

J. REIMANN.

DIE FOR THE MANUFACTURE OF METAL TUBES OR PIPES.

APPLICATION FILED JAN. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

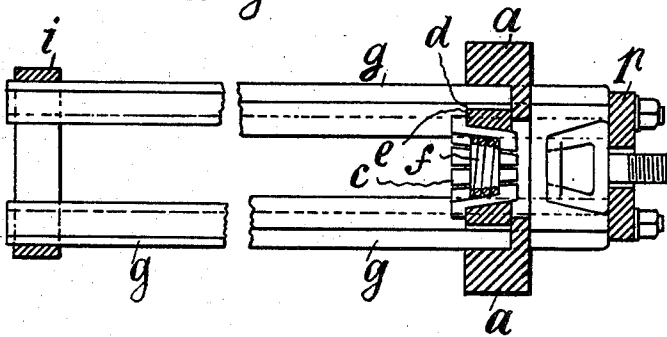


Fig. 2.

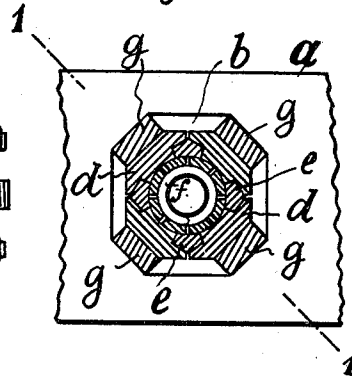
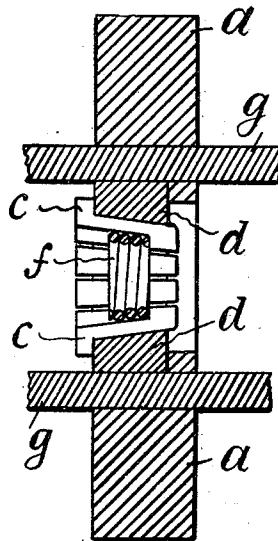


Fig. 3.



Witnesses:
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 G. L. Neule.

Inventor:
 Jacques Reimann
 By Honson & Honson
 Atty.

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2 SHEETS—SHEET 2.

