

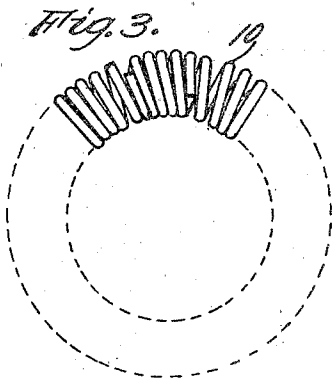
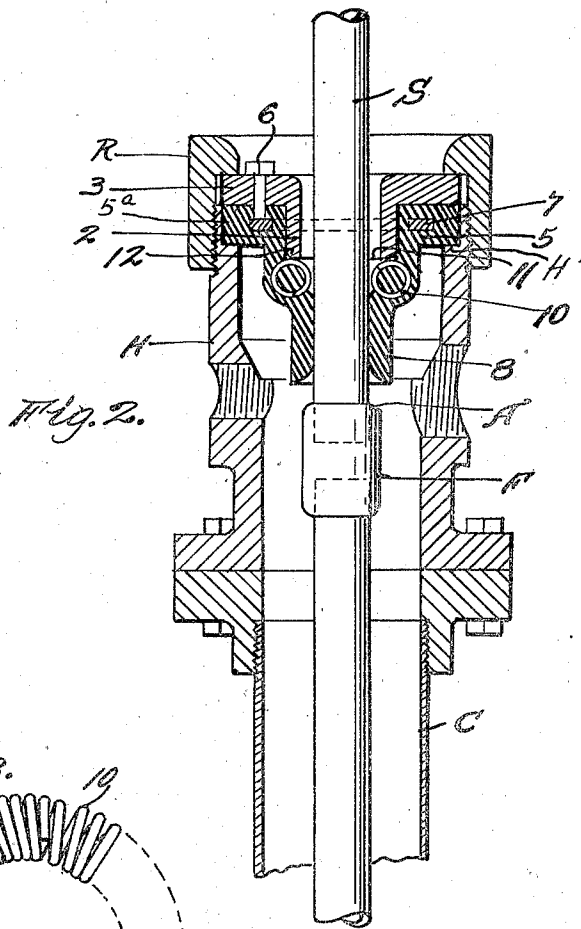
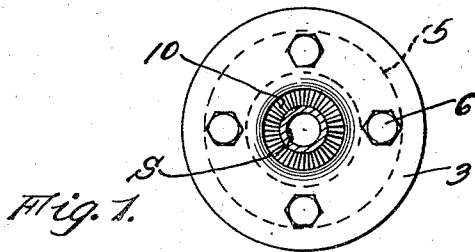
Aug. 29, 1939.

F. J. SCHWEITZER

2,170,915

COLLAR PASSING PRESSURE STRIPPER

Filed Aug. 3, 1937



Inventor,
F. J. Schweitzer

By F. E. Maynard,
att.

UNITED STATES PATENT OFFICE

2,170,915

COLLAR PASSING PRESSURE STRIPPER

Frank J. Schweltzer, Orange, Calif.

Application August 3, 1937, Serial No. 157,141

8 Claims. (Cl. 286-16)

This invention is an oil-well string packer and stripper.

In the deep well industry it is highly desirable that various string combinations, such as inside casing, tubing, drill pipe and other sections of apparatus, may be lowered into the well and reciprocated or rotated, or both, and pulled with safety against blow-out or noticeable leakage while the operation is carried on under the usual circulation pressure, or the incident of high pressure of natural origin in the well hole. An object of this invention is to provide a simple, practical, reliable, substantial, low-cost and readily installed assembly for the accomplishment of such a method of operation of the inserted string.

Another object is to provide a safety stripper and packer assembly which may be readily attached to various standard top fittings of well casings.

A further object is to provide a stripper assembly in the form of an integral unit composed of but few and simple parts.

Particularly, an object of the invention is to provide a stripper incorporating a pipe fitting nipple or sleeve of elastic rubber, that is, rubber soft enough to contract to snugly fit a given string section or to expand to permit a collar or other enlargement in the string combination to pass in or out of the nipple without loss of pressure and without disrupting the sleeve, and including a fixed basal support for the sleeve, and the provision of a safety girdle or guard whereby to prevent the mobile rubber from being dragged or forced into the bore of the support by an outwardly drawn string shoulder sliding through the rubber sleeve, or from flowing or being forced into the sleeve bore under fluid pressure, natural or circulation, in the well.

The invention consists in certain advancements in this art as set forth in the ensuing disclosure and having, with the above, additional objects and advantages as hereinafter developed, and whose construction, combination and details of means, and the manner of operation will be made manifest in the description of the annexed illustrative apparatus or embodiment; it being understood that modifications, variations and adaptations may be resorted to within the scope, principle and spirit of the invention as it is more directly claimed hereinbelow.

Figure 1 is a plan of the upper end of the stripper assembly as closed on a pipe section in a well string, of tool or other parts.

Figure 2 is an axial section of the installed

assembly as sealed on a pipe section of a string.

Figure 3 is a plan of a portion of a preferred form of the guard device to sustain the rubber against extrusion.

As shown, a short tubular hub 2 centric of a disc-like plate 3 is adapted to be secured, as by a cap ring R, to the rim of a complementary housing H on the upper end of a well casing C.

