

April 5, 1932.

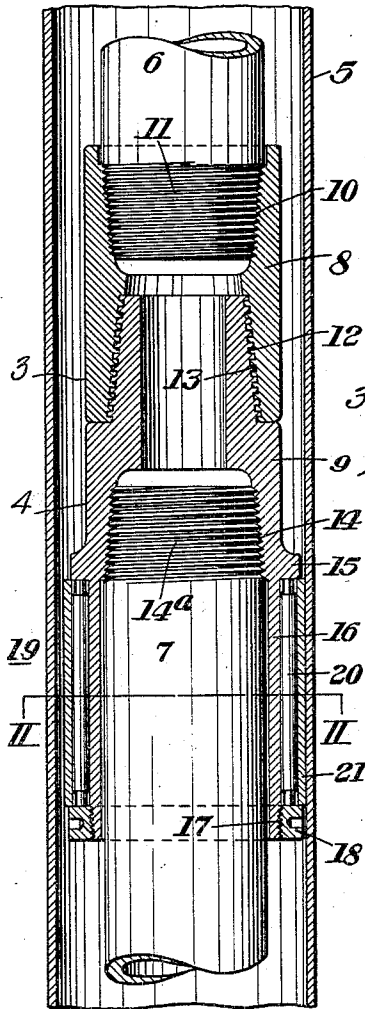
E. E. GREVE

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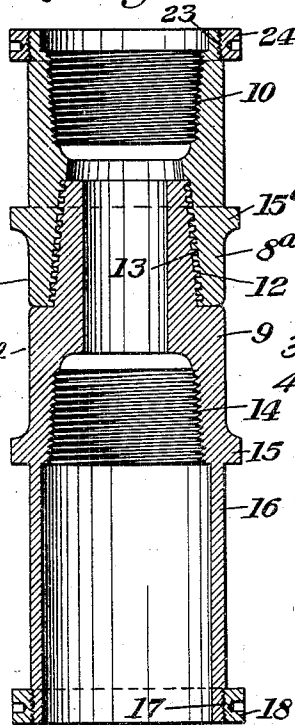
TOOL JOINT

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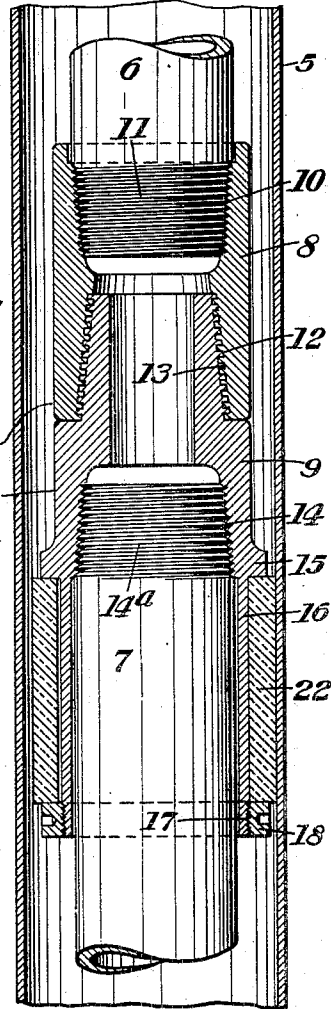
*Fig. 1.*



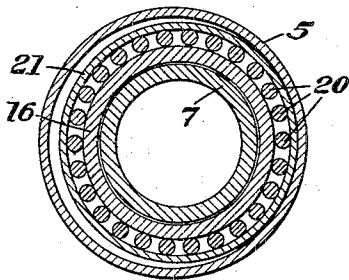
*Fig. 4.*



*Fig. 3.*



*Fig. 2.*



E. E. Greve <sup>Inventor</sup>  
by V. F. Doolittle

Attorney

## UNITED STATES PATENT OFFICE

EDGAR E. GREVE, OF BELLEVUE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO OIL WELL SUPPLY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY

## TOOL JOINT

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My invention relates to improvements in tool joints, and particularly to joints employed for connecting sections of drill pipe employed in drilling wells.

5 In the use of these joints, both the joints and the casing in which the drill pipe operates are subjected to considerable wear. One of the main objects of the present invention is to provide a joint having protector means for preventing wear on the joint as well as on the casing, said protector or wearing means being of such a character that they may be readily replaced when worn. A further object is to provide a joint embodying protector means of such a character that the drill pipe sections to which the joint is applied will not be injured.

Other objects and advantages of the invention will be pointed out or become apparent from a consideration of the following description taken in connection with the accompanying drawings.

In the drawings:

25 Fig. 1 is a vertical sectional view of a tool joint embodying my invention, said joint being shown in a section of the casing;

Fig. 2, a horizontal sectional view, the section being taken on line II—II of Fig. 1;

30 Fig. 3, a view similar to Fig. 1, showing a modified form of protector means employed in connection with the joint; and

35 Fig. 4, a vertical sectional view of a joint comprising the box and pin members, each having protector receiving means shown in connection therewith, the protector means being omitted.

