

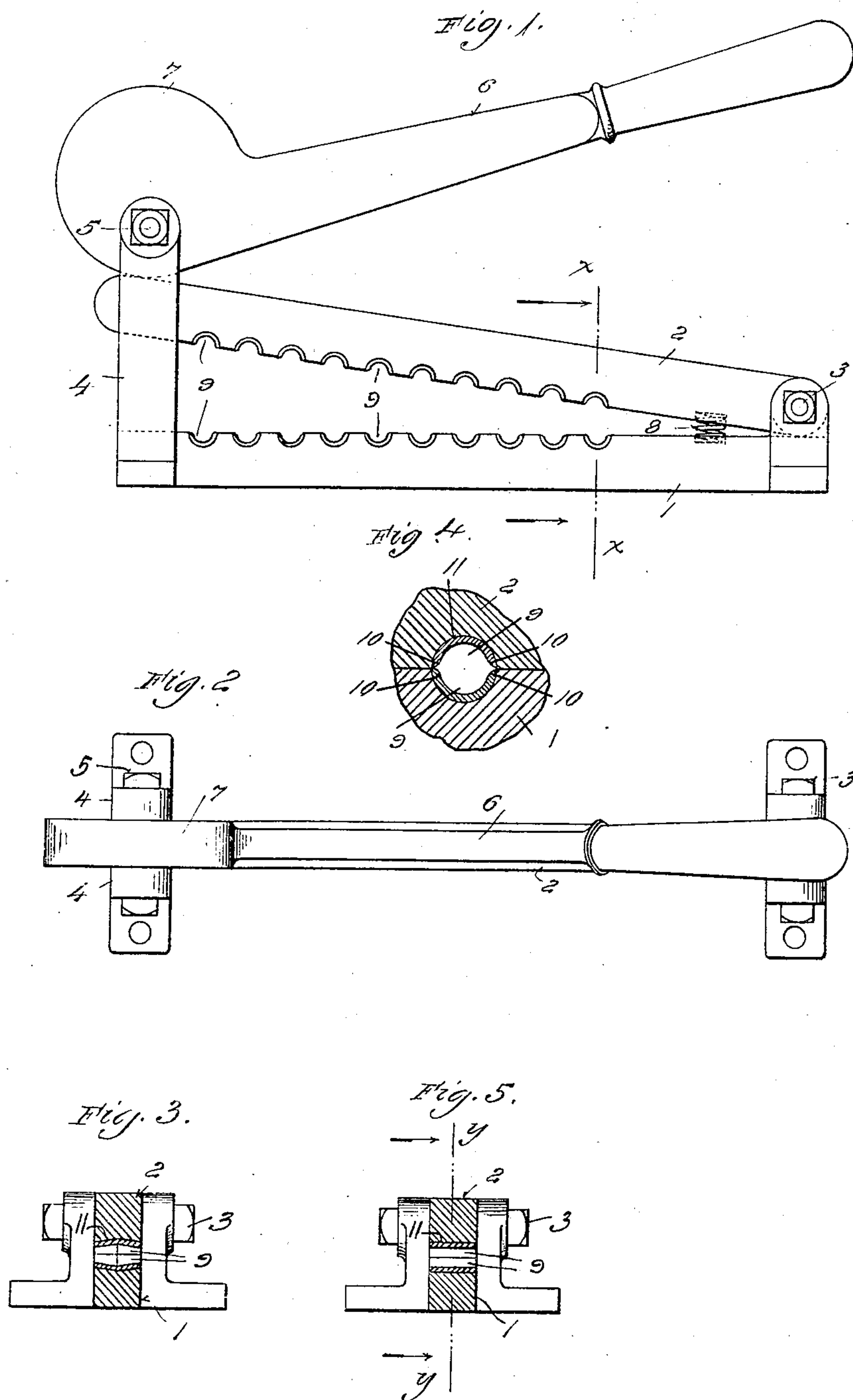
No. 765,825.

PATENTED JULY 26, 1904.

M. O. FELKER.
SWAGING TOOL.

APPLICATION FILED JAN. 12, 1903.

NO MODEL.



WITNESSES:

J. C. Dawley.

Will O'Loughlin

INVENTOR

Melanchthon O. F. Parker

BY

H. A. Graham
ATTORNEY.

UNITED STATES PATENT OFFICE.

MELANCTHON O. FELKER, OF CHICORA, PENNSYLVANIA.

SWAGING-TOOL.

SPECIFICATION forming part of Letters Patent No. 765,825, dated July 26, 1904.

Application filed January 12, 1903. Serial No. 138,629. (No model.)

To all whom it may concern:

Be it known that I, MELANCTHON O. FELKER, a citizen of the United States, residing at Chicora, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in Swaging-Tools, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to swaging-tools, and has for its object to provide a construction whereby hollow cylindrical ferrules or metal sleeves—such as are used, for instance, in repairing whips—may be reduced in diameter or upset by a cold-swaging process in a rapid and effective manner without injuring the article to be swaged.

To this end my invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a tool embodying my invention in one form. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view taken on the line *xx* of Fig. 1 and looking in the direction of the arrows, but showing the die-plates closed. Fig. 4 is an enlarged detail sectional view taken on the line *yy* of Fig. 3 and looking in the direction of the arrows; and Fig. 5 is a view similar to Fig. 3, illustrating a different form of die-recess.

