May 14, 1929. H. F. SMITH 1,713,150

ANCHOR FOR PIPES IN WELLS

Filed April 26, 1927

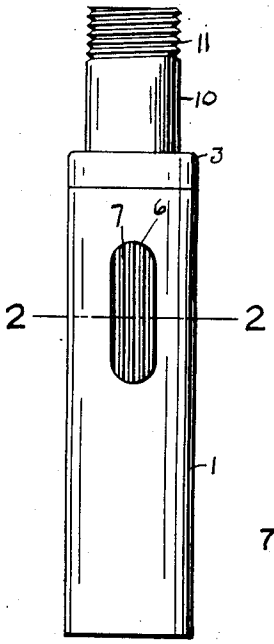


Fig 1

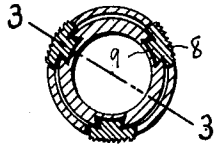


Fig 2

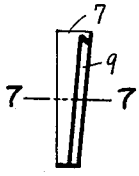


Fig 6

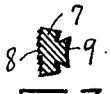


Fig 7

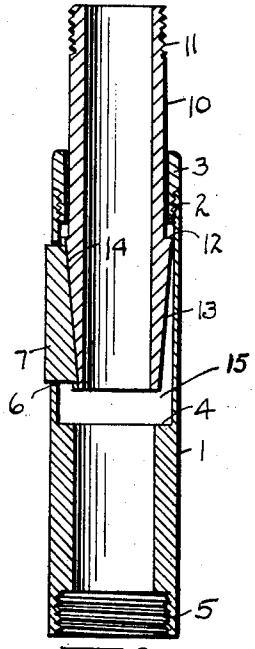


Fig 3

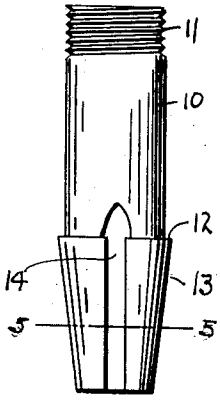


Fig 4

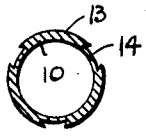


Fig 5

Howard F. Smith Inventor

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Patented May 14, 1929. 1,713,150

UNITED STATES PATENT OFFICE.

HOWARD F. SMITH, OF HOUSTON, TEXAS.

ANCHOR FOR PIPES IN WELLS.

Application filed April 26, 1927. Serial No. 186,805.

My invention relates to anchors to be employed on screen, tubing and other pipe extending into the well casing and adapted to hold the pipe from rotation within the casing.

In setting packers and in other similar operations in deep wells, it is desirable to hold the pipe upon which the packer is located from rotation within the well while the packer is being set, and it is an object of the invention to provide means located upon the pipe itself for engagement with the casing and capable of expansion to grip the casing, resisting rotation of the pipe therein.

It is an object to provide a gripping means to hold the pipe non-rotatably relative to the casing which will be expanded into gripping position by a downward movement of the pipe. It is also desired that the gripping means be released and withdrawn from the position engaging the casing by the upward movement of the pipe.

Referring to the drawing herewith wherein a preferred embodiment of the invention is disclosed, Fig. 1 is a side elevation of an anchoring means embodying my invention. Fig. 2 is a transverse section thereof on the plane 2—2 of Fig. 1. Fig. 3 is a vertical section taken on the plane 3—3 of Fig. 2. Fig. 4 is a side elevation of the expanding mandrel. Fig. 5 is a transverse section on the plane 5—5 of Fig. 4. Fig. 6 is a side elevation of one of the jaws; and Fig. 7 is a transverse section of the jaw taken on the plane 7—7 of Fig. 6.

My invention is adapted particularly for use in holding the lower end of a pipe, such as a well screen, non-rotatably within the casing while a packer is being expanded above the screen. A type of packer which is very commonly used is so constructed as to be released and expanded by a screwing motion of the setting pipe relative to the screen, and in order to hold the screen from rotation while the pipe above is being screwed down and released for expanding the packer, my anchor is adapted to be placed adjacent the screen below the packer.

The body of the anchor comprises a tubular housing 1 made up of a short length of pipe of approximately the same diameter as the screen to which it is to be attached. The lower end of the housing is threaded at 5 to engage with the screen or perforated pipe. At the upper end of the housing the walls thereof are decreased in thickness to provide a chamber 15, and at the upper end of the chamber a collar 3 is secured. Said collar projects inwardly to provide a lower shoulder 2.

The walls of the chamber 15 are formed with a plurality of openings 6 therein within which are jaws 7, shaped to fit said openings and slidable radially therein. The outer faces of said jaws are toothed as shown at 8, said teeth being inclined in a direction to engage the pipe when said pipe is rotated in a right-hand direction. The inner sides of the jaws 7 are tapered upwardly and have thereon a dovetailed tenon 7 to fit within the groove 14 upon a mandrel 10.

The mandrel 10 has a lower head 13 thereon tapered downwardly and adapted to fit within the chamber 15. The head 13 has an upper shoulder 12 adapted to engage the lower end of the shoulder 2 on the housing and be thereby limited in its movement upwardly. The lower end of the mandrel is limited in its downward movement by the shoulder 4 at the lower end of the chamber. The mandrel has, therefore, a limited movement in both directions to advance and withdraw the jaws 7 from the opening 6 in the housing. The upper portion of the mandrel 10 is threaded at 11 to engage with a drill stem or other setting pipe and is slidable within the collar 3 at the upper end of the housing.

It will be noted that the engagement between the jaws and the mandrel is such that said jaws will be positively advanced on the downward movement of the mandrel in the housing and will be also positively withdrawn on the upward movement of the mandrel in the housing. It is contemplated that there will be sufficient pipe below the anchor to engage the bottom of the hole and place the anchor at the desired position in the well. After the length of pipe below the anchor has engaged the bottom of the well, the downward pressure of the pipe above the mandrel will force said mandrel downwardly to expand the jaws 7 into contact with the casing and the weight of the pipe will be sufficient to hold said jaws rigidly in contact with the casing outside the anchor so that when the pipe connected with the packer above is rotated in the usual right-hand direction, the teeth 8 on the jaws will positively resist movement of the anchor within the casing. The packer setting device will thus be unscrewed in the usual manner so as to set the packer.

If the packer is to be withdrawn from the

well, it will be obvious that an unscrewing movement on the packer may be employed to contract the same so that it may be removed and when this is done, an upward pull upon the mandrel 10 will withdraw the jaws 7 from their grip upon the casing and enable the anchor to be withdrawn without difficulty.

The advantages of this construction will be apparent without further description.

What I claim as new and desire to protect by Letters Patent is:

In a device of the character described, a tubular housing having a chamber with spaced radial openings therein, shoulders at the upper and lower ends of said chamber, a mandrel having an upper stem and a head rigidly connected therewith, said head fitting within said chamber and movable between said shoulders, toothed jaws slidable radially in said chamber and adapted to be engaged by said mandrel to be advanced or withdrawn from said openings thereby, the movement of said mandrel being limited by the contact of said head with said shoulders.

In testimony whereof I hereunto affix my signature this 24 day of April, A. D. 1927.

HOWARD F. SMITH.