O. WIEDEKE.

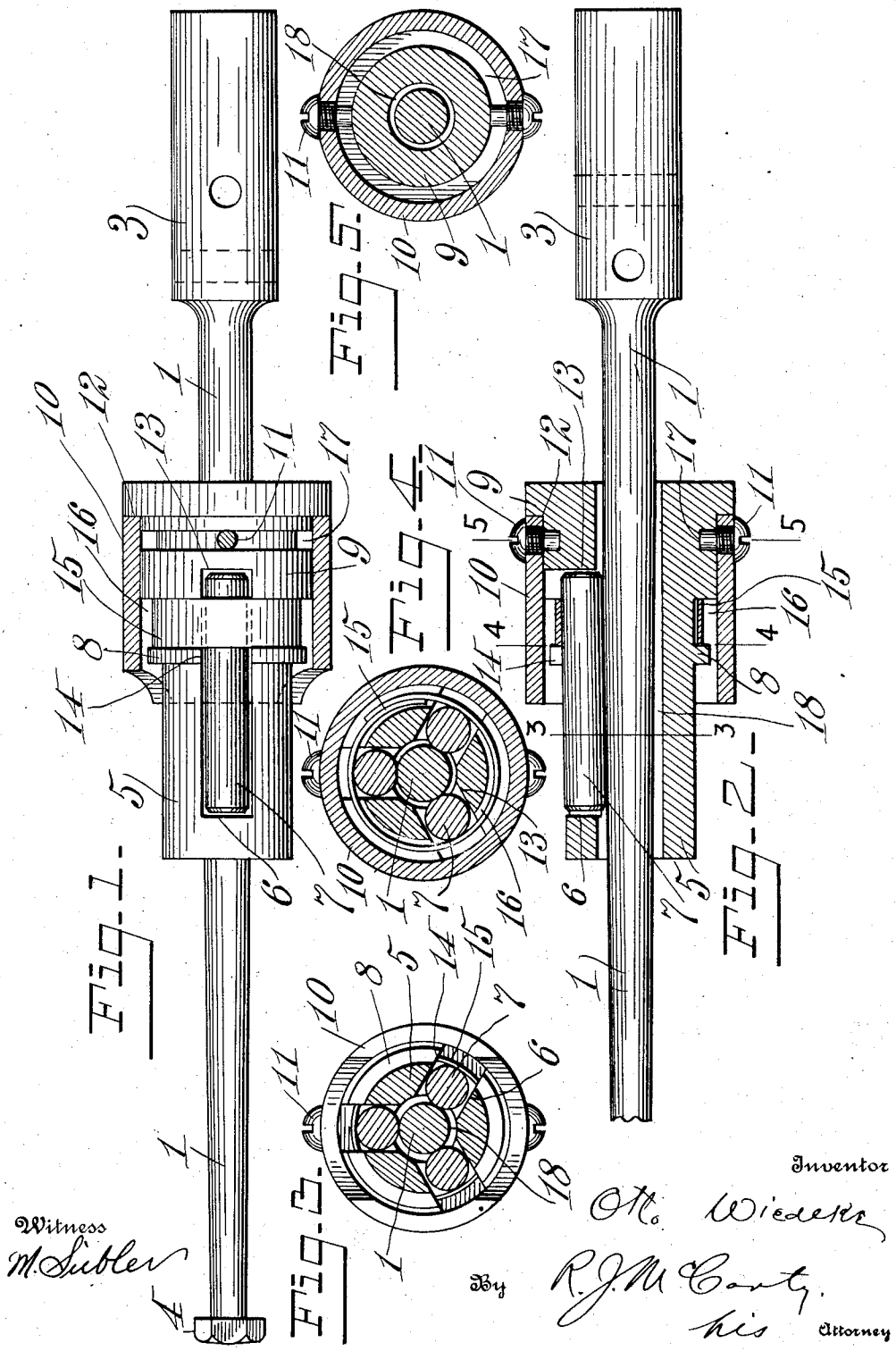
BOILER TUBE EXPANDER.

APPLICATION FILED OCT. 26, 1917.

1,265,283.

Patented May 7, 1918.

