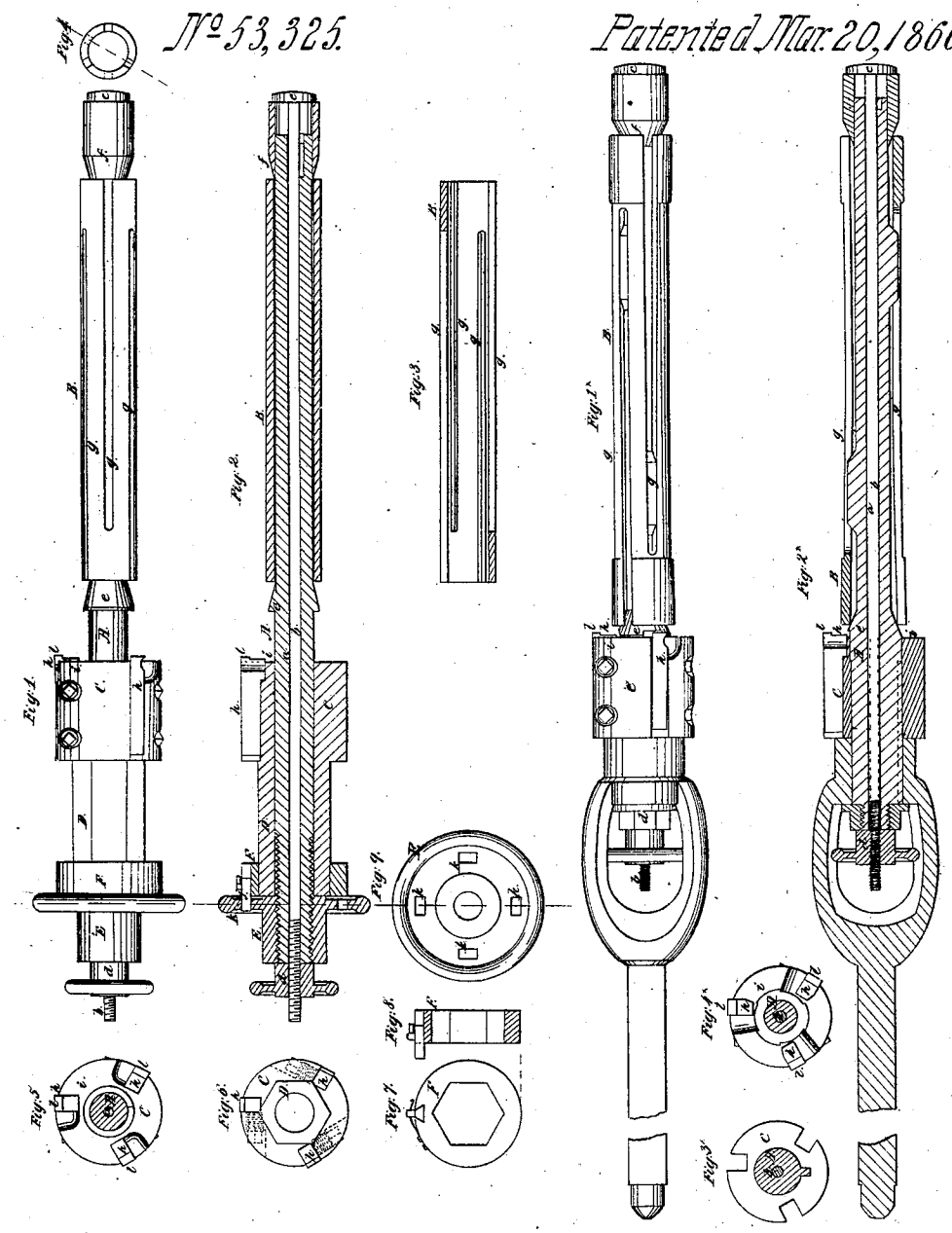
D. M. Nichols,

Boiler-Tube Cutter.

No. 53,325. Patented Mar. 20, 1866.



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IMPROVED TOOL FOR CUTTING OFF BOILER-TUBES.

Specification forming part of Letters Patent No. **53,325**, dated March 20, 1866.

To all whom it may concern:

Be it known that I, D. M. NICHOLS, of the city, county, and State of New York, have invented a new and Improved Tool for Cutting Boiler-Tubes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a side elevation of this invention. Fig. 2 is a longitudinal central section of the same. Fig. 3 is a detached longitudinal section of the expanding sleeve. Fig. 4 is an end view of the same. Fig. 5 is a front view of the cutter-head detached. Fig. 6 is a rear view of the same. Fig. 7 is a detached elevation of the device for locking the feed-wheel. Fig. 8 is a transverse section of the same. Fig. 9 is a front view of the feed-wheel detached. Fig. 1* is a side elevation of a modification of this tool. Fig. 2* is a longitudinal central section of the same. Fig. 3* is a detached end view of the cutter-head when the cutters are removed. Fig. 4* is a similar view of the same with the cutters.

