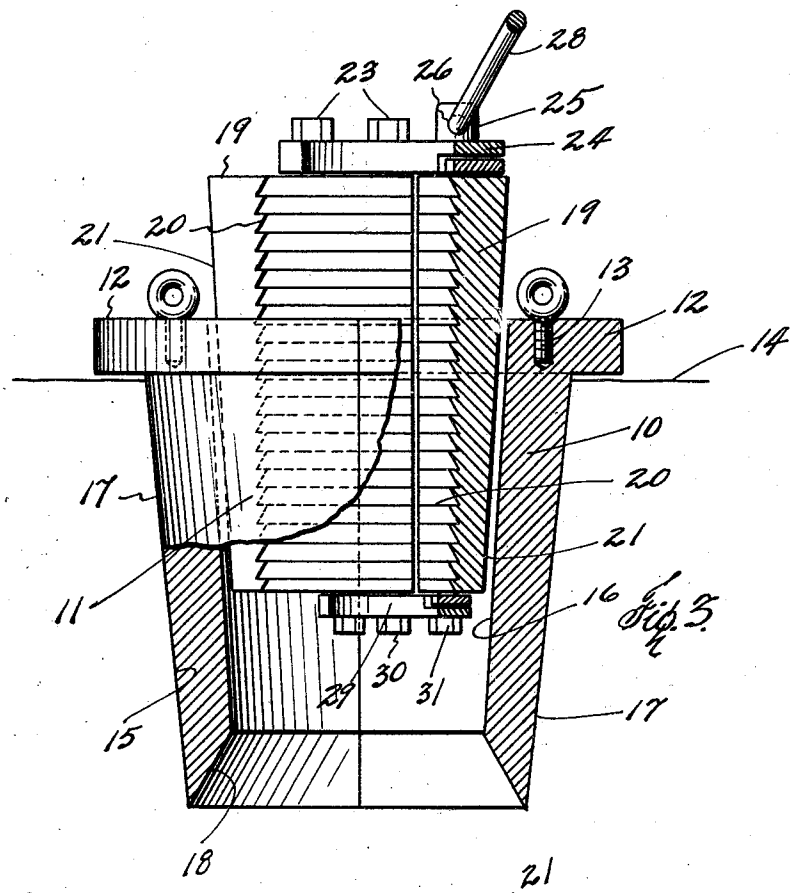


Fig. 3.

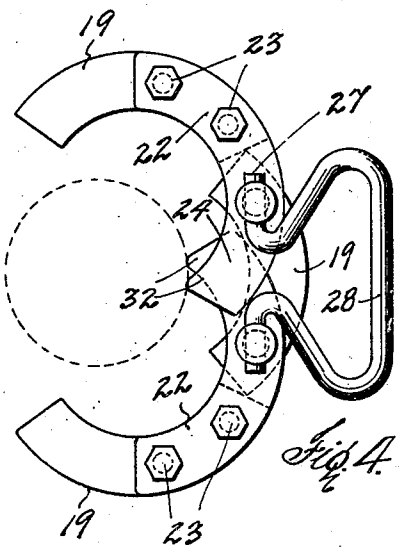


Fig. 4.

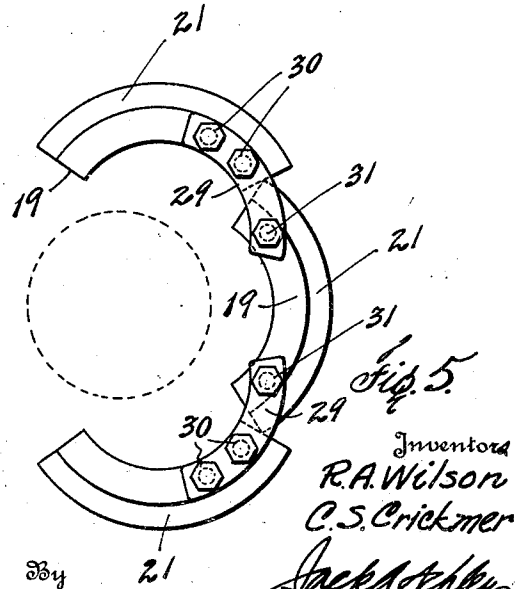


Fig. 5.

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COMPOUND SLIP

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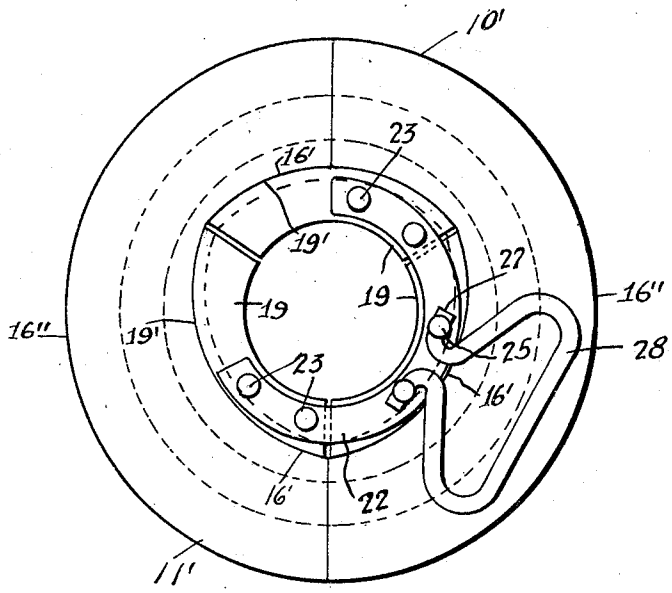


Fig. 6.

