March 26, 1929. H. A. LACERDA 1,707,124

BOILER MAKER'S TOOL

Filed Dec. 1, 1925 2 Sheets-Sheet 1

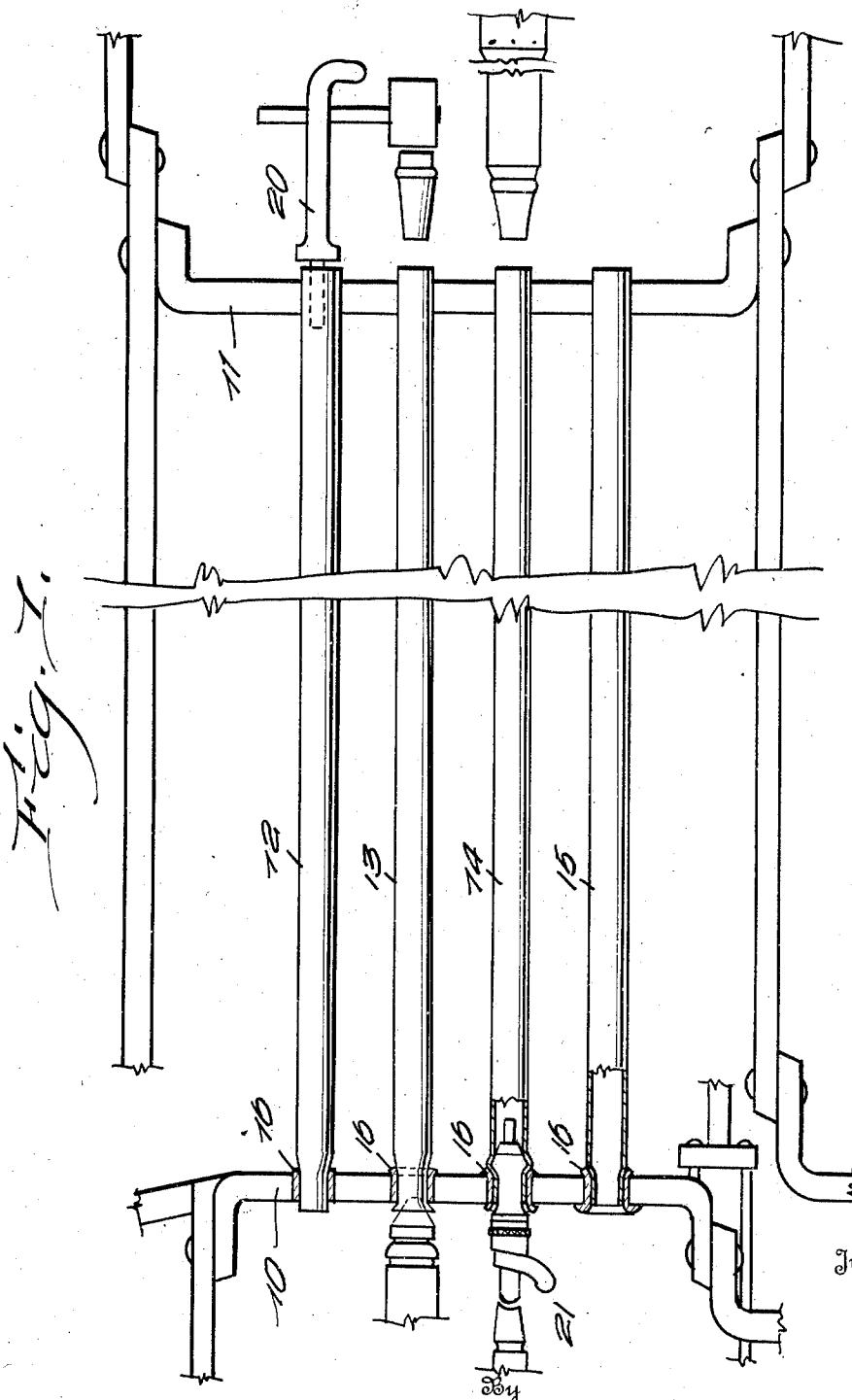

Fig. 1.

Inventor

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Fig. 2.

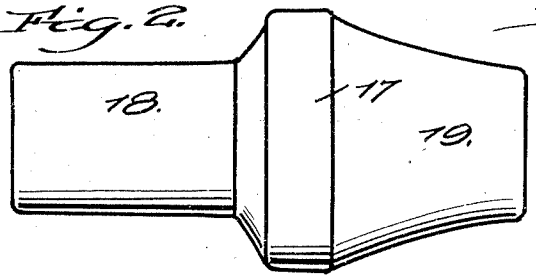


Fig. 3.

