

Nov. 29, 1932.

H. E. DENNIE

1,889,060

WELL CASING PROTECTOR

Filed Aug. 7, 1930

Fig. 1.

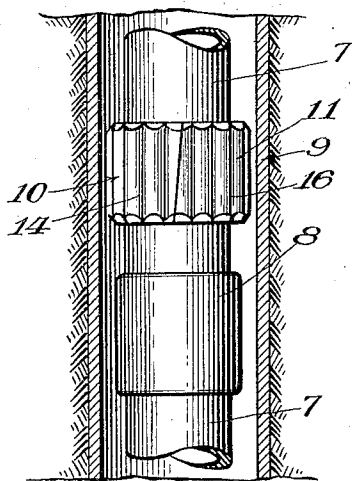


Fig. 2.

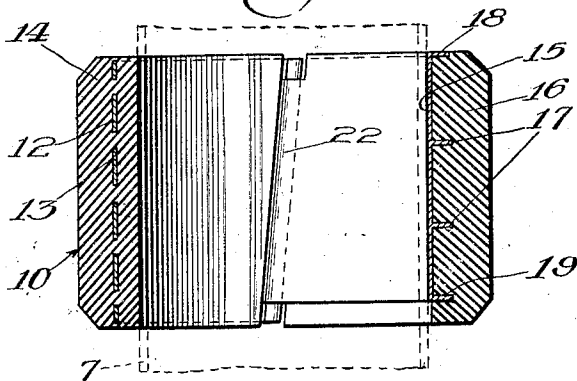


Fig. 3.

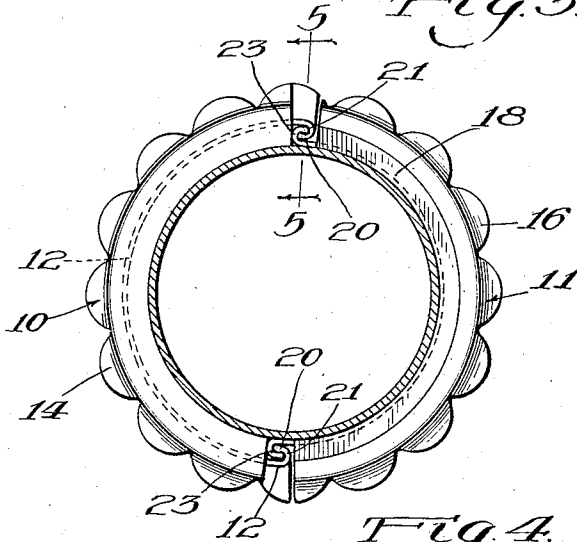


Fig. 4.

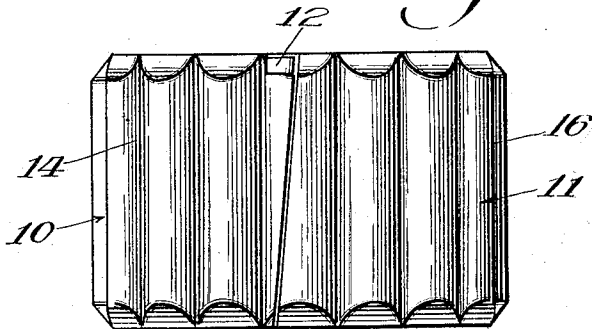


Fig. 5.

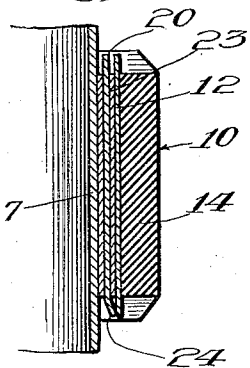
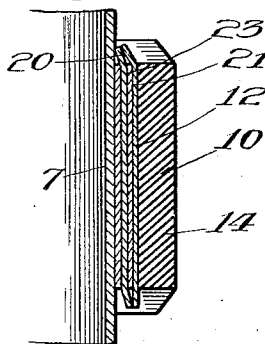


Fig. 6.



