

Aug. 30, 1932.

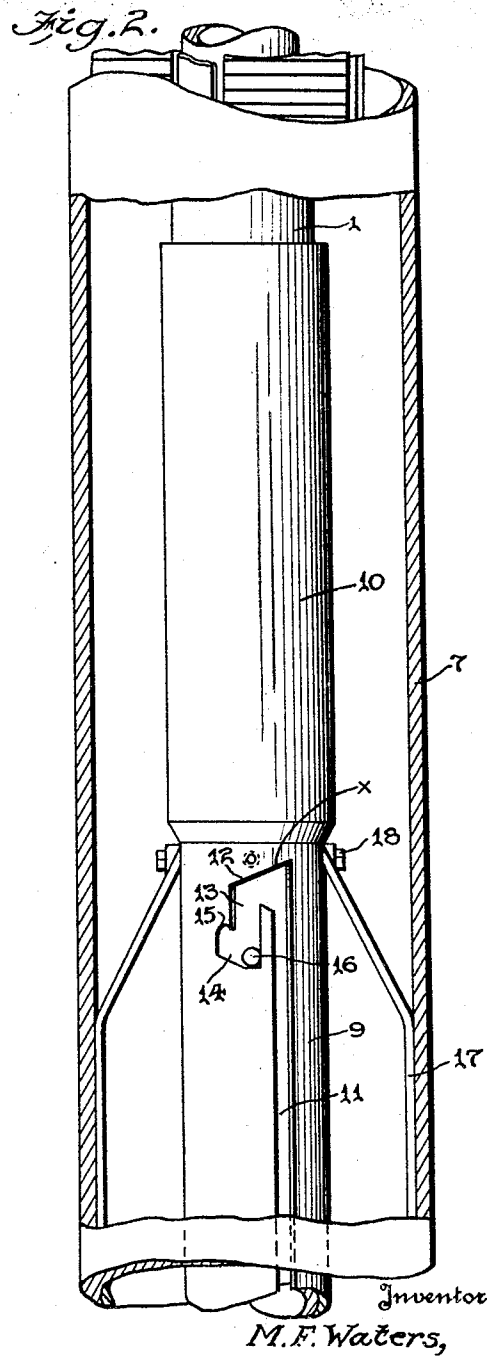
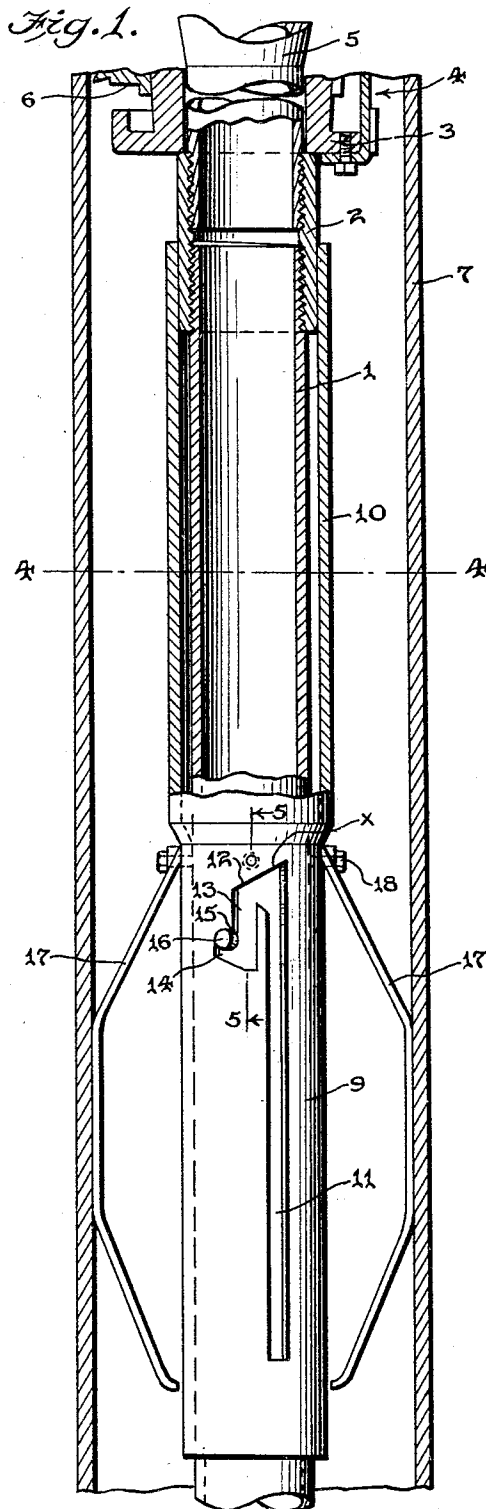
M. F. WATERS

