(No Model.)

J. P. SERVE.

APPARATUS FOR DRAWING TUBES.

No. 457,222. Patented Aug. 4, 1891.

FIG. 1

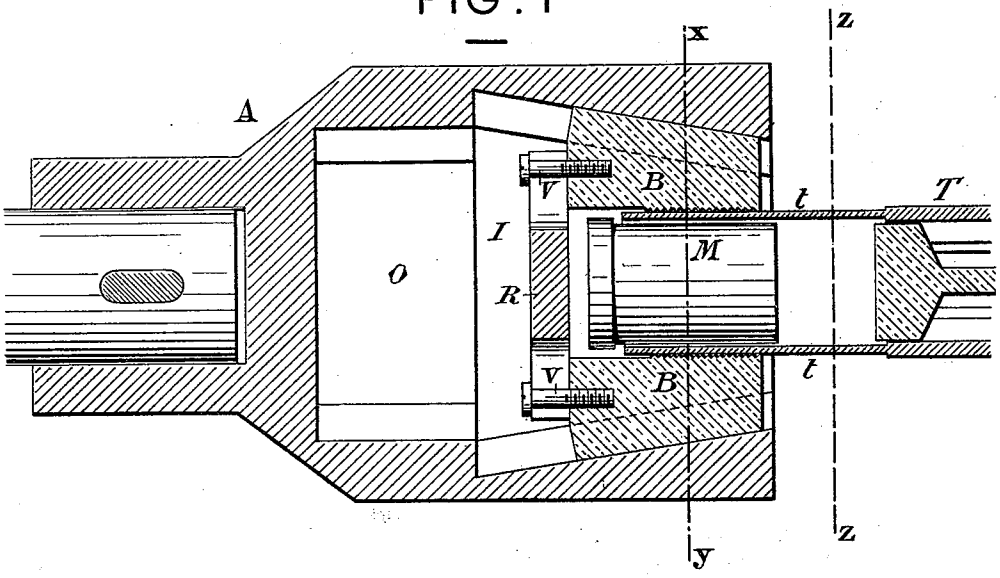


FIG. 2

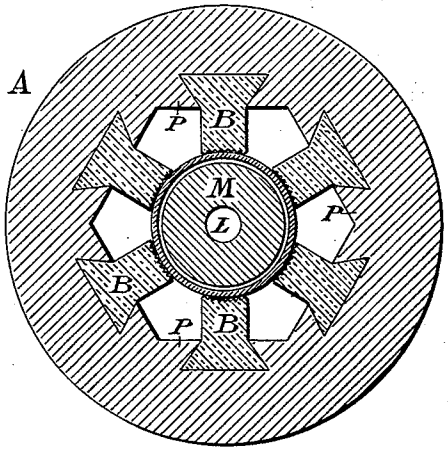
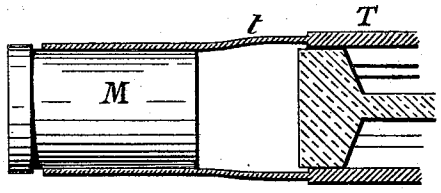


FIG. 3



Witnesses

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UNITED STATES PATENT OFFICE.

JEAN PIERRE SERVE, OF GIVORS, FRANCE.

APPARATUS FOR DRAWING TUBES.

SPECIFICATION forming part of Letters Patent No. 457,222, dated August 4, 1891.

Application filed August 7, 1889. Serial No. 320,044. (No model.) Patented in Belgium August 17, 1888, No. 82,932, and in France February 18, 1889, No. 196,141.

To all whom it may concern:

Be it known that I, JEAN PIERRE SERVE, manufacturer, a citizen of the Republic of France, and a resident of Rue des Servettes, Givors, (Rhône,) France, have invented certain new and useful Improvements in Apparatus for Drawing Metal Tubes, (for which I have obtained a patent in France, No. 196,141, dated February 18, 1889, and in Belgium, No. 82,932, dated August 17, 1888,) of which the following is a specification.

In the manufacture by drawing of ordinary tubes or smooth tubes, generally made without a longitudinal weld, one of the extremities of the same is previously contracted so as to form a sort of point, designed on the one hand to facilitate the introduction of the tube into the draw-plate and on the other hand to form a resistant part which is seized by the tongs of the draw-bench. Under these circumstances, the interior mandrel used in drawing is always introduced into the tube from behind, and is kept in position by means of a rod fixed to the extremity opposite to the draw-plate. With the tubes having interior longitudinal projections or ribs it is very difficult to introduce the mandrel from behind, and it is preferable to insert it from the front; but if the extremity of the tube has been contracted, as above stated with regard to smooth tubes, it is needful to previously cut off the contracted part for introducing the mandrel, and as this operation must be repeated at each pass considerable waste is occasioned. For completely obviating this waste I employ in the drawing operation the apparatus hereinafter described, which performs the duty of tongs, and serves also for successively contracting the ends of the tubes at each fresh pass through the draw-plate.