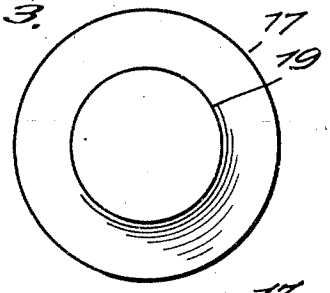


Fig. 6.

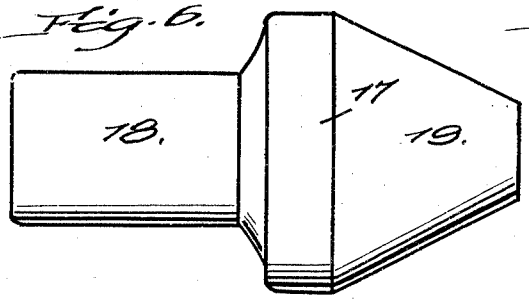


Fig. 7.

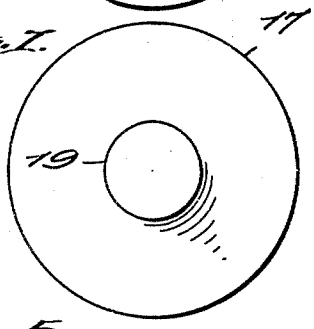


Fig. 4.

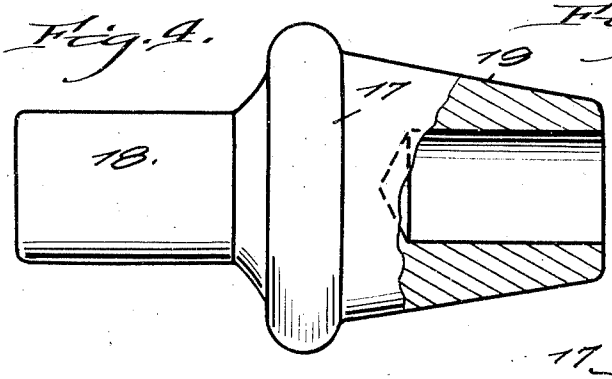


Fig. 5.

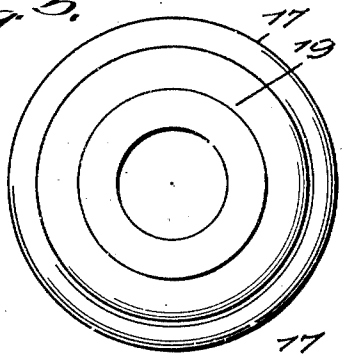


Fig. 8.

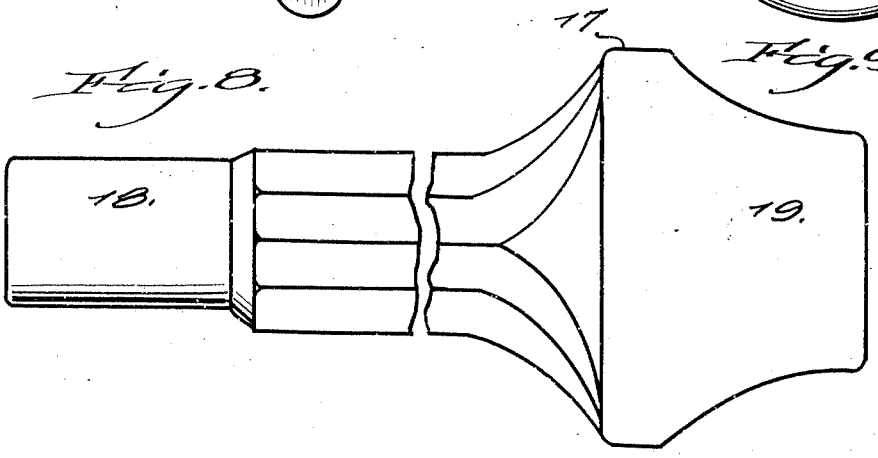
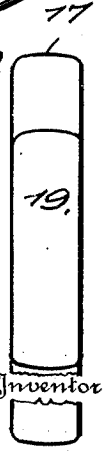


Fig. 9.



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Patented Mar. 26, 1929. 1,707,124

UNITED STATES PATENT OFFICE.

HARRY A. LACERDA, OF WATERVLIET, NEW YORK.

BOILER-MAKER'S TOOL.

Application filed December 1, 1925. Serial No. 72,539.

This invention relates to tools or implements of the class employed in constructing and repairing steam generators and the like, and has for one of its objects to provide a simply constructed implement to facilitate the securing of the flues in the flue sheets.

A more specific object of the invention is the provision of a tool of the character described which is adapted for use with a pneumatic hammer or like power device to simultaneously flare and set an end of a flue tube of a locomotive engine.

