

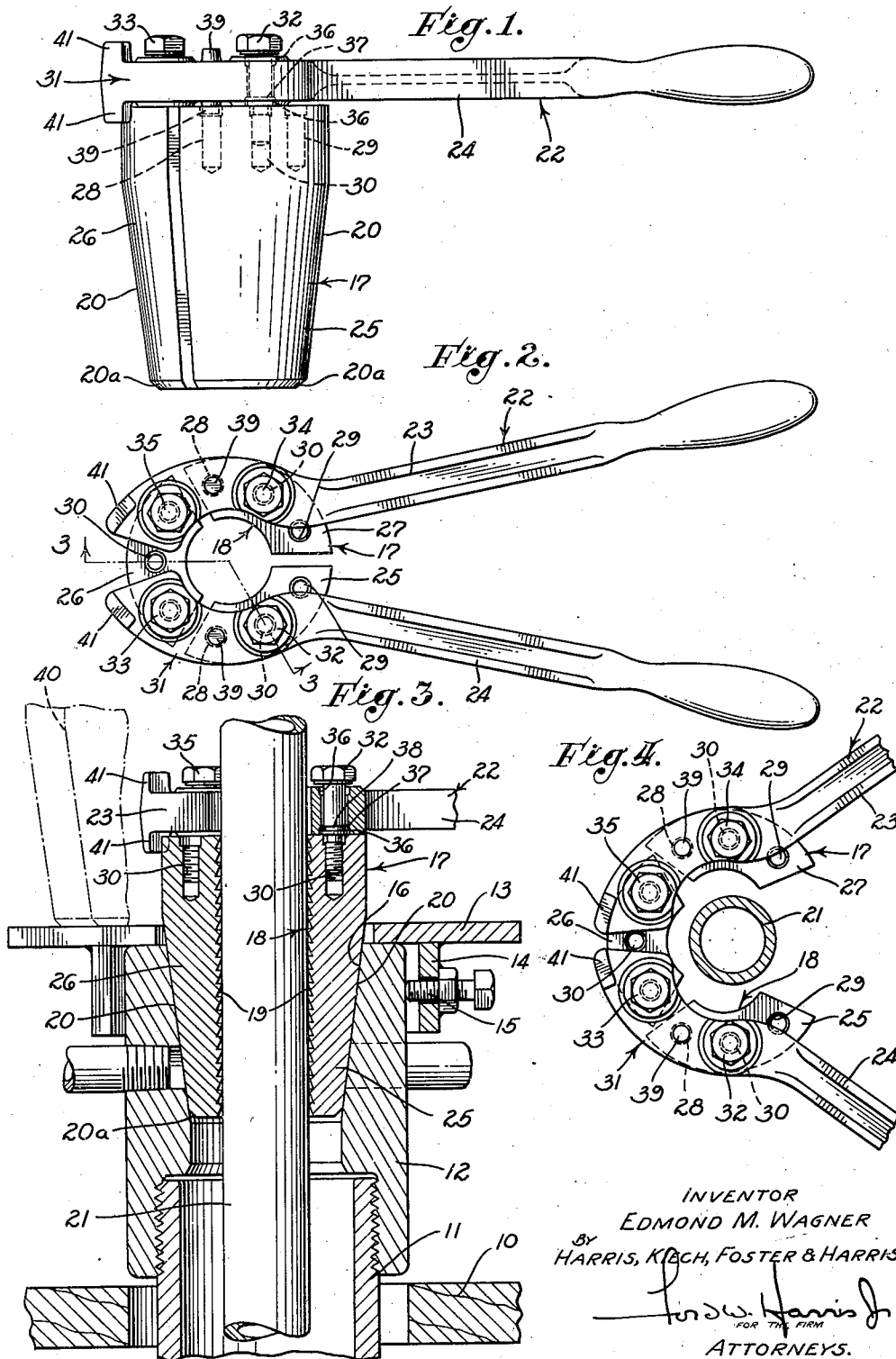
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SLIP TOOL

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SLIP TOOL

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1 Claim. (Cl. 24—263)

My invention relates to the tool art, and more particularly to a tool for setting pipe slips.

Although my invention is susceptible of a number of uses, it is of particular utility in the oil industry, and, accordingly, will be described in connection with such use, but I do not intend to be limited to such field of use.

