

S. A. GUIBERSON, JR.
WELL TUBING SAFETY APPLIANCE.
APPLICATION FILED DEC. 20, 1911.

1,030,084.

Patented June 18, 1912.

2 SHEETS SHEET 1.

Fig 1

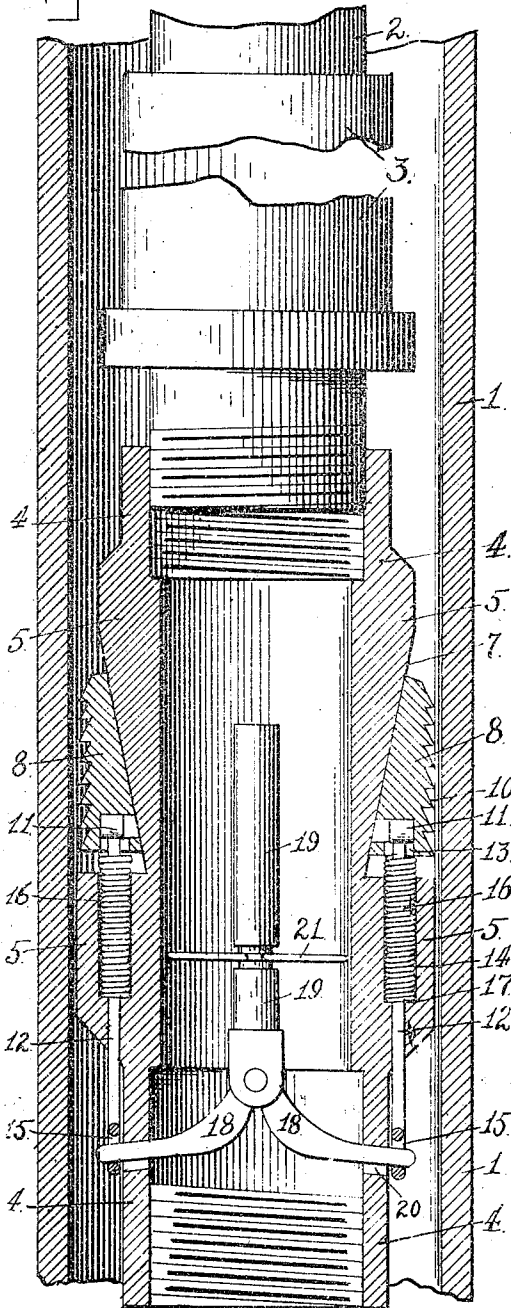
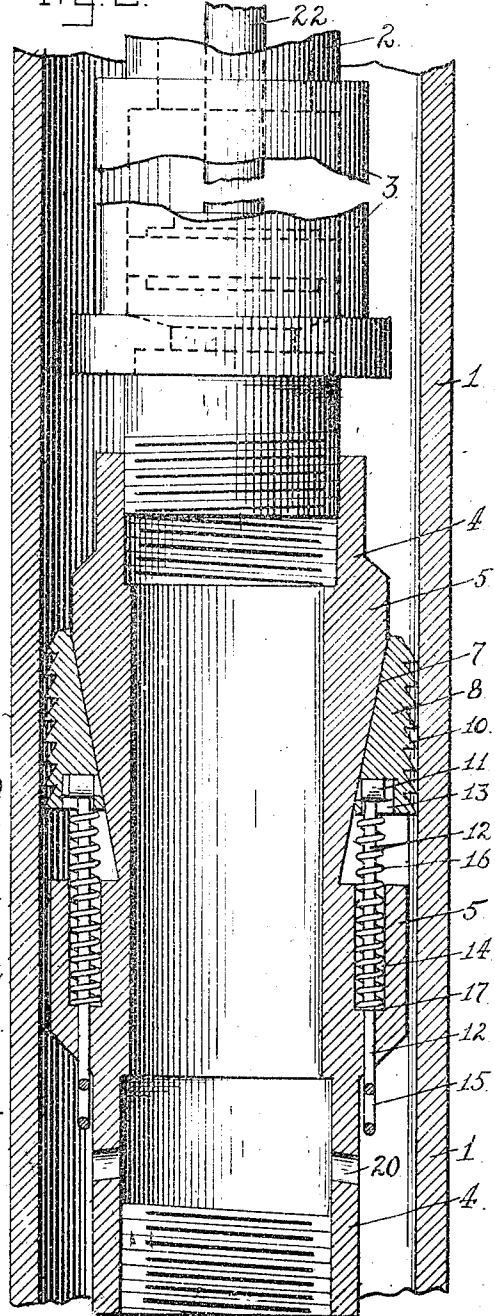


Fig. 2



Witnesses

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2 SHEETS-SHEET 2.

