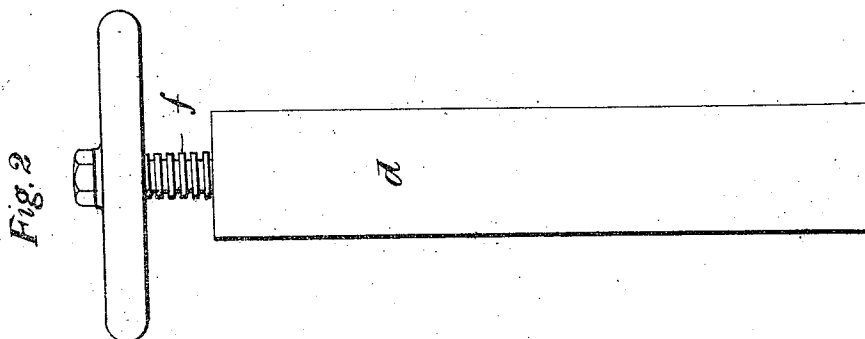
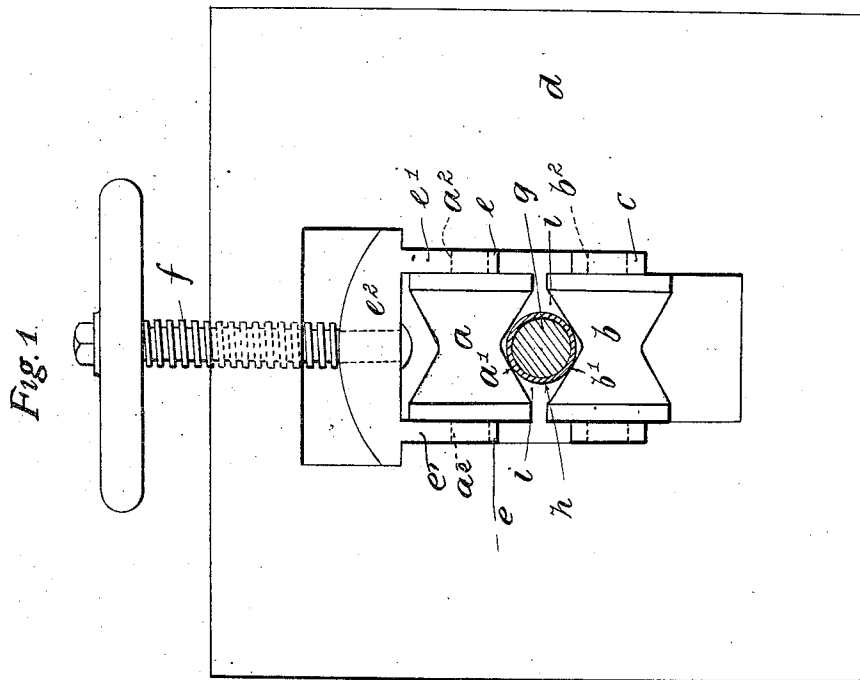


(No Model.)

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No. 577,296. Patented Feb. 16, 1897.



WITNESSES
Thos. A. Green
Robert Bennett

INVENTORS
Robert F. Hall.
Frederick Warwick
Thomas Smith.
By James L. Norris, atty.

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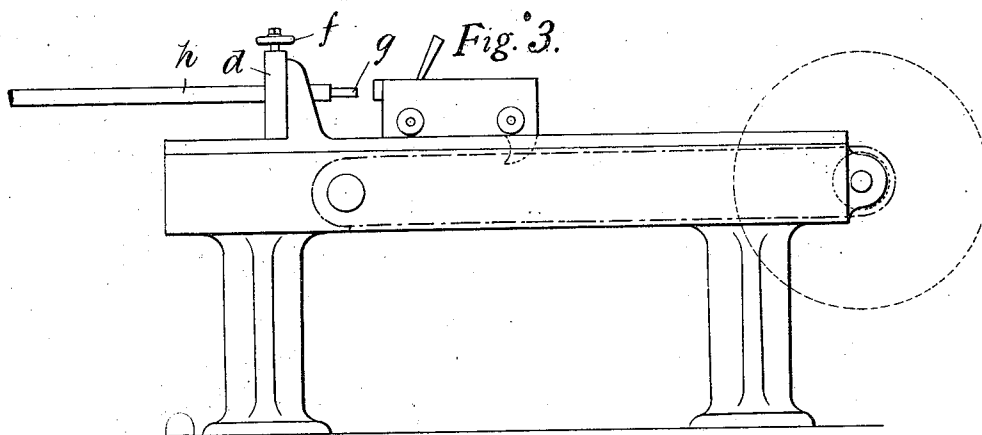
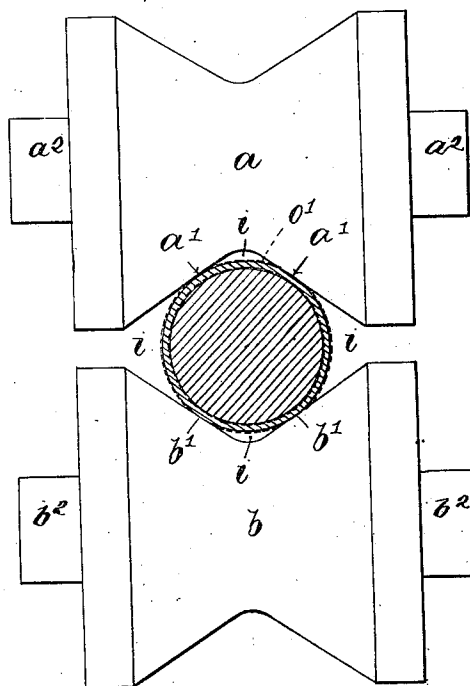


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

ROBERT F. HALL, FREDERICK WARWICK, AND THOMAS SMITH, OF
BIRMINGHAM, ENGLAND.

