No. 656,425. Patented Aug. 21, 1900.

F. SCHILLING & J. SCHURZ.

APPARATUS FOR ENLARGING AJUTAGES OF METAL TUBES.

(Application filed Oct. 2, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG 1.

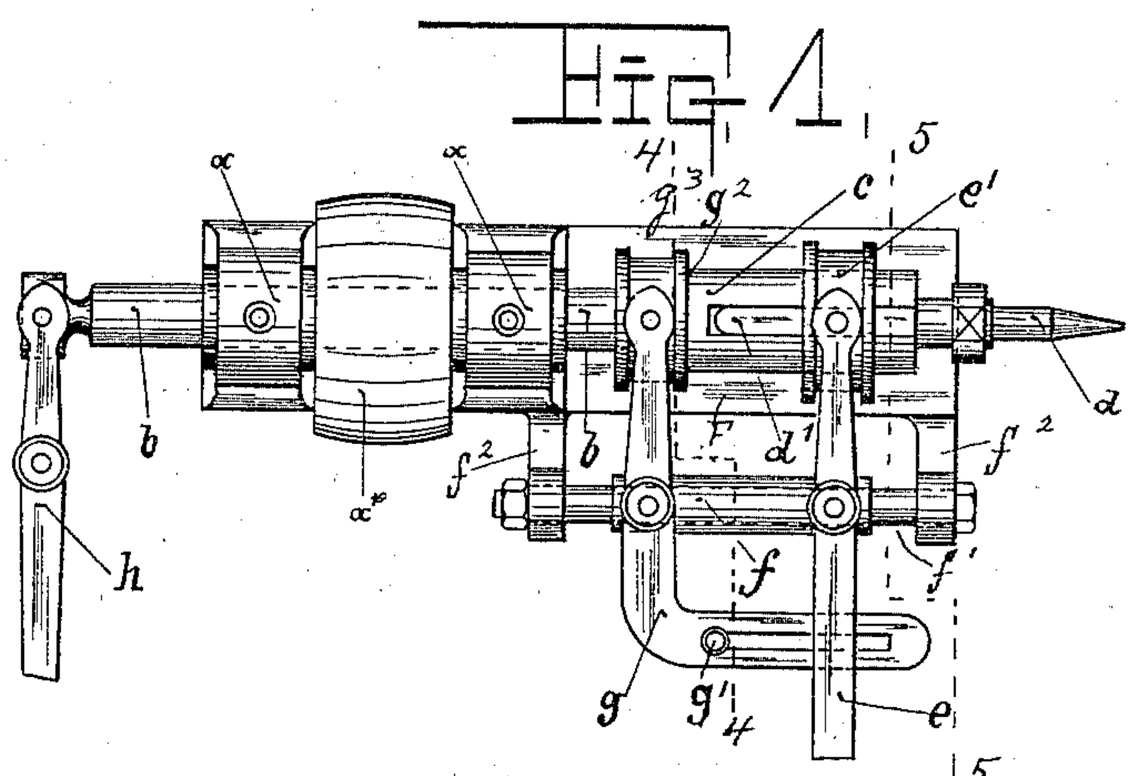

FIG 2.