In the accompanying drawings, Figure 1 is a longitudinal section taken through the axis of the improved apparatus and shows a tube T to be drawn, which tube is put in the said apparatus, but has not yet been contracted by the pressing action of the grippers B, hereinafter referred to. In this figure the line Z Z indicates the position of the draw-plate. Fig. 2 is a transverse section taken on the line Y Y of Fig. 1. Fig. 3 shows the tube contracted once by the apparatus.

I provide the so-called "tongs" A in their interior I with a certain number (three, four, five, six, or more) of guides P, which are all at the same inclination in the longitudinal axis of the tongs. An equal number of grippers having inclined surfaces corresponding to those of the guides above mentioned are adapted to slide in the latter, so that the line of pressure of these grippers is constantly kept parallel with the said axis. As will be seen, this sliding movement causes the pressure to be produced regularly upon the whole part of the end of the tube T which is in contact with the grippers B. These grippers are connected with each other at their front part by a plate R. To enable the grippers to be dismounted and changed and removed from the tongs A, openings O are provided in the sides of the latter. The screws V, connecting this plate R with the several grippers B, can also be readily inserted and removed. These grippers are made wide enough for almost completely surrounding the tube when they compress it.

The end of the tube, which must first enter the draw-plate, is not at all contracted for forming what is called a "point," and the drawing is effected in the following manner: After the tube has been turned interiorly and exteriorly a certain length, as shown at T, Figs. 1 and 3, I introduce into it the mandrel provided with a rod, which latter is indispensable for effecting the drawing operation. This introduction is effected at the end which is to pass first into the draw-plate, care being taken to insert the mandrel a sufficient length—say from ten to fifteen centimeters—which may, however, be slightly varied according to the form of the head of the draw-bench. In order to prevent the tongs from crushing the end of the tube I introduce into the same at each pass a filling-cylinder M of suitable metal, the diameter of which gradually diminishes, and is such that the end of the tube, when contracted by the grippers so as to make a joint above, shall be ready to pass into the draw-plate for the following pass. The length of the cylinders is such that they extend slightly beyond the end of the tube, which permits them to be readily withdrawn after the pass. These cylinders M have an exterior surface, which is either smooth or

provided with longitudinal grooves for receiving the ribs, in case these are only made lower instead of being removed entirely. These cylinders M are pierced in their longitudinal direction with an axial hole L to prevent a vacuum being produced in the interior of the tube during the drawing operation. From this it follows that if at each pass of the tube I introduce a counter-pressure mandrel of a smaller diameter than that of the tube, grippers B, when pressing the end of the tube T for drawing the same, will contract it at the same time sufficiently for enabling this end of the tube to pass into the draw-plate for the following pass, which draw-plate, when tubes are drawn according to the method mostly employed, is always of a smaller diameter than that of the draw-plate for the preceding pass. It will be observed that this contraction takes place from the commencement of the drawing of the tube by the direct action of the grippers upon the end of the tube which is in contact with them. Accordingly the end of the tube is prepared for passing into the following draw-plate, which has a smaller diameter than that for the preceding pass.

The form of the tongs represented in the accompanying drawings may of course be modified according to the thickness of the tubes to be drawn. It may present interiorly a variable number of inclined guides and grippers adapted to slide in the guides so as to produce the pressure in the manner hereinbefore set forth.

Having thus described my invention, what I claim is—

1. In an apparatus for drawing metal tubes, the combination, with the draw-plate Z and the mandrel, of the tongs provided with the transverse opening O, the internal series of separated guides having their surfaces inclined to the axis of the tongs, and the grippers having corresponding surfaces and interlocked with and adapted to slide upon the inclined surfaces of the separated guides, said grippers automatically and simultaneously advancing and gripping the tube by the drawing movement of the tongs' head, substantially as described.

2. The means herein described for drawing metal tubes, consisting of tongs provided with the transverse opening O, the internal series of separated guides having their surfaces inclined to the axis of the tongs, the grippers having corresponding surfaces and interlocked with and adapted to slide upon the inclined surfaces of the separated guides, a plate R at one end of the grippers, and screws V, detachably connecting the plate to the grippers, said plate, screws, and grippers being removable through the transverse opening, substantially as described.

3. The combination of the tongs provided interiorly with a series of separated guides having their surfaces inclined to the axis of the tongs, and grippers having corresponding surfaces and interlocked with and adapted to slide upon the inclined surfaces of the separated guides of filling-cylinders M of various diameters, smaller sizes of which are successively placed at the extremity of the tube to be seized, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JEAN PIERRE SERVE.

Witnesses:
GEORGES FREYDIER DUBREUL,
XAVIER JANICOT.