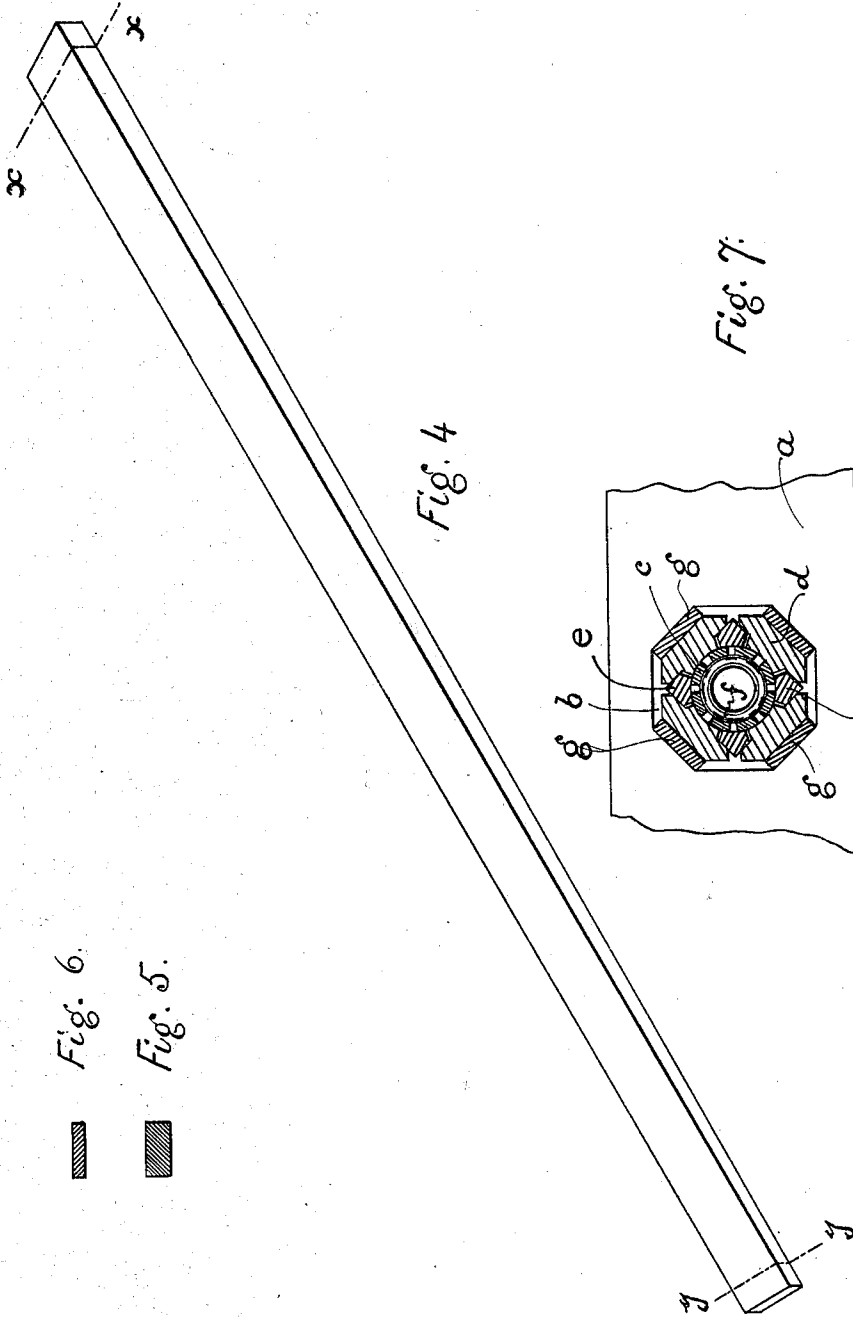


Fig. 6.

Fig. 5.



WITNESSES

W. Wright
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INVENTOR

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BY *Howson and Howson*

ATTORNEYS

UNITED STATES PATENT OFFICE.

JACQUES REIMANN, OF PLASMARL, NEAR SWANSEA, ENGLAND.

DIE FOR THE MANUFACTURE OF METAL TUBES OR PIPES.

SPECIFICATION forming part of Letters Patent No. 732,960, dated July 7, 1903.

Application filed January 21, 1903. Serial No. 139,864. (No model.)

To all whom it may concern:

Be it known that I, JACQUES REIMANN, foreman, a citizen of the Republic of Switzerland, residing at Plasmarl, near Swansea, England, have invented a new and useful Die for the Manufacture of Metal Tubes or Pipes, of which the following is a specification.

My invention relates to improvements in die-plates which are used for the manufacture of conical bodies, especially taper tubes or pipes; and the objects of my improvements are, first, to reduce friction in the die, and, second, to permit the die to expand as the pipe or tube passes through it, so as to result in the formation of a tapering tube or pipe. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a lengthwise section of the die-plate and accompanying appliances, and Fig. 2 a cross-section thereof. Fig. 3 is a lengthwise section of the die-plate on line 1 1 of Fig. 2 on a larger scale. Fig. 4 is a perspective view of a wedge. Fig. 5 is a sectional view of the wedge on line *xx*, Fig. 4. Fig. 6 is a similar view on line *yy*; and Fig. 7 is a view similar to Fig. 2, but with the wedge drawn through and the die expanded.

Similar letters refer to similar parts in all the figures.

