Sept. 25, 1945. B. ENGSTROM 2,385,408

THREAD PROTECTOR

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FIG. 1

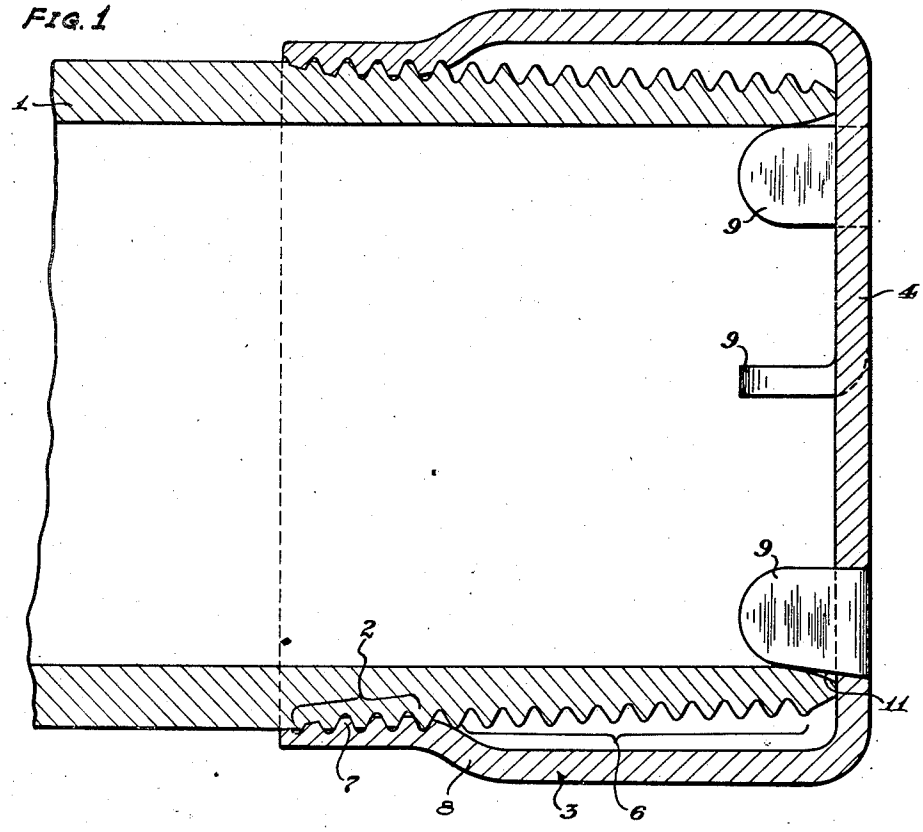


FIG. 2

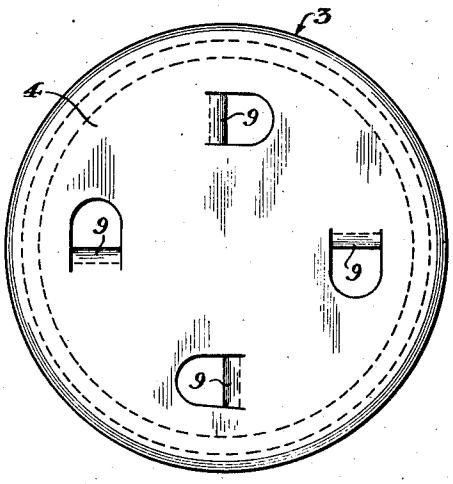
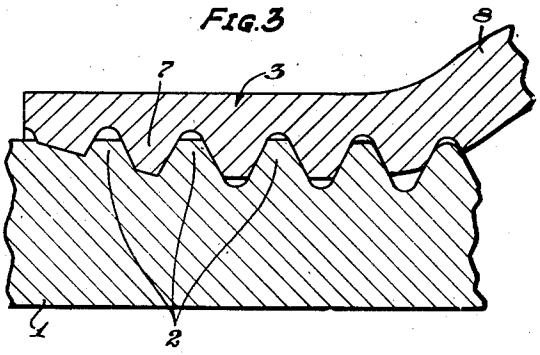