Snugly fitted on the hub 2 is an annular body 5 of firm but pliable rubber the rim bead or flange 5^a of which seats down on a bore shoulder H' in the housing to seal thereon when the clamp ring R is screwed down on the housing.

The packing body 5 is suitably secured to the bottom of the plate 3 as by bolts 6 engaging an anchorage 7 embedded in the rubber body; thus forming a unitary assembly.

The lower end of the rubber body 5 has a somewhat reduced, elongated nipple 8 the passage or bore of which is normally smaller than the outside diameter of a given string section S disposed in the casing C and is directly contractive thereon to make a good, elongated seal.

The bore of the hub 2 is large enough to pass shoulder-forming collars, joints or other fittings F which may be incorporated in the string combination S. The nipple 8 extends coaxially from the hub 2.

While flush joint fittings in a string may readily slide in or out through the embracing rubber nipple 8, of the stripper, there is, in cases where shoulders are presented along the string, a tendency of the shoulders to crowd the rubber into and choke the lower end of the supporting hub 2 as the string is pulled upward. This result in chopping off the rubber flowing into the hub and in the destruction of the device as a packing stripper.

Therefore, this invention incorporates suitable means to prevent the inflow and chopping of the rubber nipple during string pulling operations, and also to prevent a blow-out due to well or circulation pressure in the casing. A preferred form of guard device includes a metallic, helical spring bent into the form of a ring washer 10; the ends of the helix being screwed one into the other, Fig. 3, to effect a complete ring. This guard is molded in place at the junction of the reduced nipple 8 and the larger, lower end of the rubber body 5, and is partially exposed to directly, firmly and slidably rest against the near end face of the hub 2; the molded rubber filling the central space within the spring coils and the interstices between the spaced coils. The guard device is also exposed at the inner

side toward the pipe section or string S so that it may directly engage with the collar or fitting F but is normally clear of the pipe surface. Being embedded in the rubber body 5 therefore, the annular guard device will be distended by a passing collar F and will automatically contract with the body as the collar passes out in either direction, and at which times the rubber nipple 8 will be in constant, direct sealing contact with the smaller pipe string S. The ring or collar form of the washer 10, supported on the end of the hub 2, also facilitates automatic contraction and permits ready expansion.

The coil spring forming the ring washer 10 constitutes a number of independently movable, laterally spaced parts sliding radially in or out on the end of the hub 2 as the guard washer opens or closes to compensate for change of size between a passing pipe and its fitting F, and thus form an expansible barrier or dam at the mouth of the bore of the hub 2 to prevent upward flow of the rubber nipple 8 from fluid or collar pressure.

The end of the hub 2 has a flat face 11 engaged by and tangential to the bared, adjacent part of the guard washer 10 which is mostly embedded in the rubber body 5, and also has a slightly outwardly rounded corner 12 which facilitates the spreading or expansion of the barrier device 10 as it is internally contacted by the wedging shoulder A of a passing collar or fitting F.

There is thus provided, by this invention, an elongated, directly pipe-embracing, rubber nipple coaxial with the bore of the hub 2, and compensating, but firm washer-like barrier interposed between the inner end of the nipple and the lower end of the hub to preclude inflow of the rubber nipple into the bore under upward pressure of fluid in the well or from an outgoing pipe fitting F.

What is claimed is:

1. An oil well stripper including a housing, a cap plate removably secured to the housing and having a centric, reduced open-bore hub through which a shouldered string may pass, a rubber packing body externally fitting the hub and having an elongated nipple projecting axially from the inner end of the hub and being normally of smaller bore diameter than the hub bore and unlined so as to directly contract on a given string section passing through the hub and being expansible by a passing string shoulder, and a

resilient expansive barrier interposed between the inner end of the hub and the near end of the nipple and movably bearing on the end of the hub and projecting inwardly radially thereof whereby to prevent flow of the rubber into the bore of the hub under fluid or string shoulder pressure; said barrier being free to expand when a string shoulder passes in or out.

2. A device as set forth in claim 1, and in which the barrier is encircled by an expansible part of the rubber body.

3. A stripper as set forth in claim 1, the barrier being embedded in the said body and exposed at a part for operative bearing on the said extension end.

4. A stripper packing assembly comprising a cap plate having a downwardly extending reduced open-bore hub of a size of bore to pass a given string shoulder, a packing body secured on the hub and having a nipple extending axially from the hub and having an unlined bore directly contractive on a string section passing through the hub and freely expansible by a passing string shoulder, and an expansive and contractive guard device supported on the end of the hub for ready expansive radial movement and projecting across the inner open end of the hub bore and supporting the near end of the nipple to prevent its flow into the hub bore under fluid or string shoulder pressure and being free to expand as the shoulder passes.

5. A stripper as set forth in claim 4, said device including a ring or collar formed of a helical spring substantially embedded in the rubber and having a portion of its radial parts bared and directly engaging and contracting and expanding on the end of the said hub.

6. A stripper as in claim 4, and in which the device is circumferentially embedded in said body at the junction thereof with the reduced nipple.

7. A stripper as in claim 4, and in which said hub has a rounded exterior corner to facilitate the expanding action of the expansible guard device.

8. A stripper as set forth including a member having a collar passing bore and a bore guard and in which said guard consists of a substantially complete spring ring having a mean diameter greater than the diameter of the said bore, the ring extending inwardly across the bore end.

FRANK J. SCHWEITZER.