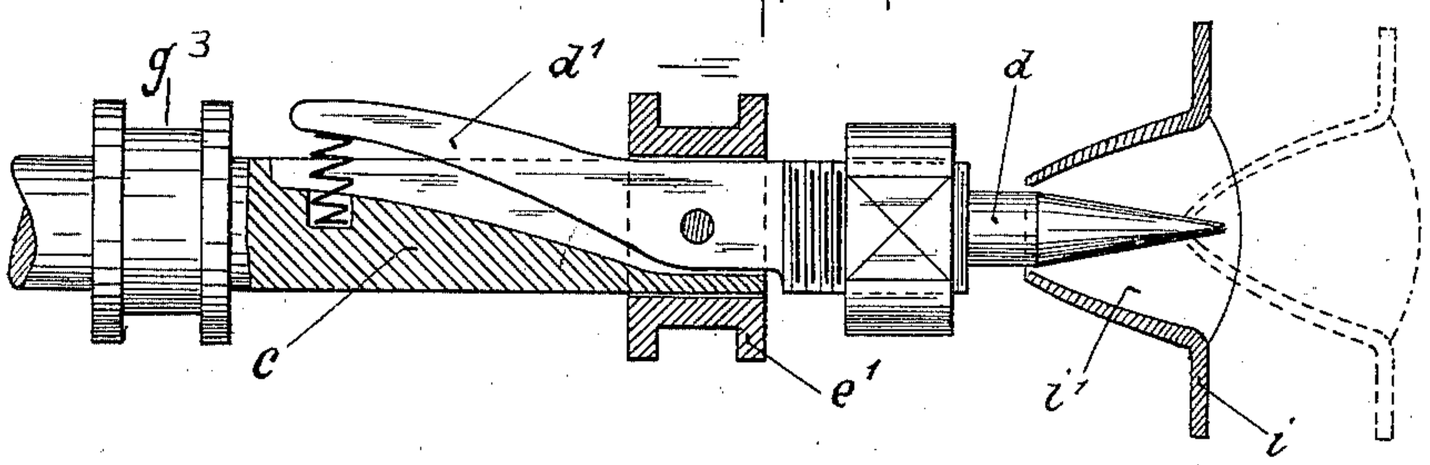

FIG 3.

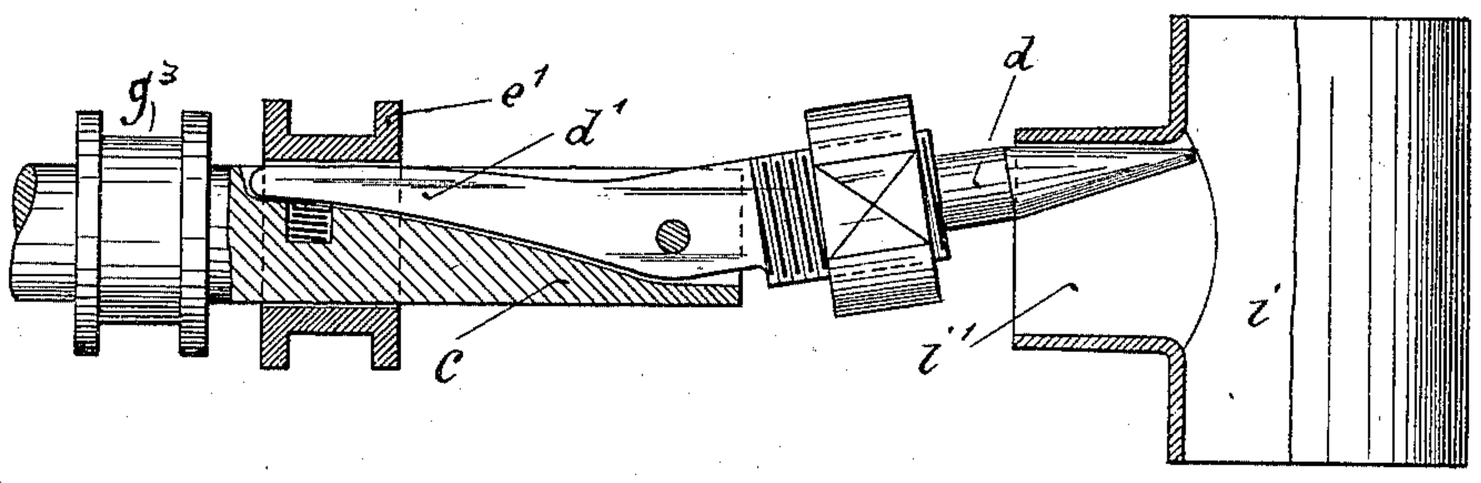

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FIG. 4.