2 SHEETS—SHEET 1.



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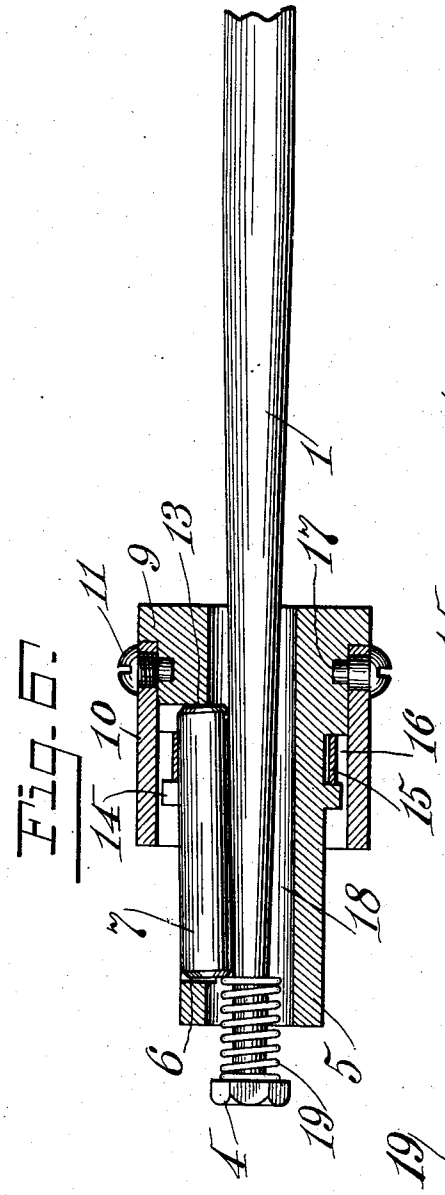


Fig. 5.

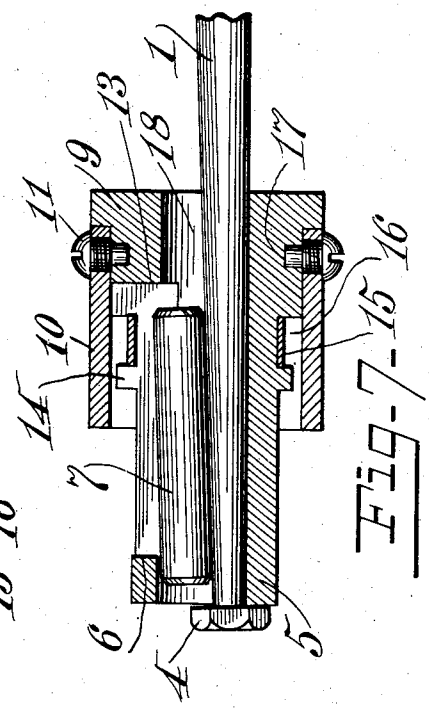


Fig. 7.

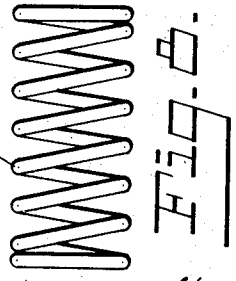


Fig. 8.

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BOILER-TUBE EXPANDER.

1,265,283. Specification of Letters Patent. Patented May 7, 1918.

Application filed October 26, 1917. Serial No. 198,575.

To all whom it may concern:

Be it known that I, OTTO WIEDEKE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Boiler-Tube Expanders, of which the following is a specification.

This invention relates to new and useful improvements in boiler tube expanders. The object of the invention is to provide a tube expander with certain structural characteristics which contribute to the utility of the implement and make it possible to construct a tube expander in largest and smallest sizes and with a great range of expansive capacity. The structural features which enable this range of utility reside in the way the roller cage is constructed and in the length of the rollers as well as the means which coöperate with the structural features of the cage to maintain the expanding rollers in position. The various structural features thus previously referred to are illustrated in the accompanying drawings to which general reference is now made.

Of the accompanying drawings Figure 1 is a longitudinal elevation of my improved tube expander with the guard shown in section. Fig. 2 is a longitudinal elevation showing the roller cage and guard in section. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a sectional view on the line 4—4 of Fig. 2. Fig. 5 is a sectional view on the line 5—5 of Fig. 2, Fig. 6 is a view similar to Fig. 2 showing a modified construction which is especially adapted to expanders having a maximum amount of expansibility, Fig. 7 is an assembled view of some of the parts in Fig. 6 showing the possibility of the rollers becoming displaced when the resilient sleeve or spring is not provided, and Fig. 8 is a view of the resilient sleeve or spring.