In drilling and pumping oil wells it is a standard practice to provide a tubing head or slip holder adapted to receive slips having a serrated or threaded inner face adapted to grip and hold a section or length of pipe while further sections are attached or removed therefrom. The slips used are ordinarily of a tapered, wedge shape adapted to fit around the pipe in a conical opening in the slip holder or tubing head, and usually three such slips of arcuate form are used in the industry. The standard method of placing such slips has always been by hand, which under certain conditions becomes hazardous to the operators and equipment. For example, if a length of pipe is being lowered into a well, and it is desired to check the descent of the pipe by means of the slips, two operators are generally used, one holding one slip and the other two slips. Upon a prearranged signal they attempt to insert all of the slips into the slip holder or tubing head around the pipe at the same instant to secure a uniform, balanced gripping action of the slips on the pipe. In practice, however, it is extremely difficult for two operators to time their respective slip inserting operations so as to provide a simultaneous setting of the slips, and it frequently occurs that one operator will set his slips materially before the other, which results in the pipe which is being lowered being thrown to one side of the well. This spoils the alignment of the pipe in the center of the well, and, as a consequence, the pipe must be raised until the slips are free to permit an attempted resetting of the slips, thus occasioning delay and attendant extra expense in the well operations. Furthermore, it sometimes happens that as a result of one operator failing to set his slips simultaneously with those of the other, the pipe will not be securely retained and will slip on through into the well, thus causing an expensive and troublesome fishing operation to retrieve the length of pipe from the well. It also frequently occurs that if one slip is set by the hand method before the others, it may bite substantially into the pipe, which is always undesirable.

It is a primary object of my invention to provide a tool for holding a plurality of slips so that they can be set simultaneously around a pipe

being run into a well, to obviate the foregoing stated difficulties in setting such slips.

In practice, since the pipe supported on the slips held in a slip holder or tubing head may be of great length and thus having great weight, the serrations or threads on the inner faces of the slips may become embedded in the walls of the pipe to such an extent that when the pipe is raised in the well the slips will adhere to it for a few seconds at least, and either ride up with the pipe or fall off on the derrick floor, thus causing additional work by the operators to retrieve the slips and prepare them in readiness for subsequent resetting. Consequently, it is a further object of my invention to provide a device whereby a plurality of slips may be simply and positively removed from a section of pipe and still retain them in readiness for resetting when desired.

Another object of my invention is to provide a device of the character described which can be operated by a single man, thus reducing the labor required in setting and removing the slips. I prefer to accomplish this by the construction hereinafter described, in which the weight of the tool with the slips attached is kept at a minimum to provide ease in handling by a single operator.

Another object of my invention is to provide a tool as herein described including handles which are carefully balanced in weight so that the tool will support itself in a position for ready operation without external support.

Still another object of my invention is to provide a tool holder including a pair of handles which are fully reversible.

Other objects and advantages will be apparent from the following specification and drawing, which is for the purpose of illustration only, and in which:

Fig. 1 is a side elevational view of my invention.

Fig. 2 is a plan view of the construction shown in Fig. 1.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a plan view similar to Fig. 2, showing the invention in open position.

Referring to the drawing, and particularly Fig. 3 thereof, I show a derrick floor 10 through which upwardly projects the upper end of a well casing 11 having threadedly secured thereto a tubing head 12, as is well known in the art. Resting on the tubing head 12 is a slip table 13, preferably of annular form, although any form desired may be used, having an annular flange 14, and being rigidly secured to the tubing head

by means of suitable bolts 15 threaded through the flange and engaging the tubing head.

The tubing head 12 is provided with a central conical bore 16 adapted to receive a plurality of slips 17 therein. As shown in Fig. 2, the slips 17 are preferably arcuate in form, and preferably three in number are used. The slips 17 are provided with vertical inner faces 18 having serrations or threads 19 thereon, the outer surface of each of the slips having an inwardly beveled portion 20 adapted to conform to the taper of the conical bore 16 of the tubing head 12, the outer lower edge of the slips having a bevel 20a to assist in initially introducing the slips into the conical bore. In Figs. 3 and 4 a section of pipe 21 is shown extending upwardly between the slips 17 and through the casing head 12.