In the figures, *a* is a die-plate with an opening *b*, (in this case octagonal,) in the middle of which there is a conical bush *c*, held by two concentric sets of guide-pieces *d* and *e*, lying close together, each with radial joints and in the example each set consisting of four parts. In the tapering bush *c*, which is radially split in eight parts, there is a die-ring proper, *f*, made of spirally-wound wire or rod. The adjacent sections of the bush *c* press with their tapering backs against the inner surfaces of the guides *d* and *e*, and their joints are set staggering or "breaking" with those of the guides, so that each section of two backs against the inclined cheeks or adjusted wedges *g*, which have rectangular cross-sections and the front or outer ends of which lie in the octagonal orifice of the die-plate *a*. These adjusting-wedges *g* are somewhat longer than the pipe or tube or other body that is to be produced and have the same taper that this tube or the like is to

have. They are united with the draw-head *h*, which effects the drawing through of the pipe in the usual way. At their ends farthest from the die-plate *a* the wedges are preferably held together by a band *i*.

The parts of the device are shown in position to begin the drawing operation. If the tube or pipe or the like is drawn to the right through the expansible die-ring *f*, the first end which goes through receives the diameter corresponding to the smallest internal diameter of this ring. At the same time with the pipe the adjusting-wedges *g* are drawn forward, so that the space occupied by them in the die-plate becomes gradually smaller and smaller, permitting the pipe or the like to press apart the guide-pieces *d* and *e* and allowing the threaded die-ring *f* to enlarge, so that the orifice of this ring proper becomes larger and larger. According as the wedge *g* is constantly or variably tapering, the pipe or the like will be drawn with constant or with varying taper.

In place of wedges *g* having the same length or a greater length as the pipe or the like short wedges with a greater tapering may be used, and this wedge may be moved with a reduced speed by means of screw *g*, gears, or the like to form the desired conical shape.

In place of wedges *g* can be employed other methods by which the jaws *d* and *e* can be made to approach each other or to recede from each other radially, for instance, adjusting-screws actuated by gear-wheels. The number of jaws *d* and *e* can naturally be greater or smaller than four each without essentially affecting the principle of the invention.

Instead of making the die-ring of specially-wound wire or rod it can be made of several superposed elastic split rings, which must, however, be held in such relation to each other that one full or unbroken part of one ring will always be covered by the split or broken part of the adjacent ring, so that in drawing there will always be a full profile.

The effect of the above invention is not only to markedly reduce friction between the pipe or the like and the die-ring, but to enable the drawing of taper tubes or pipes or other conical bodies by providing for a gradual receding from the lengthwise axis of the device

of the sections of the bush which receives the die-plate proper.

I claim as my invention—

- 5 1. A die for the manufacture of conical bodies, comprising a die-plate, an expansible die-ring therein, wedges adapted to hold said ring within the plate, and means to move said wedges through the die to permit the expansion of the ring, substantially as described.
- 10 2. A die for the manufacture of conical bodies, comprising a die-plate, an expansible die-ring therein, and wedges adapted to prevent the expansion of said ring, said wedges being adapted to be moved through said die at the same time with the body being drawn, and said wedge decreasing in size from the forward end toward the rear, substantially as and for the purpose described.
- 15 3. A die for the manufacture of conical bodies, comprising a die-plate, a tapered bush therein and a spiral die-ring within the bush, wedges between the bush and the plate adapted to be moved transversely through the die during the process of manufacture, substantially as described.
- 20 25

4. A die for the manufacture of conical bodies, comprising a die-plate, a spiral die-ring, a split tapered bush surrounding the ring, radially-movable guides for the bush and wedges adapted to limit and control the degree of expansible motion to be imparted to the die, bush and guides during the process of manufacture, substantially as described.

5. A die for the manufacture of conical bodies, comprising a die-plate, a spiral die-ring, a split tapered bush surrounding the ring, radially-movable guides for the bush and wedges adapted to limit and control the degree of expansible motion to be imparted to the die, bush and guides during the process of manufacture, each of said wedges adapted to control several of the said guides, substantially as described.

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

JACQUES REIMANN.

Witnesses:

WILLIAM D. REES,
H. L. SMITH.