MEANS FOR REMOVING SEAMLESS TUBES FROM MANDRELS.

SPECIFICATION forming part of Letters Patent No. 577,296, dated February 16, 1897.

Application filed June 1, 1896. Serial No. 593,876. (No model.)

To all whom it may concern:

Be it known that we, ROBERT FREDERICK HALL, of Sherlock Street, in the city of Birmingham, FREDERICK WARWICK, of the "Dingles," Shirley, near Birmingham, and THOMAS SMITH, of Wharf Street, Aston, near Birmingham, England, have invented certain new and useful Improved Means for Removing Seamless Steel Tubes from Mandrels, of which the following is a specification.

This invention relates to an improved and simplified machine for removing seamless steel or other tubes from their mandrels.

In manufacturing weldless steel tubes produced upon solid mandrels it is difficult to withdraw the tube from off the mandrel, or to remove the mandrel from the tube, and this is done often at a great risk of injuring the constitution of the metal from which the said tube is made. The removal is usually accomplished by what is known as a "reeling-machine," which rotates the tube and mandrel together and by applied pressure slightly spreads or increases the internal diameter of the tube formed and thereby loosens the same on the mandrel, when the said tube can be easily withdrawn.

The removal of thin gage-tubes (such as are usually used in cycle-work) is fraught with difficulties on account of the liability of the same to be externally injured and scratched, and oftentimes they burst.

According to our improvements the walls of a drawn tube are loosened from its mandrel by a straight rolling process, which consists in passing the tube while on the mandrel between two counterpart rolls, one of which is mounted directly above the other, and each roll having a V-shaped groove in its periphery, so that the walls formed by the said grooves will bear against the tube at four distinct and separated points to secure four distinct clearance-spaces, which admit of the flowing of the metal displaced, it being understood that this is accomplished with a single pair of rolls.

In order to enable others skilled in the art to make, use, and practice our invention, we will now proceed to describe the same in detail, reference being had for this purpose to the accompanying drawings, in which—

Figure 1 represents a front elevation of a

bolster or frame having journaled therein a pair of rolls constructed in accordance with the nature of this invention and showing also a mandrel and tube in section located in position between said rolls. Fig. 2 is a side elevation of the bolster or frame shown in Fig. 1. Fig. 3 represents a side view of the bolster or frame applied to an ordinary draw-bench; and Fig. 4 represents, on an enlarged scale, a section of the two rolls with the tube and mandrel coming between them.

The same letters of reference indicate corresponding parts in the various figures.

The letters *a* and *b* indicate a pair of rolls located one above the other and each having a V-shaped groove in its periphery forming the inclined walls *a' a'* and *b' b'*. The upper roll *a* is provided with axles or journals *a² a²*, which are mounted to run freely within the bearings *e*, formed in the ends *e'* of an adjustable stirrup *e²*. This stirrup is arranged to slide vertically in guides formed in the bolster or frame *d*, and may be adjusted to various heights with respect to the lower roll by means of the hand-screw *f*. The lower roll *b* is provided with similar axles or journals *b² b²*, which are loosely mounted in the bearings *c*, formed in or carried by the bolster or frame *d*.

The reference-letter *g* indicates a bar or mandrel, and *h* is the tube, formed upon said mandrel, and which is to be loosened and removed as follows: The tube and mandrel are forced or drawn through the substantially angular space formed between the two rolls by the inclined walls *a' a'* and *b' b'*, said tube coming in contact with the said inclined walls at four separate and distinct points, as shown, and between each pair of contact-points is a clearance-space *i* (four in all) to admit of the expansion or flow of the displaced metal. The bore of the tube is thereby slightly enlarged, so as to admit of the same being easily stripped from the mandrel.

It is to be noted that the tube is acted upon at four separate and distinct points by the single pair of rolls, this being accomplished by the peculiar shape of the groove in the periphery of said rolls.

We are aware that it is broadly old to provide an apparatus for removing tubes from their mandrels wherein the tubes are acted

upon on four different sides by two pairs of rolls, one pair being arranged at right angles to the other pair, and each roll having a concaved groove in its periphery. By our invention we dispense entirely with one pair of such rolls and accomplish the same result with a single pair of peculiar construction.

What we claim is—

A machine for releasing a tube from a mandrel, consisting of two counterpart rolls journaled one above the other and each having a V-shaped groove in its periphery, the walls of which bear against the tube at four dis-

tinct and separated points to secure four distinct clearance-spaces with the single pair of rolls, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

R. F. HALL.
FREDERICK WARWICK.
THOMAS SMITH.

Witnesses:

ARTHUR T. SADLER,
R. T. MOYAN.