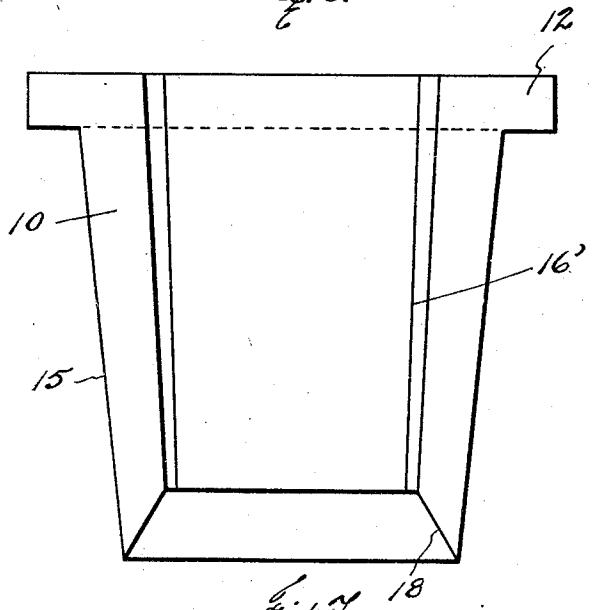


Fig. 7.

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UNITED STATES PATENT OFFICE

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COMPOUND SLIPS

Application filed December 6, 1926. Serial No. 152,776.

This invention relates to new and useful improvements in compound slips comprising a plurality of toothed core members.

The object of the invention is to provide slips comprising an outer slip member or jacket and an inner slip member or core, the jacket having its outer surface or walls inclined to a less degree than its inner walls, whereby when the slips are lifted the outer surfaces of the jacket will disengage from the socket prior to the disengagement of the core from the inner walls of the jacket, and also whereby the jacket will disengage from the core and fall back into its socket after the initial movement, thus freeing the core and making for easier removal as well as the elimination of the usual practice of hammering and jarring to loosen the slips.

A further object of the invention is to provide the core sections with means for supporting them from a single support and to make them self-closing in connection with said support, whereby they are more readily applied, removed and inserted in the jacket.

Another object of the invention is to provide the slip jacket with internal curvilinear faces formed on different radii of curvature from the outer face of the jacket and conforming to the arcs of the slips, whereby the entire outer surface of each slip has a full bearing on the face of the jacket and the strain is evenly distributed.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown and wherein:

Fig. 1 is a view partially in section and partially in elevation showing slips constructed in accordance with our invention,

Fig. 2 is a plan view of the same,

Fig. 3 is a view similar to Fig. 1 showing the slips lifted and the jacket disengaged,

Fig. 4 is a plan of the core with its slips open,

Fig. 5 is a bottom view of the same.

Fig. 6 is a plan view showing a modified form of jacket with the slip sectors mounted therein, and

Fig. 7 is an elevation of one of the jacket members shown in Fig. 6.

In the drawings the numeral 10 designates one section and 11, the other section of a jacket, said sections being substantially semi-circular and each having an outwardly directed flange 12. In the top of each jacket section is a screw threaded recess 13 in which eye bolts may be inserted for removing the jacket from the rotary table or other support 14.

Each section has an inclined outer wall or surface 15 and an inclined inner wall or surface 16, both surfaces being curved circumferentially. The outer walls are inclined at substantially the same pitch or degree as the wall of the socket 17 in which the jacket sections are supported. The lower edges of the jacket are provided with inner bevels 18.

Within the jacket is inserted a core or inner slip member 19 comprising three arcuate sectors having their inner walls formed with gripping teeth 20 and their outer walls 21 inclined at substantially the same degree as the walls 16 of the jacket so as to frictionally engage the latter. The sectors 19 are connected to a common support by which they may be lifted, as will be hereinafter described. It will be noted that the outer walls 15 of the sections 10 and 11 are inclined to a less degree than the inner walls 16, this gives the outer walls a wedge seat separate from the seat of the slips upon the inner walls.

When the slips are in use the jacket will be wedged in the socket 17 and the core sectors 19 will be frictionally engaged in the jacket. When the slips are lifted the contact with the socket walls will be broken prior to the contact between the jacket and core, owing to the difference between the inclination of the walls 15 and 16. After the slips have been lifted a short distance, an inch, more or less, the jacket, due to its weight will drop back into its socket as is shown in Fig. 3. When the jacket slides down the core, the sectors thereof will be freed and will thus readily release from the work and may be easily removed.