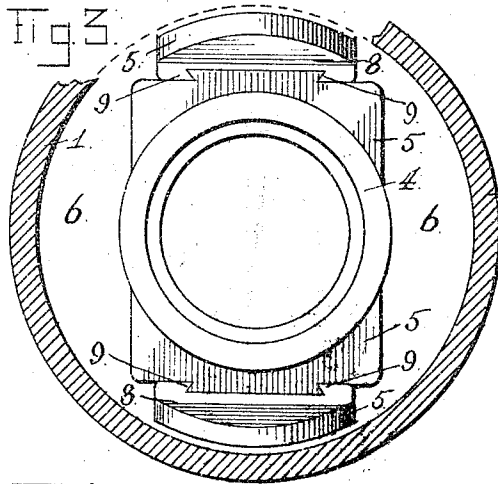


Fig. 5.

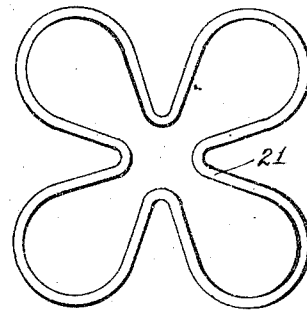


Fig. 4.

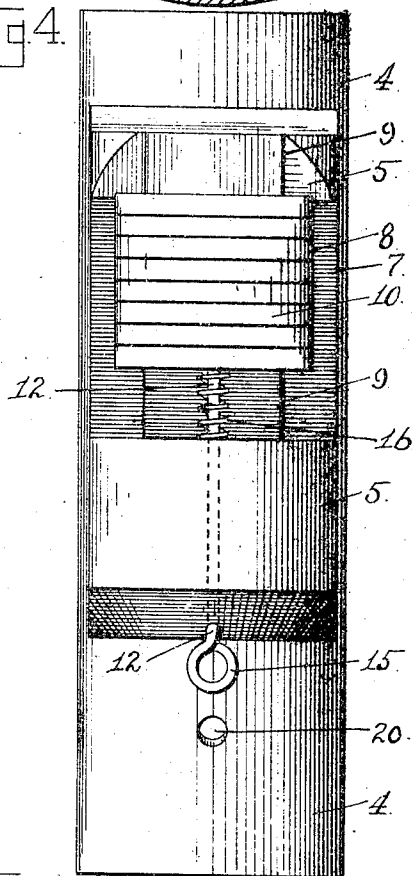
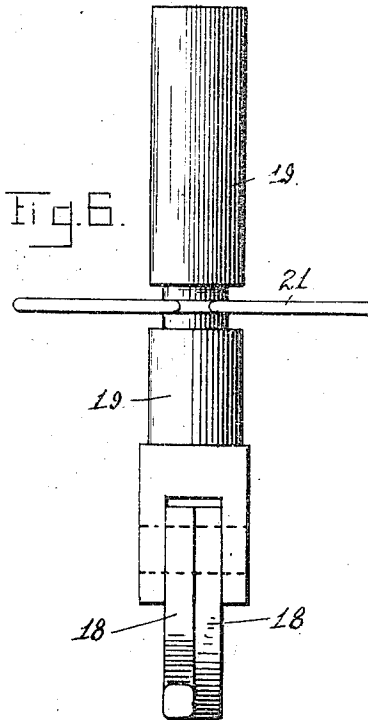


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL ALLEN GUIBERSON, JR., OF COALINGA, CALIFORNIA.

WELL-TUBING SAFETY APPLIANCE.

1,030,084.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed December 20, 1911. Serial No. 666,949.

To all whom it may concern:

Be it known that I, SAMUEL ALLEN GUIBERSON, JR., a citizen of the United States, residing at Coalinga, in the county of Fresno and State of California, have invented certain new and useful Improvements in Well-Tubing Safety Appliances, of which the following is a specification.