Inventor:
Harry E. Dennie,
By
Dyersmith, Lee, Chittton & Wile
Attys:

UNITED STATES PATENT OFFICE

HARRY E. DENNIE, OF CHICAGO, ILLINOIS

WELL CASING PROTECTOR

Application filed August 7, 1930. Serial No. 473,604.

My invention relates to means for protecting the casings of wells during the operation of members therein such as, and more particularly, drill-pipes of the rotating type and comprising pipe-sections coupled in end-to-end relation.

One of my objects is to provide a novel, simple, durable, and relatively inexpensive construction of protector by which the member, such as that formed of the coupled drill-pipes, in its movements in the well-casing, will be prevented from contacting with the casing.

Another object is to provide a construction of protector which may be readily applied to operative position on the member, such as that formed of the coupled drill-pipes, to operate in the casing, and which when applied thereto will be rigidly secured in position; and other objects as will be manifested from the following description.

Referring to the accompanying drawing:

Figure 1 is a broken view in elevation of a well-casing in position in the ground and a drill-pipe in the casing and provided with my improved protector, the casing and the ground being shown in section.

Figure 2 is a view in sectional elevation of my improved protector showing its parts in assembled position upon a drill-pipe illustrated by dotted lines.

Figure 3 is a plan sectional view taken through the drill-pipe and showing the protector thereon in plan before the sections of the protector have been interlocked to prevent accidental movement relative to each other.

Figure 4 is a view in side elevation of the protector of the preceding figures.

Figure 5 is a broken enlarged section taken at the line 5—5 on Fig. 3 and viewed in the direction of the arrows; and

Figure 6, a view like Fig. 5, showing the sections of the protector interlocked to prevent accidental separation.

I have chosen to illustrate my invention as applied to well-drilling apparatus that shown being of a common type involving a tubular drill formed of a series of endwise-

disposed pipes 7 adjacent ones of which are connected together by tubular couplings, the one shown as connecting the two pipe sections 7 in the fragmentary illustration in Fig. 1, being represented at 8.

The tool referred to is represented in the operation of drilling the well and as the drilling progresses a tubular well-casing represented at 9 and formed of sections of tubing, is sunk into the hole made by the drill and in surrounding relationship to the drill-pipe.

My improved protector, one of which would be applied preferably to each pipe section 7 between the couplings 8 at the ends thereof, in its use in connection with well-drilling apparatus as above referred to, comprises, in accordance with the preferred embodiment of my invention, two concavo-convex sections 10 and 11 which when assembled together on the pipe form a ringlike construction and which are provided with means which operate in the assembling of the sections on the pipe, by sliding one of the sections relative to the other thereof, to clampingly embrace the pipe.

The protector-section 10 comprises a concavo-convex metal strip 12, forming one section of a shell, shown as containing perforations therethrough and embedded in a resilient sheathing 14 preferably of relatively soft vulcanized rubber, the sheathing thus extending over both the inner and the outer surfaces of the shell-section 12 and through the openings 13 in the latter thereby interlocking the sheathing to the shell.

The protector section 11 also comprises a band 15 of metal forming the other section of the shell and of concavo-convex form, to the outer surface of which a sheathing 16 of resilient material as for example, and preferably, relatively soft vulcanized rubber, is applied, the band 15 being preferably provided with circumferentially extending ribs 17 of metal secured thereto in any desirable way as for example by welding them thereto which serve to aid in holding the shell-section 15 and the sheathing 16 against separation. The shell-section 15 is shown as of less length than the sheathing 16 and is provided at its op-

posite ends with outwardly turned flanges 18 and 19, respectively, the flange 18 preferably extending flush with the upper surface of the sheathing 16 as shown in Fig. 2 and the lower flange 19 being preferably embedded in the sheathing 16 as shown in this figure.

In the manufacture of the protector the sheathing material for the two sections 10 and 11, in uncured condition, and the shell-sections 12 and 15 are assembled together to the positions stated and the structure thus formed then subjected to the vulcanizing process.