Over the sectors 19 yokes 22 are mounted. These yokes are curved to conform to the general contour of the core and are rigidly fastened on the outer sectors by bolts 23. Each yoke has a reduced tongue 24 on its inner end and these tongues overlap above the intermediate sector. Cap bolts 25 secured to the intermediate sector pass through the yokes and each yoke is pivoted on one of these bolts. The bolts 25 have heads or caps provided with eyes 26 for receiving the trunnions 27 of a bail or handle 28. On the bottom of the slip sectors 19 similar yokes 29 are fastened to the sectors by bolts 30 and are pivoted upon bolts 31.

It will be seen that the three core sectors 19 may be lifted by the bail 28 and easily handled. When the slips are held by the handle and the outer sectors allowed to swing apart, the yokes 22 will be swung as is shown in Fig. 4. On the inner end of each yoke is a boss 32. When the yokes are swung the overlapping tongues 24 are displaced so that the bosses lie on each side of the center of the slips. This is also true of the bottom yokes 29. With the slips open the bosses project, as is shown in Fig. 4, and when the slips are swung toward the pipe these bosses strike said pipe and cause the sectors to be swung to a closed position about the pipe.

In Figures 6 and 7 I have shown a modified form which is similar to the general construction shown in Figure 2, excepting the jacket which is formed of sections 10′ and 11′ is provided with a plurality of inner curvilinear surfaces or faces 16′, each taken on a different center from the outer face 16″ of the jacket which is concentric to the axial center of the slip. These faces 16′ form individual seats providing increased surface contact for the connected core sectors 19 before described. Each surface or face is curvilinear transversely on the same radius throughout its length and the contacting face 19′ of each core sector 19 is correspondingly curved, and thus the entire outer face or surface of said sector will contact with each of the internal curvilinear faces 16′. The advantage of this structure will be appreciated when the enormous strain and shock to which the parts must be subjected, is considered. Each sector contacting throughout its entire area, or the major portion thereof, with a curvilinear face, will be substantially sustained, whereby the shock will be absorbed and the strain will be evenly distributed. The interior surface 16′ of each section of the jacket is formed with faces on different radii of curvature from its outer surface to provide gripping engagement with corresponding outer faces upon the core sectors.

Various changes in the size and shape of the different parts, as well as modifications and alterations, may be made within the scope of the appended claims.

What we claim, is:

1. Compound slips comprising, a jacket having inner inclined walls, a core including a plurality of slip sectors having inclined outer walls fitting in the jacket, pivoted yokes connecting two of the sectors with an intermediate sector, the inner ends of the yokes overlapping and extended beyond their pivots to form bosses at the inner face of the intermediate sector when the sectors are opened.

2. Compound slips comprising, a jacket having inclined inner and outer walls and composed of sectors, a core fitting within the jacket and comprising a plurality of sectors, yokes rigidly attached to the outermost core sectors and pivoted to the intermediate core sector, and a handle attached to the sectors.

3. Compound slips comprising, a jacket having inclined inner and outer walls and composed of sectors, a core fitting within the jacket and comprising a plurality of sectors, yokes rigidly attached to the outermost core sectors and pivoted to the intermediate core sector, and a handle attached to sector pivots upon the intermediate sector, the inner ends of said yokes overlapping between their pivot points and being projected outwardly into the path of the work when the sectors of the core are spread apart.

4. Compound slips comprising, a jacket having inclined inner and outer walls and composed of sectors, a core fitting within the jacket and comprising a plurality of sectors having teeth on their inner faces, yokes rigidly secured to the top and bottom of the outermost core sectors and pivoted to the intermediate core sector, and a handle pivotally connected to the top of the intermediate core sector.

5. Compound slips comprising, a jacket having inclined inner and outer walls and composed of sectors, a core fitting within the jacket and comprising a plurality of sectors having teeth on their inner faces, yokes rigidly secured to the top and bottom of the outermost core sectors and pivoted to the intermediate core sector, the top yokes overlapping the intermediate core sector, and a handle pivotally connected to the intermediate core sector.

6. As a sub-combination, a plurality of elongated tapered slip sectors interiorly toothed adapted to be inserted in a tapered opening in a support and having their outer faces separately curved on different radii from the inner toothed faces of the sectors.

7. Compound slips comprising an outer jacket having a plurality of interior curvilinear faces formed on different radii of curvature from the outer face of the jacket, and a core comprising a plurality of interiorly toothed sectors having their outer faces separately curved on similar radii to seat upon the interior faces of the jacket.

8. Compound slips comprising an outer jacket having a plurality of interior curvilinear faces formed on different radii of curvature from the outer face of the jacket, and a core comprising a plurality of interiorly toothed sectors having their outer faces separately curved on similar radii to seat upon the curved interior faces of the jacket, the outer walls and the inner walls of the jacket being inclined at different degrees.

In testimony whereof we affix our signatures.

ROBERT A. WILSON.
CHARLES S. CRICKMER.