Similar letters of reference indicate like parts.

This invention relates to a tool which is intended for the purpose of cutting boiler-tubes to the proper length, either before putting them in their places or after putting them in and fastening one end. It is constructed of a bar or shaft with a hole bored through its longitudinal center to receive the tightening-screw, and with a stationary and shifting cone, in combination with an expanding sleeve or any other suitable expanding device, in such a manner that by the act of the tightening-screw on the shifting cone both ends of the sleeve are expanded, and the bar or shaft can be secured or guided in a tube in a central position ready for the operation of cutting. The cutters are secured in a head which is keyed or otherwise secured on the shaft, and which is provided with a true face, beyond which the cutters are set the required distance, so as to determine the depth of the cut and to obtain a uniform feed with or without a positive motion.

A represents a bar or shaft of iron or other suitable material, which is provided with a hole, *a*, extending throughout its longitudinal center, and made to receive the screw *b*, which is provided with a head, *c*, at one end, with a nut, *d*, at the opposite end, as shown particularly in Fig. 2 of the drawings. The shaft A is furnished with a stationary cone, *e*, and with a shifting cone, *f*, and situated between these two cones is the expanding sleeve B. This sleeve is made of iron or other suitable material, and it is furnished with slots *g*, cut in form opposite ends at suitable distances apart, so that by causing the cones *e f* to enter its ends said sleeve is expanded, and if the shaft has been inserted into a tube by the expanding sleeve it can be securely fastened in a concentric position, or so arranged that it turns in said tube in the desired central position.

The operation of expanding the sleeve is effected by turning the nut *d* so that the head *c* of the screw *b* bears against the shifting cone *f* and causes the same to enter the outer end of the sleeve, at the same time forcing its inner end on the stationary cone *e*. The shaft A may, however, be adjusted in the proper position in the tube by other means besides this expanding sleeve; and I do not wish to confine myself to the precise arrangement of parts shown in the drawings, but I reserve the right to use any suitable expanding device. Instead of one sleeve, for instance, two separate sleeves or rings might be arranged on the shaft *a* at suitable distances apart and made to expand by scrolls or by cams or other means, although I use, by preference, the sleeve shown in the drawings, as the same forms a good bearing for the shaft, and is not liable to get out of order.

The cutters *h* are secured in a cutter-head, C, which is firmly keyed or otherwise secured to the shaft A. This head is provided with a true face, *i*, beyond which the cutting-edges of the cutters are made to project just sufficient to cut to the desired depth, so that the same cannot take a heavier cut than desired, and that a uniform feed is obtained whether the feed be effected by a lever, weight, or spring, or by a positive power, such as a feed-screw, or by a ratchet-brace or other mechanism.

When the cutter-head is keyed directly to the shaft A, as shown in Figs. 1* and 2*, the feed is effected by a lever bearing on the end of the said shaft, or the shaft may be provided with an extension capable of receiving a ratchet-brace or other suitable mechanism; but in prac-

tice I prefer to mount the cutter-head on a sleeve, D, (see Figs. 1 and 2,) which slides on the shaft A, and to which a feed motion is imparted by a hand-wheel, E, which screws on the end of the shaft A, as shown. In this case the sleeve D is made hexagonal or otherwise so formed that a suitable wrench can be applied for turning the same, and on its outer end, next the feed-wheel E, is mounted a collar, F, which is provided with a dog, *j*, that slides in and out, and which, when moved out, as shown in Fig. 2, catches into corresponding holes *k* in the feed-wheel, so that said wheel is compelled to turn with the sleeve D and cutter-head, and an automatic feed is effected. When the dog is moved back, the feed-wheel turns independent of the sleeve, and it must be turned by hand in order to produce the desired feed.

The cutters are made with projecting lips *l*, intended to strike the tube-sheet, if a tube is cut, when in its place, and to prevent the operator from cutting off any more than desirable. In practice several sizes of cutter-heads and expanding sleeves must be provided for tubes of different diameter. If desired, the cutters may be so arranged that they cut from the inside instead of from the ends of the tubes.

I claim as new and desire to secure by Letters Patent—

1. The shaft A, provided with a suitable expanding or centering device, in combination with the cutter C and suitable feeding device, all constructed and operating substantially as and for the purpose set forth.

2. The expanding sleeve B, in combination with the stationary and shifting cones, and with the tightening-screw *b* and shaft A, constructed and operating substantially as and for the purpose described.

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Witnesses:

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