P. J. SHRUM.

METHOD OF MAKING THREAD PROTECTORS.

APPLICATION FILED FEB. 24, 1914.

1,118,372. Patented Nov. 24, 1914.

FIG. 1.

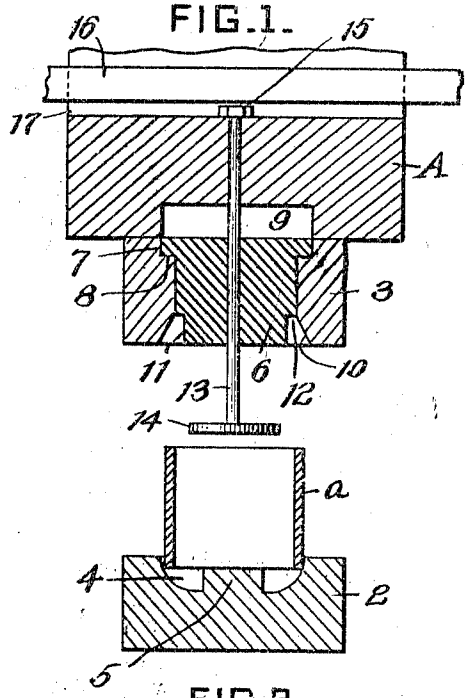


FIG. 2.

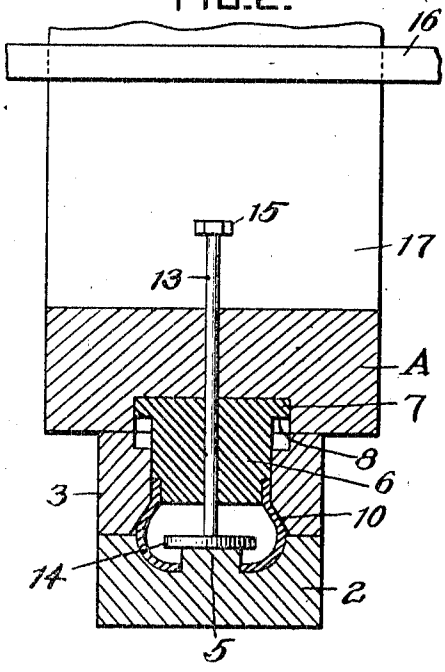


FIG. 3.

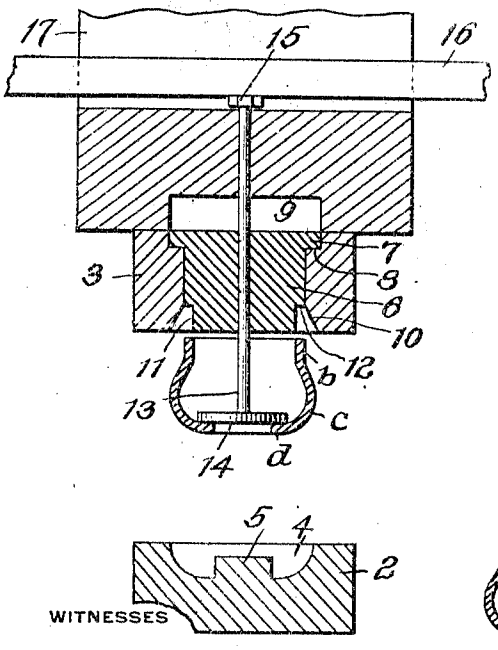


FIG. 4.

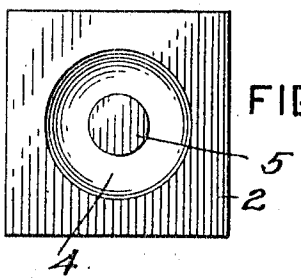


FIG. 5.

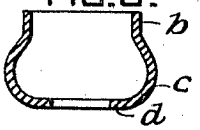


FIG. 6.

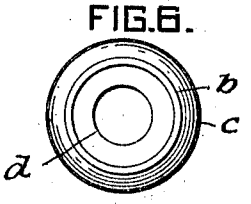
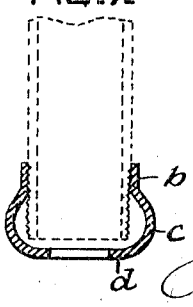


FIG. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING THREAD-PROTECTORS.

1,118,372. Specification of Letters Patent. Patented Nov. 24, 1914.

Application filed February 24, 1914. Serial No. 820,398.

To all whom it may concern:

Be it known that I, PETER J. SHRUM, a citizen of the United States, residing at Monaca, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Methods of Making Thread-Protectors, of which the following is a specification.

My invention consists of an improved method of making thread protectors or similar articles from longitudinal cylindrical sections of metal tubing, and has for its object particularly to form devices of this kind for the purpose of making thread protectors, of the type disclosed in the prior patent of Apr. 23, 1912, No. 1023969, issued to myself, William C. Rae and Joseph W. Ripper.

The protector consists of a cylindrical shell having a contracted end portion for the threads, a bulging clearance portion near the other end, and an inwardly turned limiting flange.