FIG. 3



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FIG. 4

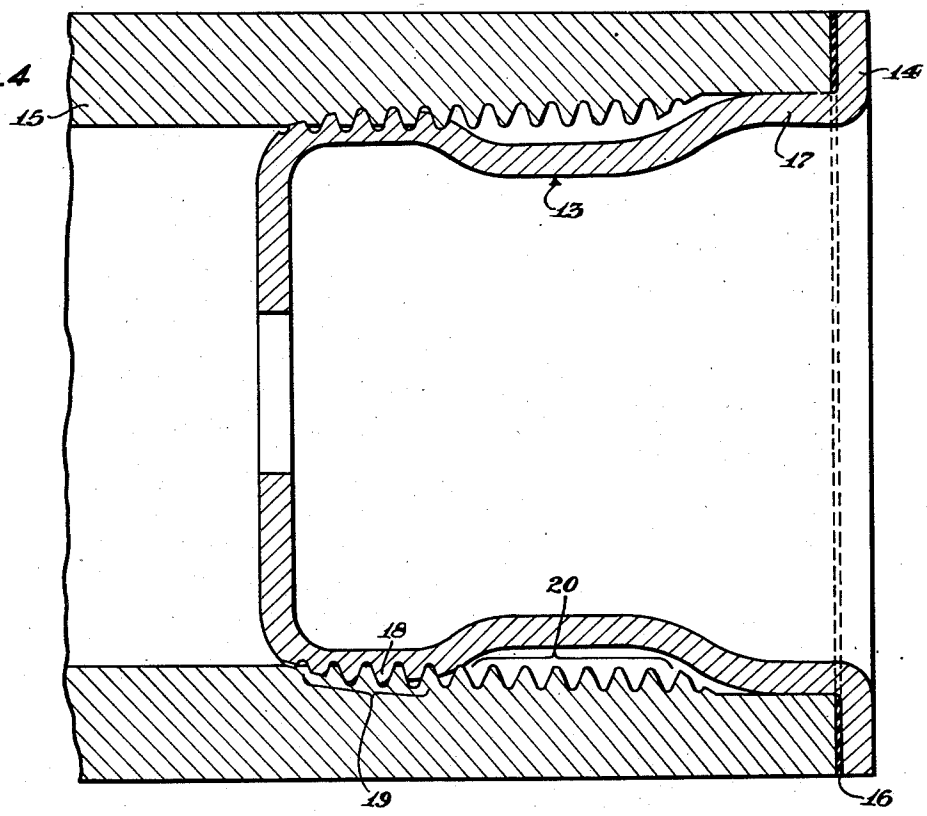


FIG. 5

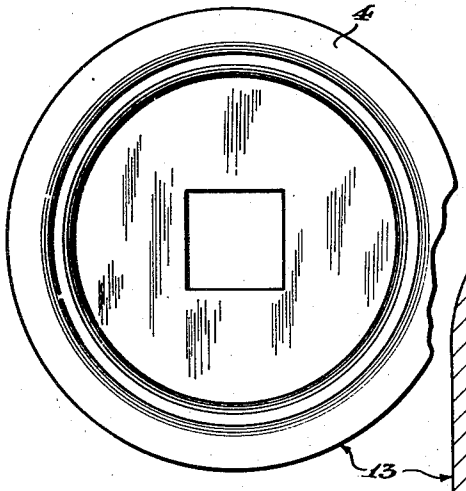
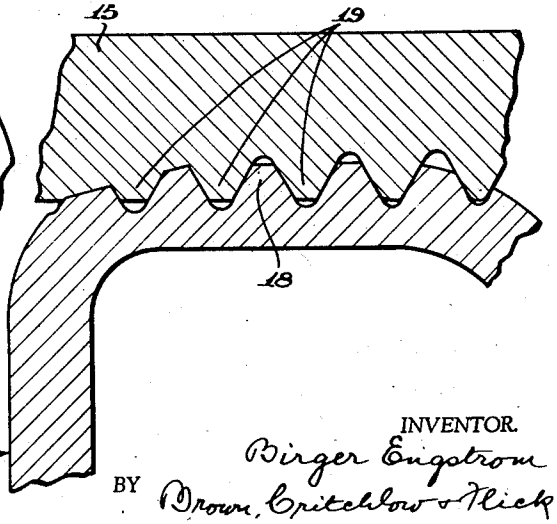


FIG. 6



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UNITED STATES PATENT OFFICE

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THREAD PROTECTOR

Birger Engstrom, Pittsburgh, Pa.

Application January 20, 1943, Serial No. 472,971

7 Claims. (Cl. 138—96)

This invention relates to pipe thread protectors, and more particularly to protectors for pipes having tapered threads.

