

(No Model.)

R. WOOTTON & L. W. GOOLD.

APPARATUS FOR REMOVING MANDRELS FROM METAL TUBES.

No. 562,778.

Patented June 23, 1896.

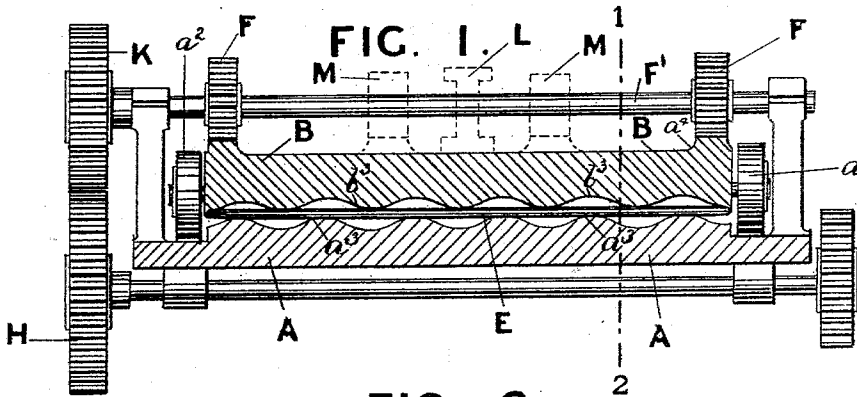


FIG. 2.

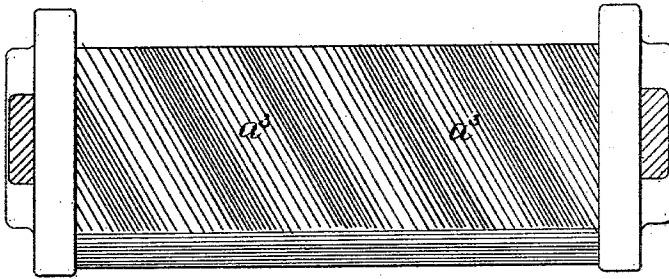


FIG. 3.

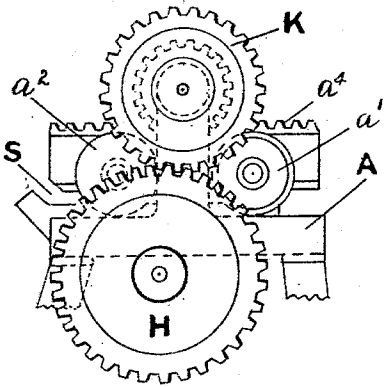
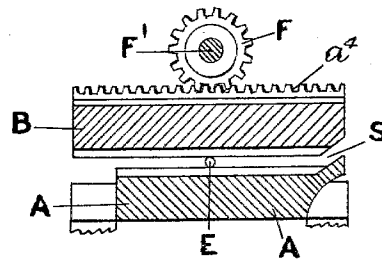


FIG. 4.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ROBERT WOOTTON AND LEWIS WILLIAM GOOLD, OF BIRMINGHAM,  
ENGLAND.

## APPARATUS FOR REMOVING MANDRELS FROM METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 562,778, dated June 23, 1896.

Application filed January 20, 1896. Serial No. 576,194. (No model.) Patented in England June 25, 1894, No. 12,270.

*To all whom it may concern:*

Be it known that we, ROBERT WOOTTON, gentleman, of 113 Harborne Road, Edgbaston, Birmingham, in the county of Warwick, England, and LEWIS WILLIAM GOOLD, architect and surveyor, of King's Heath, Birmingham, aforesaid, subjects of the Queen of Great Britain, have invented certain new and useful Apparatus for Removing Mandrels from Metal Tubes, of which the following is a specification.

The invention has been patented in England, No. 12,270, dated June 25, 1894.

Our invention relates to the manufacture of metal tubes and refers in particular to means for carrying out that portion of the process in which, after reducing the tube down upon a mandrel, the mandrel has to be withdrawn, and in doing which considerable difficulties have been experienced.

We form a machine consisting of two tables, the upper one being mounted upon rollers a little way above the other and mounted face to face, and so that the two faces are sufficiently apart when the upper table rests upon the rollers to exert pressure upon the thinnest tube required to be operated upon. The faces of the tables are provided with a series of corrugations or ridges, which run diagonally across the face, so that as a tube with its mandrel thereon is passed between the tables and one of the tables moved the tube is rolled all over its outer surface by the ridges and enlarged in its circumference, and the tube is not only enlarged but it is improved in quality. The table or tables may be reciprocated by any convenient mechanical means. After the enlargement the mandrel may be removed without difficulty. One or more than one tube and mandrel may be operated upon at the same time, and the operation may continue a shorter or longer period, as the quality and condition of the metal may require.

In order that our invention may be clearly understood and more easily carried into practice, we have appended hereunto a sheet of drawings, upon which we have fully illus-

trated the nature of our said improvements, together with the mode of and means for carrying the same into effect.

Figure 1 is a sectional front elevation through the bed of one of our machines. Fig. 2 is a sectional plan of the lower bed with the top part of machine removed. Fig. 3 is a side elevation of Fig. 1. Fig. 4 is a section through Fig. 1 on the line 1 2.

Our machine consists of two tables A and B, the upper one being mounted upon rollers  $a'$  and  $a''$  a little above the other and mounted face to face, so that the two faces are sufficiently apart when the upper table rests upon the rollers to exert pressure upon the thinnest tube required to be operated upon. The faces of the tables are provided with a series of corrugations or ridges  $a^3$  and  $b^3$ , which run diagonally across the face, so that as the tube E with its mandrel thereon is passed between the tables and one of the tables reciprocated the tube is rolled all over its other surfaces by the ridges and enlarged in its circumference, and the tube is not only enlarged, but it is also improved in quality. The table or tables may be reciprocated by any convenient mechanical means, such as the racks  $a^4$ , which are operated upon by the tooth-wheels F, the said tooth-wheels being mounted upon the shaft F', which is operated by the wheels K and H, or we may use cranks or eccentrics with connecting-rod in place of the wheels K and H to operate the shaft F' to give the required travel to the table, or the eccentric may be connected direct to a pin or support L from a vertical shaft to reciprocate the table B in a similar manner. A couple of rollers M may be provided for pressing upon the back of the top table to add pressure, in which case provision may be made to bring pressure to bear on the bearings of the shafts of such rollers, if required. Any suitable hopper S may be provided to allow of the tubes being fed in. After the enlargement the mandrel may be removed without difficulty. One or more than one tube E and mandrel may be operated upon at the same time and the operation may continue for a

shorter or longer period as the quality and condition of the metal may require.

We are aware that it has been previously proposed to free tubes from their mandrel after manufacture, and we do not claim such use generally; but

What we claim, then, is—

In combination, the upper and lower tables, with a space between them to receive the tube and its mandrel and means for moving and guiding one table in relation to the other one

of said tables having a corrugated surface, substantially as described.

In testimony that we claim the foregoing as our own we affix our names in the presence of two witnesses.

ROBT. WOOTTON.  
LEWIS WM. GOOLD.

Witnesses:

THOS. MEADOWCROFT,  
A. E. OCKFORD.