In carrying out my invention I employ two die-plates 1 and 2, which are relatively movable, and in the present instance I have shown one of these die-plates (marked 1) as a fixed plate forming the base of the tool, while the other die-plate, 2, is movable toward and from the fixed die-plate. This relative movement may be effected in any suitable manner—as, for instance, by hinging the die-plate 2 to the die-plate 1 at one end of the two plates, as indicated at 3, the other die-plate, 1, being provided at its other end with parallel vertical standards 4, between which the free end of the die-plate 2 travels. These standards at their upper ends are provided with bearings for the axis 5 of a cam-lever 6, having a cam or eccentric 7, which bears on the upper side of the movable die-plate 2. A lift-spring 8, which may be interposed between the die-

plates, as shown, tends to lift the movable die-plate and hold it against the cam 7, moving it upward when the pressure of the cam is removed. The means for supporting and actuating the die-plates may, however, be of any suitable construction.

The meeting faces of the die-plates are provided with a series of pairs of die-recesses 9, formed one-half in each plate, and each die-recess of each pair is approximately semicircular in cross-section, so that when the two recesses of any given pair are united they form a complete recess. These die-recesses extend entirely across the faces of the plates and are thus open at each end. As just stated, a series of these recesses is formed in the two plates, the recesses decreasing gradually in diameter, each recess being, say, one thirty-second of an inch smaller than the preceding one and the number of recesses being sufficient to effect the desired reduction. It will be observed, however, that the half-recesses are not exactly semicircular in cross-section. If they were so constructed, each half-recess would where it joins the face of the die-plate form a sharp angle or corner. The half-recesses are so formed at the junction of their walls with the face of the die-plate that a reverse curve 10 unites the cylindrical inner surface of the recess with the plane surface of the face of the die. It results from this construction that in the process of swaging the metal of which the sleeve or ferrule operated upon is composed cannot be pinched between the sharp angles or corners which would exist were the die-recesses truly semicircular in section; but, on the contrary, no pinching of the metal or marring of the surface thereof occurs.

It will be understood that the sleeve or ferrule is operated on when in a cold or unheated condition, and the spaces at the opposite sides of the complete die-recesses, which spaces are formed by the reverse curves just referred to, are sufficiently small to prevent the metal from flowing into said spaces, and thereby marring the uniformity of the outer surfaces of the sleeve or ferrule.

A further feature of my invention consists in providing each die-recess with a lining or

facing 11, of relatively soft metal, such as soft brass or soft steel, according to the character of the material to be operated upon. By the word "relative" I mean that the working face of the die-recess shall be of a metal softer than that of which the article operated on is composed or softer than that of any plating or covering metal which may form the exterior surface of the said article. This prevents in an obvious manner the marring of the surface of the article operated on by the pressure of the die thereon.

The reverse relieving curves hereinbefore referred to are preferably formed by rounding off the edges of the soft-metal linings, as shown in Fig. 4, this being readily effected, owing to the character of the material.

Although capable of other applications, the tool is primarily designed for swaging down certain metallic ferrules or sleeves employed for uniting the parts of whips, and in performing this operation the parts to be united are inserted in the ferrule or sleeve and the ferrule is then placed in that one of the pairs of recesses which is adapted to give it its first reduction. The die-plates are then pressed together, thus effecting a partial swaging down or reduction of the ferrule, which is then removed to the next smaller recess and the operation repeated. By means of successive reductions the ferrule is thus swaged down until it grips the parts to be united with sufficient firmness to effect a permanent joint. As hereinbefore stated, these ferrules would be pinched and marred unless the corners of the dies be relieved in the manner hereinbefore set forth by the reverse curves 10. Furthermore, as these ferrules are usually constructed of brass and frequently plated or coated with nickel or some other ornamental and protective metal covering the making of the die-surfaces of a relatively softer metal prevents injury to the outer surface of the ferrule.

Where the ferrule to be swaged is tapered, as is usually the case, the die-recesses are correspondingly tapered, as shown in Fig. 3,

where a recess diminishing in diameter toward each end is shown. The recesses may, however, be cylindrical, as shown in Fig. 5.

I do not wish to be understood as limiting myself strictly to the precise details hereinbefore set forth, and shown in the accompanying drawings, as it is obvious that these details may be modified without departing from the principle of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a swaging-tool for cold-swaging metallic ferrules, die-plates having formed in their meeting faces opposite half-recesses, said recesses being provided with a facing or lining of a relatively soft metal, the inner face whereof is mainly semicircular in cross-section, their curved surfaces being united to the face-surfaces of the plate by reverse relieving curves formed by rounding off the edges of the soft-metal lining, substantially as described.

2. A tool for cold-swaging metallic ferrules, comprising two die-plates, a spring acting to separate said plates, and means for forcing said plates together, said die-plates having formed in their meeting faces a series of pairs of opposite half-recesses of successively-decreasing diameter, said half-recesses being mainly semicircular in cross-section, and having their curved surfaces united to the face-surfaces of the plate by reverse relieving curves, said recesses being provided with a facing or lining of a relatively soft metal, and the lateral spaces formed by the relieving curves being sufficiently small to prevent the entrance of the metal operated upon, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MELANCTHON O. FELKER.

Witnesses:

J. M. STEINBROOK,
G. J. MYERS.