1,874,673

TUBING CATCHER STOP

Filed Feb. 10, 1931

2 Sheets-Sheet 1



Inventor
M. F. Waters,

By

Prevost & Prevost

Attorneys

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2 Sheets-Sheet 2

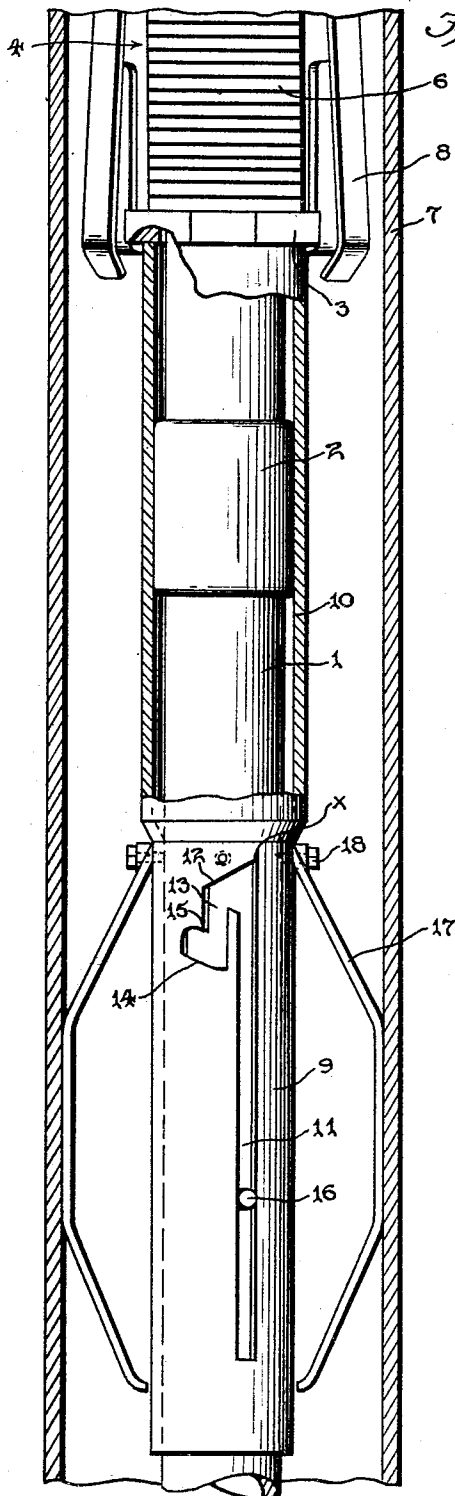


Fig. 3.

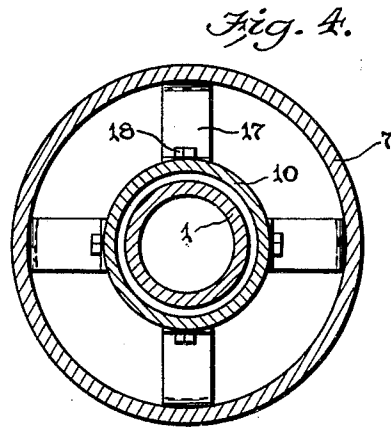


Fig. 4.

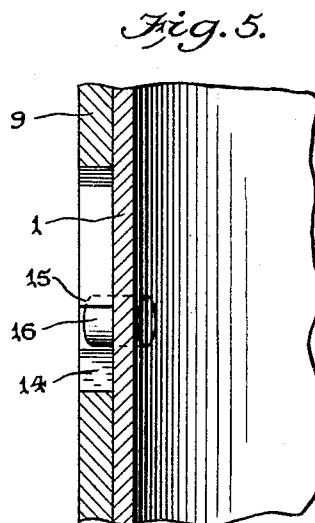


Fig. 5.

Inventor
M. F. Waters,

By *Prevost & Prevost*

Attorney

UNITED STATES PATENT OFFICE

MILLARD F. WATERS, OF TULSA, OKLAHOMA, ASSIGNOR TO HANLON-WATERS, INC., OF TULSA, OKLAHOMA

TUBING CATCHER STOP

Application filed February 10, 1931. Serial No. 514,856.