Adapted to be secured to the slips 17 is a holding means 22 comprised of a pair of handle members 23 and 24. The three slips 17 shown in Figs. 2 and 4 are designated for convenience in description as 25, 26, and 27, all being identical in construction and each being provided with tapped vertical end bores 28 and 29 and a central tapped vertical bore 30 between the bores 28 and 29. The handle member 24 is provided with a substantially flat inner arcuate end 31 forming a head on the handle member 24 in which are provided suitable openings through which bolts 32 and 33 are passed, the bolt 32 being threaded into the central vertical bore 30 of the slip 25, and the bolt 33 being threaded similarly into one end bore of the slip 26. The handle member 23 is similarly provided with suitable openings through which bolts 34 and 35 pass and are threaded into a central vertical bore of the slip 27 and the other end bore of the slip 26, respectively. The openings in the handle members 23 and 24 through which the bolts 32, 33, 34, and 35 pass, as shown in Fig. 3, each provide considerable clearance between the bolts and the sides of the openings, and each opening is provided with upper and lower counterbores 36, in the lower one of which is engaged a snap ring 37 contained in an annular groove 38 in each of the bolts. The snap rings 37 provide means whereby the bolts may be prevented from falling out of their respective handle members when unscrewed from the slips 17. Each of the handles is also provided with vertically aligned upper and lower lugs 39, and, as shown in the drawing, the lower lugs 39 fit loosely into the end bores 28 of the slips 25 and 27 to act as aligning stops for the slips 25 and 27 relative to the handles 23 and 24. Also provided on the ends of the handles 23 and 24 are upper and lower stop lugs 41, the lower pair of which engage the slip 26 as shown in Fig. 4 to limit the degree of opening of the handles so as to prevent direct engagement between the slips. Thus, it will be understood that the handles 23 and 24 are in all respects identical on their upper and lower surfaces and with each other, and thus are fully reversible and interchangeable, which is a feature of the invention. It is also to be noted the handles 23 and 24 are fully balanced in their distribution of weight, so that when attached to the slips 17 the unitary construction may be rested on the slip table 13 without any external support, thus rendering the construction immediately available for use by an operator. It is further to be noted that by my construction the slips may be made of minimum weight without loss of strength, since the handles 23 and 24 are attached directly to the slips 17,

thus rendering it possible for a single operator to handle the unit with ease.

When the holding means 22 is attached to the slips 17, as shown in the drawing, it will be noted that there is considerable space between each of the slip members when the handle members 23 and 24 are in closed position as shown in Fig. 2. This, together with the loose connection between the handle members 23 and 24 with the slips 17, provides an articulated construction in which the slip members may be spread apart to the position shown in Fig. 4, which is the open position of the holding means 22, in which the holding means with the attached slips may be passed around or away from the pipe 21 and in which the slips may individually move small amounts relative to the handles 23 and 24 to align themselves properly with the pipe 21.

In operation, the parts of the device are first adjusted to the open position shown in Fig. 4 and passed around the pipe 21 as indicated therein. Pending use, the holding means 22 with the slips 17 attached may be rested in their open position on the slip table 13, as indicated by dotted lines 40. When it is desired to set the slips 17 to support the pipe 21 in the casing head 12, a single operator merely grasps each of the handle members 23 and 24 and brings the same together to the position shown in Fig. 2 until the slips 17 firmly engage the pipe 21, upon which the downward movement of the pipe 21 will cause the slips 17 to move downwardly therewith into the central conical bore 16 of the casing head 12 until the beveled portions 20 of the slips firmly engage the walls of the bore, the threads 19 biting into the pipe 21 by the wedge action of the beveled portions of the slips in the conical bore, thus securely holding and supporting the pipe 21 in the casing head 12. Since the slips 17 are all in the same plane relative to the pipe 21, the setting operation will automatically simultaneously set all of the slips by exactly the same amount. The bevel 20a on the lower outer edge of the slips 17 insures that all or any of the slips may be started downwardly into the conical bore 16 regardless of the alignment of the pipe 21 in the conical bore.

When it is desired to remove the slips 17 from their set position shown in Fig. 3, upon raising the pipe 21, an operator may grasp the handle members 23 and 24 and as the pipe 21 is raised move the handle members apart to the position shown in Fig. 4, which simultaneously disengages all of the slips 17 from the pipe 21. The holding means 22 with the attached slips 17 may then be again rested on the slip table 13, as indicated by dotted lines 40, until further resetting of the slips is required when the process of setting may be repeated. As will be noted, all of the slips 17 are identical in construction, and are thus fully interchangeable as desired.

It will thus be appreciated that with the construction shown in the drawing and described above, a plurality of slips may be set to hold the pipe, or may be removed therefrom simultaneously by a single operator and be ready at all times for immediate and convenient use.

Although I have herein shown and described my invention in simple and practical form, it is to be recognized that certain parts or elements thereof are representative of other parts, elements, or mechanisms which may be used in substantially the same manner to accomplish substantially the same results; therefore, it is to be understood that the invention is not to be limited

to the details disclosed herein but is to be accorded the full scope of the following claim.

I claim as my invention:

In a slip holding device adapted to hold a slip, the combination of: a relatively long handle having a substantially arcuate flat head; means for loosely connecting said head to a pair of slips so as to provide an articulated connection between said slips and between said slips and said head; and stop means on said head for limiting move- 10

ment of said slips relative to each other and relative to said head, said stop means including a first lug projecting upwardly from said head and a second lug projecting downwardly from said head, said second lug being adapted to engage one of said slips, said handle being reversible so as to permit said first lug to engage said one of said slips.

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