My invention relates to well-pumping apparatus and particularly to means for guarding against the injury and loss which follow the unintentional dropping of the tubing, due to breakage or to any other cause.

My invention consists in the novel safety appliance which I shall hereinafter fully describe.

The object of the invention is to afford a simple and effective clutch device for the tubing to prevent it from dropping, said device being such as not to interfere with the lifting of the tubing out of the casing, and also as not to interfere with the free passage of the sand which enters the casing with the oil.

Referring to the accompanying drawings—Figure 1 is a vertical sectional view showing my safety-appliance in position ready to be released, so that it may assume a position of what I may term "functional readiness." Fig. 2 is a similar view showing it in its position of functional readiness, that is, a position in which, when the occasion arises, it will perform its intended function. Fig. 3 is a top plan view of the appliance, the casing being in horizontal cross section. Fig. 4 is an elevation of the device. Fig. 5 is a plan of the bendable guide 21. Fig. 6 is an edge elevation of the locking and tripping device.

1 is the well casing.

2 is the tubing, and 3 is the pump barrel.

Connected with the lower end of the pump barrel is the tubular stock 4 of the safety-appliance. The exterior of the stock is formed with bosses 5 on opposite sides, so that the stock has two diameters, namely, a longer one through the bosses, which diameter is such as to cause the stock to somewhat nicely fit the casing 1 on two sides, and the other diameter, a shorter one through said stock at right angles to the longer diameter, thereby leaving channels indicated at 6 in Fig. 3, between said stock 5 and the casing walls, which channels per-

mit the free passage of the sand which heaves up in the casing.

In each boss 5 is made a seat 7 for a gripper slip 8. The seat is an inclined plane deepening downward, and the connection of the slip with its seat, though it may be of any nature adapting it to slide, is best made as a dovetail slip joint, as indicated at 9. The outer face of the slip 8 may be of any suitable character, but in practice it is best made with teeth 10 which give a biting contact. The relation of the inclined plane seats 7 and the gripper slips 8 is such that when the latter are moved down close to the foot of the seats the faces of said slips will lie safely inside of the circumference of the faces of the bosses, as seen in Fig. 1, so that in this position the device may be freely lowered into the casing. But as the slips move upward on their inclined plane seats their faces will reach the circumference of the boss faces and beyond said circumference and will lie against the inner wall of the casing, as seen in Fig. 2. Any pressure downward on the stock 4 will thereafter tend to cause the slips 8 to rise still further, in which endeavor they will obviously grip the casing with a bite the strength of which is proportionate to the pressure downward.

In order to preliminarily lock the gripper slips in their non-functional position, so that the device may be lowered into the casing, and then to release or trip them, to place them in operative position or functional readiness, I have the following trip lock which in this connection I deem particularly effective.

In a socket in the base of each gripper slip 8 is seated freely a nut 11 with which the threaded upper end of a holding rod 12 engages, said upper end passing freely into the slip through an elongated slot 13 so that the rod can adjust itself, together with the freely seated nut 11, to the longitudinally inclined movement of the slip. The rod 12 passes through a hole 14 in the boss 5 and has an eye 15 on its end. A spring 16 seated around the rod and bearing between a shoulder 17 in the hole 14 of the boss 5 and the base of the gripper slip, serves to throw the slip up to functional readiness.

Within the stock 4 of the appliance are two trip arms 18, the inner ends of which are pivotally connected with a head stem 19.

and their outer ends are adapted to project through holes 20 in the stock 4 and to engage the eyes 15 of the slip holding rods 12. The trip arm head stem 19 extends upward a short distance and it has fitted to it a guide 21, which by contact with the walls of the stock 4 holds the head stem central and in proper position to be engaged by the coupling device of the wire line presently to be mentioned. This guide 21 should be of a bendable nature, in order that it may, when the locking device is being drawn up, pass through the pump barrel and tubing, which are of smaller diameter than the diameter of the stock. For this purpose I deem a frame work, as here shown, made of bendable wire, as a good construction for the guide.