My invention consists in new and useful improvements in a tubing catcher stop or setting device and is particularly adapted for use in connection with a tubing catcher of the type employing a slip carriage slidably mounted on a section of tubing carrying a tapered mandrel or the like, wherein the relative movement of the mandrel within the carriage expands the slips into engagement with the well casing, said carriage normally resting upon a collar provided on the well tubing to support the slips in inoperative position.

The object of my invention is to provide a tubing catcher setting device which will remain in an inoperative position while the string of tubing is being lowered into a well casing but which by a slight turn of the tubing may be brought into operative engagement with the slip carriage of a tubing catcher to halt or retard the relative downward movement of said carriage with respect to the mandrel carried by the tubing, whereby when a predetermined depth is reached in the casing, the wedge slips or gripping members of the tubing catcher may be brought into engagement with the well casing.

Another object of my invention is to provide a novel arrangement for normally retaining the stop or setting device in inoperative position during the lowering of a string of tubing into a casing.

With the above and other objects in view which will appear as the description proceeds, my invention consists in the novel features herein set forth, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

Referring to the drawings in which numerals of like character designate similar parts throughout the several views,

Fig. 1 is a view partially in side elevation and partially in section showing the tubing catcher stop in inoperative position, the lower portion of the tubing catcher slip carriage being shown in section.

Fig. 2 is a view similar to Fig. 1 but with the tubing slightly turned in counter-clockwise direction, and intermediate position as-

sumed when the device is about to be brought into function.

Fig. 3 is a further view similar to Fig. 1 showing the tubing catcher stop in operative engagement with the tubing catcher slip carriage.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1, and

Fig. 5 is an enlarged sectional view taken on line 5—5 of Fig. 1 showing the slot arrangement for retaining the tubing catcher stop in normally inoperative position.

In the drawings, 1 represents a string of well tubing, the various sections of which are secured together by collars or couplings 2 which are also adapted to serve as supports for the slip carriage 3 of a tubing catcher 4, said carriage being slidably mounted on a mandrel 5. As before stated, this tubing catcher 4 is of the type wherein the relative downward movement of the mandrel 5 with respect to the carriage 3 causes the tubing catcher slips 6 to be spread into gripping engagement with the well casing 7, the downward movement of said carriage being normally retarded by the conventional spring strips 8 which frictionally engage the inner walls of the casing 7.

My improved tubing catcher stop or setting device comprises an elongated cylindrical body portion 9 which encircles and slidably engages the tubing 1 below the collar 2, the upper portion of said body portion forming an upwardly extending sleeve 10 of sufficiently larger diameter than the main body 9 to encircle and slidably engage the collar 2, the remainder of said sleeve 10 being spaced apart from the tube 1, whereby relative longitudinal movement of the collar 2 and with it the tubing 1 is permitted within said sleeve.

The body portion 9 is provided with a longitudinally extending elongated slot 11 which extends substantially the entire length of said body portion, the upper end of said slot being inclined downwardly toward one side as at 12 and merging into a second shorter slot 13. This second slot also extends longitudinally of the body 9 along the upper portion of the elongated slot 11, and terminates at its lower extremity in a substantially

transverse continuation slot 14, the lower boundary of which is slightly upwardly inclined away from the vertical arm of the slot 13. The upper side of the slot 14 is provided with a recess or hook-shaped portion 15 adapted to normally engage a transversely projecting pin or lug 16 secured to the tubing 1, said pin being adapted to travel the course of said adjoining slots to control the function of the tubing catcher stop as herein-
after set forth.

17 represents a plurality of bowed spring strips, the upper ends of which are secured by bolts or other suitable means 18 to the body portion 9 of the tubing catcher stop, their lower ends being free and the bowed portions being under a normally outward tension to frictionally engage the inner walls of the casing 7, whereby the downward movement of said tubing catcher stop is retarded.

Having thus described the construction of my improved tubing catcher stop and the general structure and operation of the type of tubing catcher with which it is particularly adapted to be used, its operation is as follows:—

Assuming that a series of tubing catchers are assembled on a string of well tubing, with a tubing catcher stop secured in place anterior to each tubing catcher, in the position shown in Fig. 1. That is, with the pin or lug 16 lying in the transverse slot 14, the hook-shaped recess 15 supporting the stop on the pin 16, thereby preventing said stop from sliding down beyond a predetermined point on the tubing while the string of tubing is hanging in the derrick.