The embodiment of the invention is disclosed in the accompanying drawings in which:

Figure 1 is a sectional view of portions of a conventional steam generator including a section of the fire box flue sheet and the smoke chamber flue sheet together with a plurality of the flues, and a plurality of the improved tools employed for setting the flues in the flue sheet;

Figure 2 is an elevation, enlarged, of the improved tool;

Figure 3 is an end view of the part shown in Figure 2;

Figure 4 is a view, partly in section, illustrating a modification in the construction;

Figure 5 is an end elevation of the part shown in Figure 4;

Figure 6 is a view illustrating another modification in the construction;

Figure 7 is an end view of the part shown in Figure 6;

Figure 8 is a view illustrating another modification in the construction; and

Figure 9 is an end view of the part shown in Figure 8.

The same reference characters are employed in all of the views in the drawings.

In Figure 1 is shown a portion of a conventional steam generator to illustrate the operation of the improved implement, and including a portion of the fire box flue sheet at 10, a portion of the smoke chamber flue sheet at 11, and a plurality of the flues at 12, 13, 14 and 15.

The flue 12, is shown disposed in the flue openings in the flue sheets as first inserted with the usual copper ferrule or bushing at 16, before being rolled. The flue 13, is shown after flared and set, and ready for the rolling. The flue 14 is shown after being rolled, and the flue 15, is shown completely rolled and swaged.

The improved implement, which is the subject of the present application, comprises a stock or body, enlarged intermediate its ends to produce an impact flange, as shown at 17, and adapted to be subjected to an impacting and rolling force applied to the terminal or shank 18. The portion of the stock at the other side of the enlargement is reduced away from the enlargement to produce a combined centering and swaging or flanging member, as shown at 19, and preferably curved or concaved as shown more clearly in Figure 2. The centering and swaging member 19 and the flange 17 together constitute what may be termed the head of the tool and it will be observed by referring to the drawings that an annular external shoulder occurs at the juncture of the flange 17 and the member 19.

With an implement thus formed the operation of setting and flaring the flue ends in the flue sheets is materially improved and danger of splitting the flues obviated. This improved form of implement also obviates any tendency to breakage, avoids abnormal strain upon the impacting and rotating element, for instance, a pneumatic hammer, as the resistance on the relatively short shank is less than that exerted by the ordinary formed shank.

In practice the flue to be set and flared at the fire chamber end is held by a bucking up bar indicated at 20, from end movement against the force of the air hammer, or other impacting and rotating device, a portion of which is indicated at 21. After the flues are set and rolled at the fire chamber end they are flared and set at the smoke chamber end, by the same implement, as illustrated in Figure 1.

In Figure 6, a slight modification in the construction is shown consisting in forming the portion 19 uniformly tapered instead of curved, as shown in Figures 1 and 2.

In Figure 4, the portion 19 is shown with the central portion cut out to decrease the weight without decreasing the efficiency.

In Figure 8, the portion 19 is flattened, as shown in Figure 9, which form may be employed under certain circumstances, and enables the operator to enter the implement through the outer sheet wash-out plug opening, as will be obvious and will be found convenient for use in water tube generators. In practice when cutting the flues at the rotating wheel in the flue department, a relatively heavy burr remains on the interior of the flue, and this burr can be effectually removed

by employing the improved implement. By employing the device disclosed in Figure 4, the flue can be reamed out after being inserted in the flue sheet without danger of splitting the flue, and the device will be self-releasing after being used, and requires no lateral blows to release it.

Having described my invention, that which I claim to be new, and desire to procure by Letters Patent is:

1. A tool comprising a shank and a head at one end of the shank, said head having a flange at its inner end and a tapering combined centering and swaging member extending from the center of the flange at the side of the latter opposite to the shank and in axial alinement with the shank, said shank being adapted to be actuated by a pneumatic hammer or like power device and said centering and swaging member being adapted to enter and engage with an end of a locomotive engine flue tube so that said end of the tube will be simultaneously flared and set in an associated flue sheet when the tool is actuated by said power device.

2. In combination, a tool comprising a shank and a head at one end of the shank, said head having a flange at its inner end and a tapering combined centering and swaging member extending from the center of the flange at the side of the latter opposite to the shank and in axial alinement with the shank, said shank being adapted to be actuated by a pneumatic hammer or like power device and said centering and swaging member being adapted to enter and engage with an end of a locomotive engine flue tube so that said end of the tube will be simultaneously flared and set in an associated flue sheet when the tool is actuated by said power device, and a tool for engaging with the opposite end of said tube to prevent axial movement of the tube under the impact of said first named tool.

In testimony whereof I affix my signature.

HARRY A. LACERDA.