A description of the use and operation of the safety appliance will give a full understanding of the invention. The safety-appliance is first set in its primary inoperative condition, in which, as seen in Fig. 1, the gripper slips 8 are held down to their lower limits by the engagement of the trip arms 18 with the eyes 15 of the rods 12. In this position, as before stated, the faces of the slips 8 do not project from the faces of the stock bosses 5, so that the device may pass down into the casing. The stock 4 being now connected with the lower end of the pump barrel 3, and the latter being connected with the tubing 2, all these parts are lowered into the casing to the point desired and are supported in proper manner. Now before the pump piston and its sucker rods are dropped down through the tubing, it is the intention to trip the safety appliance, so that its slips may move to a position of functional readiness.

Any suitable means of reaching the head stem 19 of the trip arms 18 may be employed. The way I propose is by the wire sand-line with a common sucker rod socket on its lower end. This is dropped down until it engages the upper end of the head stem 19 of the trip arms 18. Then by a pull on the wire line, the hinged trip arms 18 are withdrawn from their engagement with the eyes 15 of the holding rods 12, and thereupon the gripper slips 8 under the pressure of their springs 16 move upward and outward to a contact with the casing walls, as seen in Fig. 2. In this condition, they are not intended to afford support to the pump and tubing, which are otherwise borne, but it is apparent that any downward pressure would at once cause the slips 8 to bite into the casing walls, and thus the safeguard against the dropping or fall of the tubing, which is the object sought, is attained. The device will, however, readily pull up through the casing. The trip arms 18 with their head stem 19 and the bendable guide 21 of the latter which held the stem with accu-

racy, for the engagement of the wire line sucker rod socket, are pulled all the way up through the tubing and thrown to one side. Thereupon the piston and the sucker rods 22, as seen in Fig. 2, are dropped to place, and operations begin. The rods 12 by screwing into the nuts 11 can be adjusted in order to regulate the position of the gripper slips 8.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is—

1. A well-tubing safety-appliance comprising a hollow stock adapted to pass into the well casing and having means for connecting it with the tubing; gripping devices carried by the stock for engaging the well casing; and means for holding said gripping devices inoperative and releasing them for action, consisting of hinged trip arms within the stock, their ends projecting through and adapted to be withdrawn from holes in the stock walls, members connected with the gripping devices, with which the ends of the trip arms engage, and a liftable head stem within the stock to which the trip arms are hinged.

2. A well-tubing safety-appliance comprising a hollow stock adapted to pass into the well casing and having means for connecting it with the tubing; gripping devices carried by the stock for engaging the well casing; and means for holding said gripping devices inoperative and releasing them for acting, consisting of hinged trip arms within the stock, their ends projecting through and adapted to be withdrawn from holes in the stock walls, members connected with the gripping device, with which the ends of the trip arms engage, a liftable head stem within the stock to which the trip arms are hinged; and a bendable guide upon said head stem to hold it upright.

3. A well-tubing safety appliance comprising a stock adapted to pass into the well casing, and having means for connecting it with the tubing, said stock having inclined-plane seats in its outer wall deepening downward; gripper slips slidably mounted on said seats and so proportioned as to clear or to engage its casing walls according as they move down or up on their seats; and means for releasably holding said gripper slips down, and moving them up when released, consisting of rods connected with the slips, a liftable head stem within the stock, trip arms hinged to said head stem and having their outer ends passing through holes in the stock and engaging the lower end of the slip rods, and springs around said slip rods to throw the slips up when released.

4. A well-tubing safety appliance comprising a stock adapted to pass into the well casing and having means for connecting it

with the tubing, said stock having its outer
face formed with bosses adapted to fit the
inner wall of the casing, the rest of said
face being of smaller circumference where-
3 by channels are left between said face on
each side of the bosses and the well casing,
the bosses of said stock having their faces
formed with inclined plane seats deepening
downward; gripper slips slidably mounted
10 on said seats and so proportioned as to clear
or to engage the casing walls according as
they move down or up on their seats; and
means for releasably holding said gripper
slips down, and moving them up when re-

leased, consisting of rods connected with the 15
slips, a liftable head stem within the stock,
trip arms hinged to said head stem and hav-
ing their outer ends passing through holes
in the stock and engaging the lower end of
the slip rods, and springs around the slip 20
rods to throw the slips up when released.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

SAMUEL ALLEN GUIBERSON, JR.

Witnesses:

J. A. SMALL,

B. L. WYLLIE.