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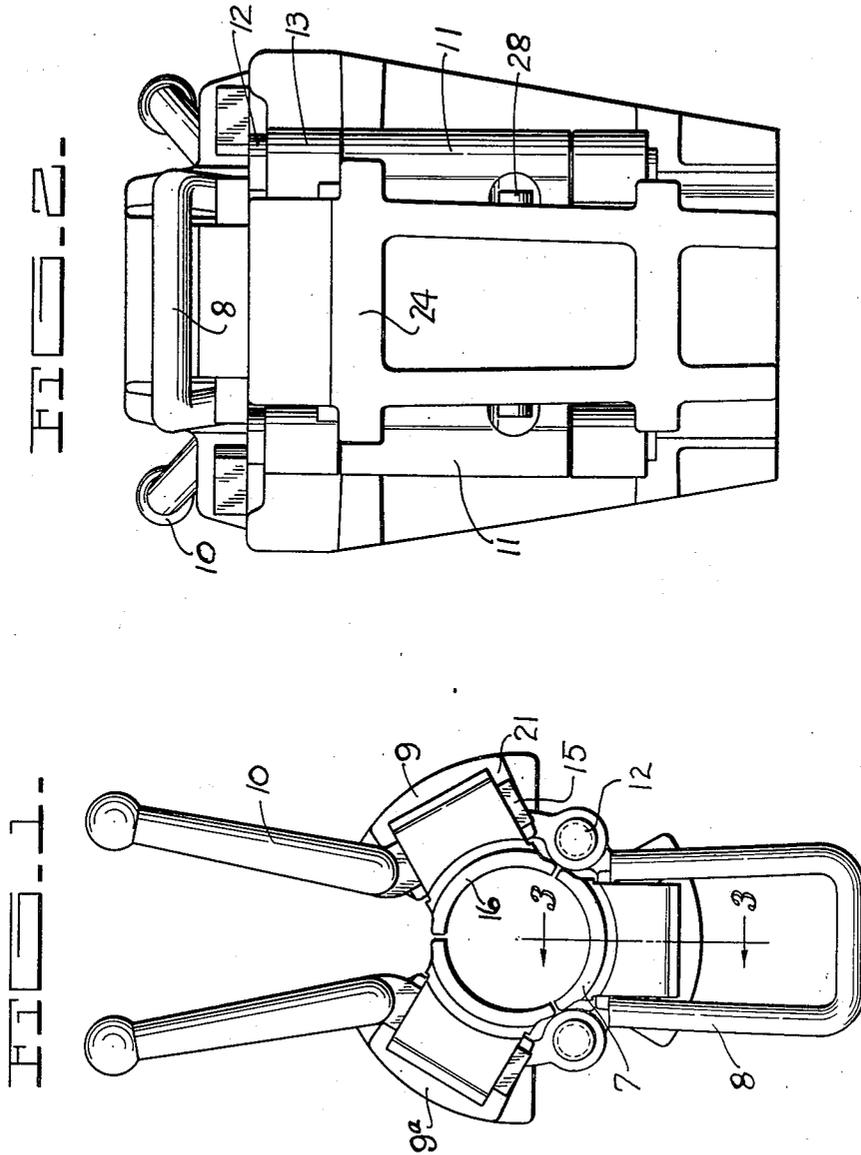
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SLIP

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SLIP

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3 Claims. (Cl. 24-263)

My invention relates to slips for use in holding pipe in wells.

It is an object of the invention to provide a pipe-engaging slip which will readily release the pipe when said pipe is drawn upwardly from its engagement with the slip.

It is another object to provide a pipe-engaging slip which will maintain a resilient hold upon the pipe regardless of the amount of weight sustained by the slip.

It is another object of the invention to provide a pipe-engaging slip made up of two longitudinal sections which will have a slight relative longitudinal movement with respect to each other so that the slips may better engage the pipe.

It is a further object to provide a set of pipe-engaging slips which are so mounted as to be easily handled to and from position in the ordinary slip bowl employed in rotaries or within the casing head at the upper end of the well.

In the drawings herewith, Fig. 1 is a top plan view of a set of slips embodying my invention,

Fig. 2 is a side elevation of the slip shown in Fig. 1.

Fig. 3 is a central longitudinal section through one of the slip jaws taken on the plane 3-3 of Fig. 1.

Figs. 4, 5 and 6 are transverse sections taken on the planes 4-4, 5-5 and 6-6 of Fig. 1, respectively.

The slips upon which my invention is employed are arranged so that a plurality of slip jaws of this character will entirely surround the pipe. I prefer to use three such jaws to enclose the pipe, it being obvious, however, that more than three may be employed. In Fig. 1 is shown a central jaw 7, to which is attached a U-shaped handle 8. There are two forward jaws 9 and 9a pivoted to the jaw 7 and equipped with forwardly extending handles 10.

As will be seen from Figs. 1 and 2, the central jaw 7 has laterally extending tubular hinge members 11 thereon which are adapted to receive a hinge pin 12, which extends downwardly therethrough and through the hinge members 13 upon the two forward jaws. A hinge is thus made between the three jaws, the two forward jaws being movable relative to the central jaw. The two forward handles have their inner ends flattened to extend through openings 14 in the two forward jaws, said flattened portion extending beyond the jaw, as shown at 15 in Fig. 1.