In a detail description of the invention in connection with the accompanying drawings the same reference characters will denote corresponding parts in the drawings.

The mandrel 1 is of the usual tapered form with a head 3 and a retaining member 4 on the small end thereof which serves to prevent the cage with the rollers from sliding off the mandrel when being handled. The cage and the rollers are of special construction both being longer than the similar parts found in the common run of boiler tube expanders. The cage consists of the usual barrel portion 5 with the usual longitudinal opening 6 through which the rollers 7 project throughout their lengths, and a central opening 18 through which the mandrel 1 extends. The rollers 7 are of usual length and owing to this and the formation of the cage, they may be reversed in their positions so that the entire length of said rollers may be utilized for expanding tube. The diameter thereof is uniform throughout which also enables said rollers to be reversed when they become worn on one end. Substantially mid-way of the cage or possibly a little to one side of the center of the cage a flange 8 is integrally formed thereon and another and larger flange 9 which forms the head of the cage and to which the usual guard 10 is rotatably attached at one end by means of screws 11 and groove 17. The head portion of the roller cage is circumferentially reduced as at 12 to provide space for the guard 10 to lie flush with the outer circumference of said head. The head 9 and the flange 8 of the cage provide a circumferential recess 16 and the rollers 7 are of a length to project across said recess 16 and into openings 13 in the head. The flange 8 is also provided with openings 14 through which the expanding rollers 7 project in lying across the recess 16 between the flange 8 and the head 9. Within this recess 16 and extending over the rollers 7 is a spring or elastic band 15 which serves to maintain the rollers in the cage and against dropping out of their positions when the implement is being manipulated. The ends of this resilient member 15 over-lap as shown in Fig. 4 and the said member is of sufficient tension to hold the rollers in position while at the same time, when the said rollers are expanding through the insertion of the mandrel into the cage, the said member 15 will expand thus allowing the rollers to move out under the force of the mandrel and perform their functions in the operation of the implement. Figs. 6, 7 and 8 show a construction in which a maximum amount of expansibility is obtained. In this construction the central bore 18 is of a diameter which accommodates the large end of the mandrel, and is large enough to receive the rollers, when the cage is at the small end of the mandrel, and the mandrel

is displaced to the side as shown in Fig. 7. To prevent this displacement of the rollers, a resilient sleeve 19 is provided. In the present instance the resilient sleeve consists of a coil spring which surrounds the small end of the mandrel and in the present instance is held thereon by the stop 4. When the cage 5 is moved to the small end of the mandrel, to permit the rollers to recede into said cage so that the cage may be inserted in the tube to be expanded, the spring 19 forces the rollers 7 against the end of the openings 13 and prevents them dropping out of alinement with the openings in the cage and passing out of the end of the cage. The spring 19 also, acting as a sleeve, prevents the mandrel becoming displaced to an extent which would permit the rollers 7 to pass into the bore 18. This is done by the end of the spring engaging directly the ends of the rollers. The tube expander shown and described is adapted for a broad range of use and is equally efficient for heavy work or light work. The roller cage is essentially of a length to provide the space 16 for the spring band 15 and the rollers are essentially of a length necessary to be encompassed by said member 15.

Having described my invention I claim:

1. In a tube expander, the combination of expanding rollers, a cage in which said rollers are placed said cage having a central longitudinal bore, a tapered mandrel adapted to penetrate said bore to expand the rollers, a helical spring carried on the small end of the mandrel and adapted to enter the bore of the cage and to occupy a portion thereof and thereby prevent the expanding rollers from passing out through the bore of the cage when the cage is at the small end of the mandrel, and means engaging the circumference of the cage and the rollers and serving to hold the rollers in the cage when the tool is not in use.

2. In a tube expander, the combination with a tapered mandrel, and a roller cage having an axial opening of maximum diameter to accommodate the greatest diameter of the working surface of the mandrel, of a series of reversible rollers mounted in said cage and engaged by said mandrel, said rollers being of uniform diameter throughout their length, a helical spring mounted on the small end of said mandrel and engaging the adjacent ends of said rollers when said rollers are relaxed and whereby the rollers are prevented from passing out between the end of the mandrel and the cage when the implement is being handled, and a stop on the end of the mandrel forming an abutment for said spring, substantially as specified.

In testimony whereof I affix my signature.

OTTO WIEDEKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."