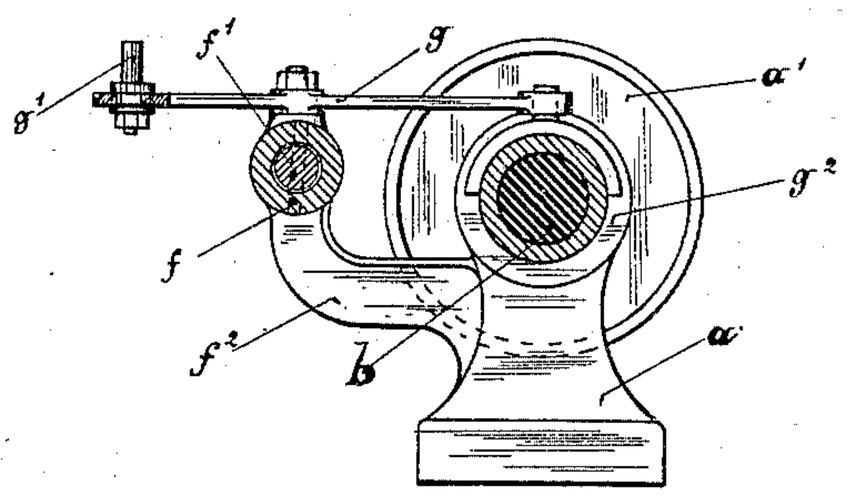
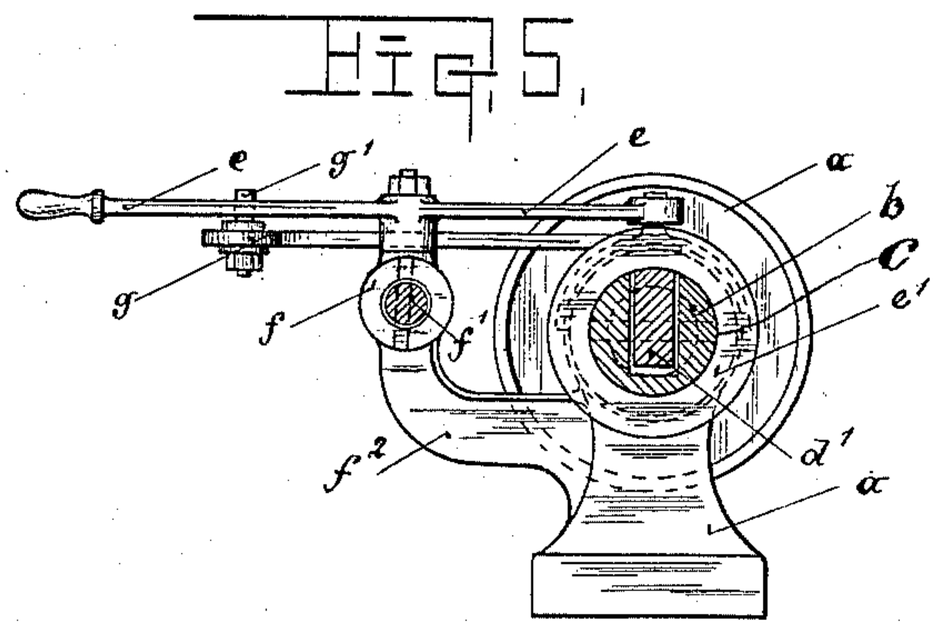


FIG. 5.



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UNITED STATES PATENT OFFICE.

FRITZ SCHILLING AND JOHANN SCHURZ, OF NUREMBERG, GERMANY.

APPARATUS FOR ENLARGING AJUTAGES OF METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 656,425, dated August 21, 1900.

Application filed October 2, 1899. Serial No. 732,374. (No model.)

To all whom it may concern:

Be it known that we, FRITZ SCHILLING and JOHANN SCHURZ, mechanicians, subjects of the King of Bavaria, residing at Nuremberg, Seuffertstrasse 10, in the Kingdom of Bavaria and German Empire, have invented certain new and useful Improvements in Apparatus for Enlarging Ajutages of Metal Tubes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for enlarging and calibrating metal ajutages from the conical form in which they are originally produced on metal tubes; and it consists in the apparatus hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is an elevation of the complete apparatus embodying our invention; Fig. 2, a sectional detail showing the enlarging or calibrating tool entering the ajutage in axial line; Fig. 3, a like detail showing said tool in a more advanced position of action with the ajutage practically calibrated; Fig. 4, an enlarged section on the line 4 4 of Fig. 1, and Fig. 5 a like section on the line 5 5 of Fig. 1.