Referring to the drawings, and first to Fig. 1, 5 designates a section of a casing of the character employed in oil and gas wells, and 6 and 7 respectively designate sections of a drill pipe of the form usually employed in rotary well drilling operations.

40 The tool joint, as illustrated and as preferred, includes a box-member 8 and a pin-member 9, each provided adjacent the joint therebetween with a grip portion 3 and 4 respectively for a tong. Box-member 8 is formed hollow, and is provided with an internally threaded tapered portion 10 adapted to receive the threaded end portion 11

of the drill pipe section 6. Box 8 is further formed with a tapered internally threaded portion 12 designed to receive the threaded end portion 13 of the pin member 9. Pin member 9 is provided with an internally threaded and tapering portion 14 adapted to receive the threaded end portion 14<sup>a</sup> of the drill pipe section 7.

In addition to the parts just mentioned, pin member 9 is provided adjacent the grip portion 4 with an outwardly projecting annular flange 15 and a hollow cylindrical extension 16, said extension being formed at its lower end with threads 17. The extension 16, together with the annular flange 15, constitutes protector receiving means, the latter being designed to be mounted thereon and be maintained in the desired operative position by means of a locking member, as, for example, a threaded ring member 18 designed to be attached to the lower threaded portion 17 of the said extension 16.

As illustrated in the form of Fig. 1, the protector, designated generally by the numeral 19, includes a series of rollers 20 and a freely rotatable collar or sleeve 21, rollers 20 extending vertically of the protector receiving means and being interposed between the outer face of the cylindrical extension 16 and the sleeve 21. From the above, it will be understood that the protector is maintained in operative position on the extension by means of the flange 15 and the locking means 18.

85 In the form of Fig. 3, the construction of the joint is identical with the construction shown in the form of Fig. 1. The protector, however, in this latter form differs somewhat from the protector means shown in the form of Fig. 1. In the form of Fig. 3, in place of the rollers and the outer sleeve, I employ as the protector or anti-friction means an elongated rotatable collar 22, preferably made of some suitable yielding material, as rubber. The protector 22 is positioned on the extension 16 and maintained thereon between the flange 15 and the locking ring 18 in the same manner in which the other protector means are maintained.

95 In the form of Fig. 4, the pin member of

the joint is of substantially the same construction as in the other forms described. In this form, however, I have shown protector receiving means formed on the box-member 8a, and for this purpose, have provided the box-member 8a with an annular flange 15a and with an upper exteriorly threaded portion 23 adapted to receive an internally threaded ring 24. By the employment of  
 10 this construction, it will be seen that the protector means may be applied to either the pin-member or the box-member of the tool joint, or to both, if so desired.

It will be understood that the protector  
 15 means may be readily applied to or removed from the joint structure and that the construction provides simple and effective means for preventing wear of both the joint and the casing in which the drill pipe operates. It  
 20 will also be noted that the construction permits the sections of drill pipe to be connected and disconnected in the usual manner, and that the drill pipe sections will not be injured due to sand, etc. working into and perhaps  
 25 temporarily affecting the proper functioning of the protector means, and, further, that the said protector means are not directly connected with the drill pipe sections.

The outer diameter of the protector means  
 30 is greater than the diameter of the joint proper and slightly greater than the projecting flange of the joint. Consequently, the protector will, as the drill pipe is operated and swings in the casing or hole, act as an anti-  
 35 friction bearing means.

I claim:

1. In combination, a tool joint comprising interfitting box and pin members each having adjacent the joint therebetween a grip  
 40 portion for a tong, one of said members having integrally formed therewith a cylindrical extension adapted to telescope over the end of a drill pipe and a protector mounted on said cylindrical extension.

45 2. In combination, a tool joint comprising a box member and a pin member each having adjacent the joint therebetween a grip portion for a tong and each having a threaded bore for engaging the threaded end of a drill  
 50 pipe, one of said members having integrally formed therewith a cylindrical extension adapted to telescope over a drill pipe engaged by said member, and a protector mounted on said cylindrical extension.

55 3. In combination, a tool joint comprising a box member and a pin member each having adjacent the joint therebetween a grip portion for a tong and each having a threaded bore for engaging the threaded end of a drill  
 80 pipe, one of said members having integrally formed therewith a cylindrical extension adapted to telescope over a drill pipe engaged by said member, and a protector rotatably mounted on roller bearings on said cylindrical extension.

4. In combination, a tool joint comprising interfitting box and pin members each having adjacent the joint therebetween a grip portion for a tong, one of said members having integrally formed therewith a cylindrical  
 70 extension adapted to telescope over the end of a drill pipe and a protector rotatably mounted on said cylindrical extension.

In testimony whereof I affix my signature.

EDGAR E. GREVE. 75

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