The separate sections 10 and 11 thus provided are adapted to be clampingly secured to the pipe by relative lengthwise movement of the protector sections which latter are formed to interfit at their margins in such a manner as to be slidable longitudinally relative to each other and in such sliding movement contract, so to speak, about the pipe into a condition in which the protector firmly clamps the pipe.

The interfitting of the sections 10 and 11 at their margins as above stated is effected through the medium of sliding tongue and groove connections at these margins, the marginal edges of the shell-section 12 being curved inwardly and rearwardly as represented at 20 thereby presenting grooves 21 and the marginal edges of the shell-section 15, which are represented at 22 and are of less height than the marginal edges of the shell 12, as shown in Fig. 2, are outwardly and rearwardly turned as represented at 23 and extend at their free edges into the grooves 21.

To effect the clamping action referred to of the sections 10 and 11 about the pipe, the shell-section 12 at one end of the protector is made larger than at its other end and the shell-section 15 at the end thereof adjacent the small end of the shell-section 12 is made larger than the opposite end of the shell-section 15. In other words, the line of connection between the protector sections 10 and 11 is inclined slightly relative to the longitudinal axis of the protector whereby upon interfitting the sections 10 and 11 with each other at their larger ends and then relatively sliding these sections lengthwise of the pipe, these sections will be relatively drawn together into tight engagement with the pipe assuming substantially the position shown in the drawing.

The portion 20 of the shell-section 12, where it extends below the portions 22 and 23 of the shell-section 15 when the sections of the protector are assembled, is deflected outwardly as indicated at 24 thus closing the bottom of the grooves 21 and avoiding any possibility of section 11 lowering relative to the section 10 below the position shown in the drawing.

The parts of the protector would preferably be so proportioned that to effect the desired final clamping action of the protector on the pipe the section 11 would be hammered to final position, the hammer blows being driven against the upper flange edge 18 of the shell-section 15, it being noted that by forming the inside surface of the section 10 at which it engages the pipe, of resilient material, such as relatively soft rubber, relatively great frictional resistance to lengthwise movement of the section 10 is presented, while the section 11, because of the provision of the metal shell-section 15 at its inner surface for engagement with the pipe, may readily slide on the pipe, this feature insuring a tight clamping of the protector in place at any desired position along the pipe.

After the protector-sections 10 and 11 have been clamped about the pipe to the position shown in the drawing the upper extremities of the parts forming the recesses 21 are bent toward the pipe as represented in Fig. 6 thereby locking the sections 10 and 11 against movement lengthwise in a direction to release the clamping of these sections against the pipe.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention.

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

1. A well-casing protector for application to a member operating in said casing comprising sections having resilient external surfaces, and means for clampingly engaging said sections to said member by relative movement of said sections lengthwise of each other, the surface of one of said sections at which it engages said member being of metal and the corresponding surface of the other of said sections being of resilient material.

2. A well-casing protector for application to a member operating in said casing comprising sections each forming a section of a metallic shell, resilient material in which one of said shell-sections is embedded, resilient material applied to the outer surface of the other of said shell-sections the metal of said last-referred-to shell-section being exposed for contact with said member, and cooperating means on adjacent edges of said shell-sections adapted to slidably engage with each other to clamp said protector to said member.

3. A well-casing protector for application to a member operating in said casing comprising sections each formed of a section of a metallic shell, resilient material in which one of said shell-sections is embedded, resilient material applied to the outer surface of the other of said shell sections, the metal of said last-referred-to shell-section being

exposed for contact with said member, and
tongue and groove connecting means along
the adjacent edges of said shell-sections, said
shell-sections being smaller at one end than
5 at the other, whereby upon relatively sliding
said shell-sections lengthwise relative to each
other said protector sections will clampingly
engage said member.

HARRY E. DENNIE.

10

15

20

25

30

35

40

45

50

55

60

65