As the string of tubing is lowered into the well casing, the downward movement of the tubing catcher stop is retarded by the frictional engagement of the spring strips 17 with the inner walls of the casing 7, but it is forced downwardly ahead of the tubing catcher 4 by the engagement of the pin 16 with the lower side of the transverse slot 14. Normally during the lowering operation, the sleeve 10 of the tubing catcher stop extends upwardly around the tubing collar 2 to a point substantially midway of its vertical extremities as shown in Fig. 1, thus being spaced apart from the slip carriage 3 which is supported on the upper edge of said collar, in inoperative position.

This tubing catcher stop in no way interferes with the function of the tubing catcher in the event of an accident such as a parting of the well tubing and is only brought into play when the desired depth in the well casing is reached, or if for any reason the operator desires to stop the tubing at any point in the casing.

At such point, a slight turn of the tubing in counter-clockwise direction brings the pin 16 into the vertical arm of the slot 13, (Fig. 2) and by a slight upward strain on the tubing

and continued counter-clockwise rotation, the pin 16 comes into engagement with the inclined common upper extremity of the slots 13 and 11 respectively which, due to the angle in inclination, causes the pin 16 to reach the point X in the extreme upper end of the slot 11. The string of tubing is then again permitted to descend, the pin 16 sliding in the elongated slot 11 as shown in Fig. 3, the tubing catcher stop remaining stationary due to the frictional contact of the springs 17 with the casing 7.

Thus, as the tubing descends through the body portion 9, the collar 2 likewise descends in the sleeve 10, thereby bringing the slip carriage 3 of the tubing catcher 4 into abutment with the upper extremity of the sleeve 10, preventing the further downward movement of the slip carriage. The continued downward movement of the string of tubing then brings the mandrel 5 into expanding engagement with the slips 6 supported in the carriage 3 thereby causing said slips to grip the inner walls of the well casing and lock the string of tubing in place therein.

If the operator now finds it necessary to go further down into the well with the tubing, he unlocks the tubing catcher stop and again places it in inoperative position, by simply elevating the tubing and with it the pin 16 in the slot 11 and when said pin has reached the uppermost point in said slot, a slight turn of the tubing in clockwise direction brings the pin into the vertical arm or slot 13. The tubing is then permitted to descend a slight distance until the pin reaches the lower end of the slot 13, when a further turn of the tubing in clockwise direction brings the pin into the transverse arm or slot 14 which retains the tubing catcher stop in a non-functioning position. The tubing catcher slips having been disengaged from the casing by the upward movement of the tubing, the slip carriage 3 again rests upon the upper edge of the collar 2 and the apparatus is again in a position to be lowered further into the well.

It will thus be seen that I have provided a novel device for use in setting a tubing catcher, which is simple in structure and operation and extremely economical to manufacture, and furthermore obviously accurate in its function.

From the foregoing it is believed that the objects and advantages of my improved tubing catcher stop may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details of construction without departing from the spirit of the invention as set forth in the following claims.

What I claim and desire to secure by Letters Patent is:—

1. In combination with a string of well

tubing, a tubing catcher mounted on said tubing, a member on the tubing for supporting said tubing catcher in inoperative position, a tubing catcher setting device comprising a
5 cylindrical body portion slidably embracing said tubing below said supporting member, the upper extremity of said body portion terminating in an enlarged sleeve adapted to slidably embrace said supporting member,
10 means for locking said body portion against longitudinal movement on said tubing, whereby the upper extremity of said enlarged sleeve is normally positioned below the upper extremity of said supporting member and out
15 of contact with said tubing catcher, and means for retarding the downward movement of said body portion in a well casing, said sleeve, when the locking means is released, being adapted to operatively engage
20 said tubing catcher upon the downward movement of the string of tubing.

2. Apparatus as claimed in claim 1 wherein said locking means comprises a bayonet slot in said body portion and a pin rigidly
25 secured to said tubing and extending through said slot, the upper extremity of said slot terminating in an angular surface inclined upwardly away from said pin when the latter is in locked position, substantially as described.
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In testimony whereof I affix my signature.
MILLARD F. WATERS.

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