Between bearings a is a pulley a', mounted on and driving a shaft b, which is capable of longitudinal adjustment. At one end of this shaft is a box or socket c, in which is pivoted the carrier of the calibrating-tool d, hereinafter termed the "expander." The working end of the expander is conical, the acuteness of the cone depending upon the diameter to which the ajutage is to be calibrated. The angular heel d' of the expander extends lengthwise of the box and is pressed outward by a spring, as shown, so that the expander tends normally to assume a position in axial line with the shaft. Embracing the end of the shaft and the tool-carrier is a sliding collar e', which when in position over the pivot of the carrier, as indicated in Fig. 2, serves, in conjunction with the box and the spring, to hold the expander in said axial position, but when slid back throws the expander out of said axial line to a degree depending upon the distance to which the collar is moved. This collar is shifted lengthwise of the shaft by means of a hand-lever e, pivoted upon sleeve f, which is fixed upon rod f', held fast in lugs f^2 from the bed-plate F. The hand-lever moves over the slotted bracket g, rigidly affixed to said sleeve f, and in the slot of which is placed an adjustable stop g', which may be set toward or from the hand-lever. Now if the shaft b be projected the resistance of the heel d' of the expander, forced outward by the spring, will at first cause the sleeve or collar e' to be carried along with it, swinging the hand-lever around until it comes in contact with the stop g', which will be so set as to contact with the lever at the moment that the lateral movement of the expander should begin to take place. Thereafter the further advance of shaft b and expander will cause the collar e' to travel relatively backward over the heel d', swinging the expander outward. The shaft b is moved lengthwise by a second hand-lever h, suitably pivoted. As already stated, a box c is formed at one end of the shaft in which the expanding-tool is pivoted. This box may be enlarged over the regular diameter of the shaft, as shown in Figs. 1 and 5, to afford shoulders g^2, behind which a peripherally-grooved collar g^3 is arranged to slide longitudinally on the shaft. This collar is embraced by a yoke from the bracket g, so that when the shaft is projected it will move relatively back therealong, but when retracted will come against the shoulders and serve as a stop.

The metal tube i, with the ajutage i' of conical form, is laid before the rotating expander d, as indicated in dotted lines in Fig. 2, and the shaft is then fed up toward it by means of the hand-lever h, carrying with it the axially-disposed expander, which pierces and distends it in a right line until the mouth is sufficiently opened, when, according to circumstances, the hand-lever may be manually operated to throw the expander gradually from the position represented in full lines in said figure to that shown in Fig. 3, or the stop g' may be so set as to accomplish this result concurrently with the gradual penetration. When the expander has fully calibrated the ajutage, the work is stopped and the shaft is retracted into position for a succeeding operation.

We claim—

1. The combination of the longitudinally-adjustable rotating shaft, the tool-carrier

with its angular heel pivoted in the end thereof, the conical calibrating-expander carried thereby, the spring acting on the heel of the expander-carrier, to force it toward an axial position, the sliding collar arranged to hold the expander in axial line with the shaft when over the pivot of its carrier, and means for shifting said collar to throw the expander out eccentrically.

2. The combination of the longitudinally-adjustable rotating shaft, the tool-carrier, with its angular heel, pivoted in the end thereof, the conical calibrating-expander carried thereby, the spring acting on the heel of the expander to force it toward an axial position, the sliding collar arranged to hold the expander in axial line with the shaft during its incipient entering and spreading movement, a hand-lever for shifting said collar, and a stop adjustable to limit the movement of said hand-lever under the forward play of the shaft.

In testimony whereof we affix our signatures in presence of two witnesses.

FRITZ SCHILLING.
JOHANN SCHURZ.

Witnesses:
AUX WIELE,
MAX SCHNEIDER.