Each jaw is made up of an inner pipe engaging section 16, which is toothed in the usual man-

ner with upwardly inclined teeth which are adapted to engage the pipe. The inner face of each jaw is formed on the arc of the pipe which it is to engage. The outer surface of the inner section 16 is formed adjacent the upper end with an outwardly extending flange 17 through which the opening 14 is formed. Below the flange 17 the outer wall of the jaw is approximately vertical down to a point spaced somewhat from the lower end where there is an outwardly inclined shoulder 18. Below this shoulder the outer surface is tapered downwardly to accord with the taper of the slip bowl. At the outer portion of the flange 17 the outer surface is tapered at 19 to accord with the taper of the portion 20 at the lower end of the inner section.

As will be seen best from Figs. 4, 5 and 6, the outer section 21 is formed with an inner recess 22 to receive the outwardly extending portion of the inner section 16. This recess has its lateral walls parallel and the inner section is therefore allowed a sliding radial movement, telescoping within the walls of the outer section. The outer face of the section 21 is recessed somewhat at 23 to lighten the weight of the jaw and also to provide a plane surface 24 which engages the wall of the slip bowl and frictionally resists the downward movement of the pipe when the load comes upon the slip. The outer face of the inner section from below the flange 17 to the shoulder 18 is in the form of a recess. The base of this recess and the base of the recess 22 in the outer section form opposed bearing portions.

Between the inner section and the outer section of the slip there is a resilient rubber cushion member 25. This rubber is molded in the position where it is placed and is secured to the inner section through being molded within arcuate ribs 26. Said ribs extend from one side of the inner section in spaced relation from the body of the slip, as shown best in Fig. 5. There are two of these ribs, the lower rib 26a being spaced upwardly from the lower end of the slip.

In securing the outer section to the inner section of the jaw a pin 28 is passed through the two sections as shown in Fig. 6. This pin extends through the side walls of the outer section and through the rubber portion of the slip so as to tie the two sections together. I also close the space around the upper and lower ends of the chamber in which the rubber is received, the upper end being closed by a cylindrical pin 29. This pin, as seen best in Fig. 4 extends across the recess 22 and bears against the upper flange 17 which closes the upper end of the space in

which the rubber is placed and thus prevents the flowing of the rubber outwardly between the two sections, as might be the case under excessively high pressures. At the lower end of the chamber in which the rubber is placed is a rectangular stop pin 30, which also serves as a dam to prevent the passage of the rubber downwardly from the chamber under high pressures.

It will thus be seen that the slip is made up of two sections spaced apart largely by a resilient cushion of rubber. This rubber is tied to the two sections in such manner that the slip may be handled as a unit when it is inserted into or removed from the tapered bowl in which it is adapted to fit.

In the operation of the device the slip is handled in the usual manner. One operator will grasp the U-shaped handle 8 and two other operators will assist by grasping the handles 10. When the device is inserted into the tapered bowl around the pipe it will frictionally engage between the pipe and the wall of the bowl. As the pipe is lowered relative to the slip it will be engaged by the toothed surface 16 which will tend to move the inner section downwardly relative to the outer section. The outer section will engage against the wall of the bowl and will resist downward movement. There will be a heavy load compressing the cushion of rubber between the two sections and the bearing portions in the bases of the recesses take up the load and transmit it thru the rubber from the inner to the outer section. As rubber is practically incompressible it will tend to flow from the chamber in which it is placed but as this chamber is closed against the outward movement of the rubber there will be a resilient force tending to hold the two sections resiliently apart and into close engagement with the bowl and with the pipe.

When the pipe is released it will be pulled upwardly relative to the slips, thus moving with it the inner section 16. The inner section will move upwardly a slight distance sufficient to take the load off the rubber cushion, which will then force the two sections of the jaw apart and al-

low the ready release of the slip from the pipe and the bowl.

This slip has many advantages in the uniform grip which is obtained both on the pipe and the bowl, said grip being readily released when the load is removed. There will be no tendency of the slip to stick in position between the pipe and the bowl as is customary in slips of this character. The rubber cushion is protected on all sides from wear and will endure for long periods of time without the necessity of replacement.

What is claimed as new is:

1. In a pipe engaging slip construction having inner and outer sections, one of said sections having end flanges projecting toward the other section, said other section having side flanges projecting toward said first section, opposed spaced bearing portions on said sections, a body of rubber, said flanges confining such rubber between said bearing portions to transmit a load from one bearing portion to the other so that the load on the inner section is resiliently supported upon the outer section.

2. In a pipe engaging slip including an inner pipe engaging section, an outer bowl engaging section, one of said sections having end flanges projecting toward the other section, said other section having side flanges projecting toward said first section, opposed spaced bearing portions on said sections between said flanges, said opposed spaced bearing portions and said flanges forming a chamber between the sections, a body of rubber, means including said flanges confining such rubber in such chamber between said portions and said flanges so as to transmit the load from said inner to said outer section.

3. In a pipe engaging slip construction having inner and outer sections, opposed spaced bearing portions on said sections, a body of rubber between said bearing portions, means associated with one of said bearing portions to confine the rubber to transmit a load from one bearing portion to the other so that the load on the inner section is resiliently supported upon the outer section.

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