The device is formed from tubing, preferably seamless tubing, by an upsetting process, whereby to turn the one end of the blank inwardly, reducing its internal diameter to provide the limiting flange, and at the same time forcing the other end longitudinally of the blank, and also drawing it inwardly for the threaded portion, the operation being performed in one continuous step, by means of suitable dies.

In the drawings illustrating the operation or method,—Figure 1 shows the upper and lower die in open position, with the tubular blank inserted, ready for the operation. Fig. 2 is a similar view, showing the dies closed together at the end of the operation. Fig. 3 is a sectional view of the dies, like Fig. 1, showing the operation of stripping the finished protector from the upper die. Fig. 4 is a plan view of the lower die. Fig. 5 is a longitudinal sectional view of the longitudinally pressed blank, as formed between the dies. Fig. 6 is a plan view of the device. Fig. 7 is a vertical sectional view of the finished protector, provided with the attaching threads, and in operative relation to the end of the pipe, shown in dotted lines.

In the drawings, the blank *a* consists of a section of tubing of the required length, diameter, and thickness to produce the finished article for attachment upon the threaded end of the pipe to be protected and of the particular size for which the protector is designed. The blank should be of such a length as to provide at its upper portion a straight section or neck *b* which is to be slightly constricted or reduced in diameter, and a lower bulging or rounded section *c*, the terminal edge of which is to be turned inwardly to form the limiting flange *d*, as clearly shown in Figs. 5 and 6.

The dies for forming the device consist of a lower, preferably stationary, die 2 and an upper vertically movable die 3—6, adapted to be mounted in and actuated by the reciprocating head A of a suitable press.

The lower die 2 is provided with a bowl-shaped cavity 4, of a diameter adapted to receive the end of the blank *a*, rounded inwardly toward the center, whereby to force the edge of the blank inwardly as it is pressed downwardly by the upper compound die 3—6. At the center of the lower die 2 is a circular abutment 5, extending upwardly sufficiently far to provide a limiting central core for the inwardly swaged edge of the blank, as indicated in Fig. 2.

The upper outer die 3 is secured to head A and is provided with a cylindrical telescoping mandrel die 6 supported by an upper limiting flange 7 upon an annular shoulder 8, a clearance space 9 being provided above die 6, preferably in head A, to allow for upward movement of die 6, as in Fig. 2.

Outer die 3 is provided with an annular flaring wall 10 of bell form, adapted to compress the entering edge portion *b* of the blank inwardly toward the terminal 11 of die 6. Said terminal is reduced in diameter to provide a mandrel bearing for the contracted end *b* of the formed article, beyond an annular shoulder 12. The depth of clearance cavity 9 is substantially equal to the length of the straight neck *b*, which engages shoulder 12 and forces die 6 upwardly, as in Fig. 2. The space for the remainder of the protector, comprising the rounded bulging portion *c*, is divided between the depth of the flaring bebb portion 10 and of the bowl-shaped or dished portion 4 of the die 2.

Centrally of die 6 and extending upwardly through head A is a knock-out rod 13 having at its lower end a knock-out disk or abutment 14 and at its upper end a limiting nut or collar 15. An arresting bar 16

extends through a clearance opening 17 in head A, against which the upper end of rod 13 strikes, as the finished article is raised by the upper die and the holding action of the compressed ring around terminal 11. Rod 13 being thus arrested, disk 14 engages against the inwardly turned flange *d*, forcibly detaching the finished article from the central die, as in Fig. 3, allowing it to drop off, leaving the machine ready for the next operation.

When the dies are brought together, the opposite end portions of the blank will be drawn inwardly, the maximum diameter of the blank being substantially retained in the crown of the bulging portion *c*. The metal in the end retaining lip or flange *d* and in the threaded providing portion or neck *b* is therefore compressed or densified, thereby increasing its strength and enduring qualities, and providing for cutting of the threads in the finished article. Such finished article, as shown in Fig. 7, is provided with the interior threads 11, tapped co-extensively with the length of the inner straight portion of the neck *b*, and when the protector is screwed upon the pipe, as indicated, its movement is limited by the terminal flange *d*, while at the same time practically covering the entire threaded portion of the tube.

By the above described method I am enabled to dispense with the use of interior mandrels heretofore employed and to produce the finished article in one operation, ready for the threading step.

It will be understood that the size, proportions, and other elements of the dies are to be designed for each particular size, shape, and gage of protector, and that the operation may be performed in connection with any suitable forming mechanism having other details of construction, within the province of the skilled mechanic.

Having described my invention, what I claim is:

1. The method of making thread protectors from tubular blanks consisting in simultaneously applying endwise and inward transverse swaging pressure at the terminal portions of the blank while maintaining the normal diameter between the same.

2. The method of forming the body portion of a thread protector from a blank of open-ended tubing consisting in simultaneously applying endwise and inward transverse swaging pressure at the terminal portions of the blank, maintaining the normal diameter between the end portions, and providing a straight tubular section at one reduced end of the blank.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

PETER J. SHRUM.

Witnesses:
WM. G. BREMER,
GILBERT TRUMPETER.