A tapered pipe thread, which is understood in this art to be a thread encircling a frusto-conical surface, has an imperfect portion or runout at its inner end caused by the thread-cutting tool as it gradually leaves the pipe. This imperfect thread is not used in screwing pipes together, and therefore its condition is of little importance. As used herein, the word "pipe" should be interpreted broadly enough to cover couplings by which pipes are connected together because the problem of protecting the tapered thread is the same in either case. Although a great many different types of pipe thread protectors have been proposed, very few have met with much commercial success, chiefly because they are complicated, or do not protect as well as they should, or are too expensive to manufacture.

It is among the objects of this invention to provide a pipe thread protector which is simple in construction, inexpensive to manufacture, and satisfactory and dependable in use.

In accordance with this invention the thread protector consists of a generally cylindrical metal shell having a radial portion at its outer end adapted to overlie the end of a pipe having a tapered thread. The inner end portion of the shell is provided with an imperfect thread adapted to register only with the imperfect portion of the pipe thread when the protector is in position. The wall of the sleeve between its thread and the radial portion at its outer end is spaced from the perfect portion of the pipe thread, whereby no metal engages the portion of the pipe thread that it is intended to protect. In the case of my outside thread protector, the radial portion at its outer end is preferably in the form of an end plate provided with a member that projects into the pipe into frictional engagement with its inner surface to aid in maintaining the protector centered on the pipe and also to restrain it from unscrewing. In my inside protector the radial portion at its outer end is in the form of a flange. With either type of protector, if desired, a gasket can be compressed between the radial portion of the protector and the end of the pipe in order to seal the pipe thread.

The invention is illustrated in the accompanying drawings in which Fig. 1 is a longitudinal section through an outside thread protector mounted on a pipe; Fig. 2 is a reduced end view of the protector; Fig. 3 is an enlarged fragmentary section through the protector thread and the imperfect portion of the pipe thread; and Figs. 4, 5, and 6 are views similar to Figs. 1, 2, and 3, respectively, of an inside thread protector.

Referring to Figs. 1, 2, and 3, a pipe 1 is provided at its end with a tapered outside thread the last few turns 2 of which at the inner end are imperfect or incomplete in cross section. In accordance with this invention the thread protector that is mounted on the threaded end of the pipe consists of a generally cylindrical metal shell 3 that is closed at its outer end by an integral flat end member 4. Such a protector is formed by pressing a flat circular metal plate into the cup-like shape illustrated. The major portion of the shell is of greater diameter than the perfect portion 6 of the pipe thread which it is intended to protect so that there is no metal-to-metal contact between that portion of the thread and the protector. However, the inner end portion of the shell is reduced in diameter and provided with an imperfect inside thread 7 that registers with the imperfect portion 2 of the pipe thread, and with that portion only. Consequently, the protector is screwed onto the pipe and is held in place by threaded engagement with that portion of the pipe thread which is not used when the pipes are screwed together, so that it is more or less immaterial whether or not that portion of the pipe thread becomes damaged due to its direct contact with the protective metal shell. The reduced inner end of the shell is connected to the expanded outer portion by a gently tapered portion 8 that deflects axial blows against the protector at that point and permits other pipes to slide over the protector without knocking it off the pipe.

It will also be noted that the wall thickness of the inner end of the shell is reduced so that the diameter of the protector at its inner end is only slightly greater than the diameter of the pipe. This helps other pipes piled on this one to slide over the inner end of the protector without catching on it or knocking it off.

The end wall of the protector is provided with a plurality of instruck lugs 9, preferably disposed radially of the pipe, which engage the inner surface of the pipe. These lugs prevent lateral blows against the protector from canting it on the pipe, and they also, by their frictional engagement with the pipe, restrain the protector from accidentally unscrewing from the pipe. To assure this frictional engagement in case the spacing between the lugs is not accurate or is otherwise such that they would not engage the inner surface of the pipe, the outer edge 11 of one of the lugs is in-

clined outwardly so that a wedging effect is obtained when the protector is screwed onto the pipe, as shown in Fig. 1.

The inside protector shown in Figs. 4, 5, and 6 is likewise in the form of a generally cylindrical shell 13 having at its outer end a radial flange 14 that overlies the end of the pipe 15 and either engages it or compresses against it a gasket 16 that encircles the shell for thread-sealing purposes. Adjoining this flange for a short distance is an unthreaded portion 17 of the sleeve which engages a smooth unthreaded portion of the pipe that is customarily found between the outer end of the pipe thread and the end of the pipe. The inner end portion of the shell is provided with an outside imperfect thread 18 that registers only with the imperfect portion 19 of the pipe thread. The rest of the shell, that is, the portion between its thread and outer pipe-engaging portion 17, is reduced in diameter in order to space it from the perfect portion 20 of the pipe thread to avoid metal-to-metal contact.

According to the provisions of the patent statutes, I have explained the principle and construction of my invention and have illustrated and described what I now consider to represent its best embodiments. However, I desire to have it understod that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A pipe thread protector in the form of a cylindrical shell having a radial portion at its outer end adapted to overlie the end of a pipe encircled by a continuous tapered thread having at its inner end a few turns that are incomplete in cross section, the inner end portion of the shell being provided with a continuous thread that is incomplete in cross section and is adapted to register with only said few turns of the pipe thread when the protector is in position, and the wall of the sleeve between its thread and radial portion being spaced from the perfect portion of the pipe thread.

2. An outside thread protector in the form of a cylindrical shell adapted to receive the end of a pipe encircled by a continuous outside tapered thread having at its inner end a few turns that are incomplete in cross section, the outer end of the shell being closed by an integral end member provided with a plurality of inwardly struck lugs for projecting into the pipe and frictionally engaging it to restrain the shell from unscrewing and to aid in holding the outer end of the shell in centered position, the inner end portion of the shell being provided with a continuous inside thread that is incomplete in cross section and is adapted to register with only said few turns of the pipe thread when the protector is in position, and the portion of the shell between its thread and end member being enlarged to space it from the perfect portion of the pipe thread.

3. An inside pipe thread protector in the form of a cylindrical shell having a radial flange at its outer end adapted to overlie the end of a pipe having an inside tapered thread, the inner end portion of the shell being provided with an imperfect outside thread adapted to register with only the imperfect portion of the pipe thread when the protector is in position, and the portion of the shell between its thread and flange being spaced from the perfect portion of the pipe thread.

4. An inside pipe thread protector in the form of a cylindrical shell having a radial flange at its outer end adapted to overlie the end of a pipe having an inside tapered thread and a smooth unthreaded surface between the thread and end of the pipe, the inner end portion of the shell being provided with an imperfect outside thread adapted to register with only the imperfect portion of the pipe thread when the protector is in position, the portion of the sleeve adjoining said flange being adapted to engage said smooth surface of the pipe, and the portion of the shell between said last-mentioned portion and its thread being reduced in diameter to space it from the perfect portion of the pipe thread.

5. An inside pipe thread protector in the form of a cylindrical shell having a radial flange at its outer end adapted to overlie the end of a pipe having an inside tapered thread and a smooth unthreaded surface between the thread and end of the pipe, the inner end portion of the shell being provided with an imperfect outside thread adapted to register with only the imperfect portion of the pipe thread when the protector is in position, the portion of the sleeve adjoining said flange being adapted to engage said smooth surface of the pipe, the portion of the shell between said last-mentioned portion and its thread being reduced in diameter to space it from the perfect portion of the pipe thread, and a gasket encircling the shell and adapted to be compressed between said flange and the end of the pipe.

6. An outside pipe thread protector in the form of a cylindrical shell having a radial portion at its outer end adapted to overlie the end of a pipe encircled by a continuous outside tapered thread having at its inner end a few turns that are incomplete in cross section, the inner end portion of the shell being provided with a continuous inside thread that is incomplete in cross section and is adapted to register with only said few turns of the pipe thread when the protector is in position, the portion of the shell between its thread and radial portion being spaced from the perfect portion of the pipe thread, and the wall of the shell at its inner end being reduced in thickness and being connected to said spaced portion by a gradually diverging portion of the shell wall.

7. An outside pipe thread protector in the form of a cylindrical shell having a radial portion at its outer end adapted to overlie the end of a pipe having an outside tapered thread, the outer end of the shell being closed by an integral end member provided with a plurality of inwardly struck lugs for projecting into the pipe and frictionally engaging it to restrain the shell from unscrewing and to aid in holding the outer end of the shell in centered position, the inner end portion of the shell being provided with an imperfect inside thread adapted to register with only the imperfect portion of the pipe thread when the protector is in position, the portion of the shell between its thread and radial portion being spaced from the perfect portion of the pipe thread, and the wall of the shell at its inner end being reduced in thickness and being connected to said spaced portion by a gradually diverging portion of the shell wall.

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