

(No Model.)

3 Sheets—Sheet 1.

R. CHILLINGWORTH.
MEANS FOR FINISHING TUBULAR SOCKETS.

No. 595,938.

Patented Dec. 21, 1897.

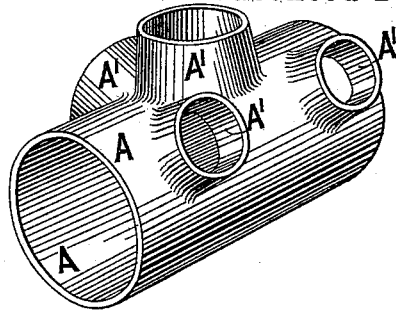


FIG. 1.

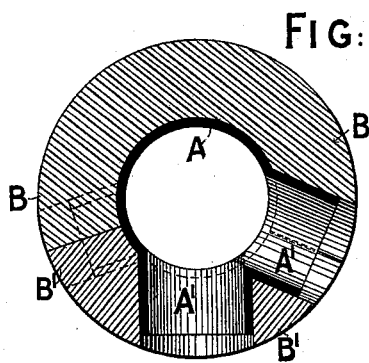
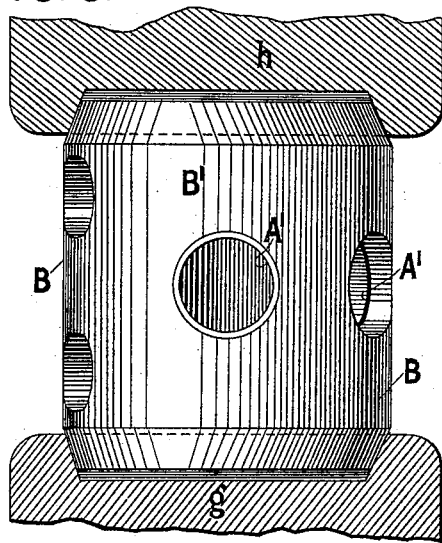


FIG. 2.

FIG. 3.



Witnesses

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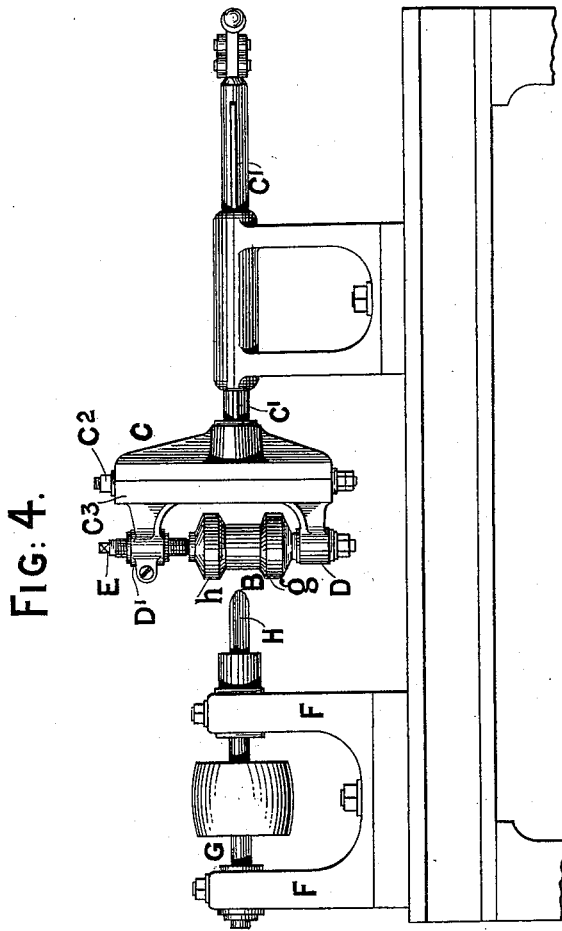
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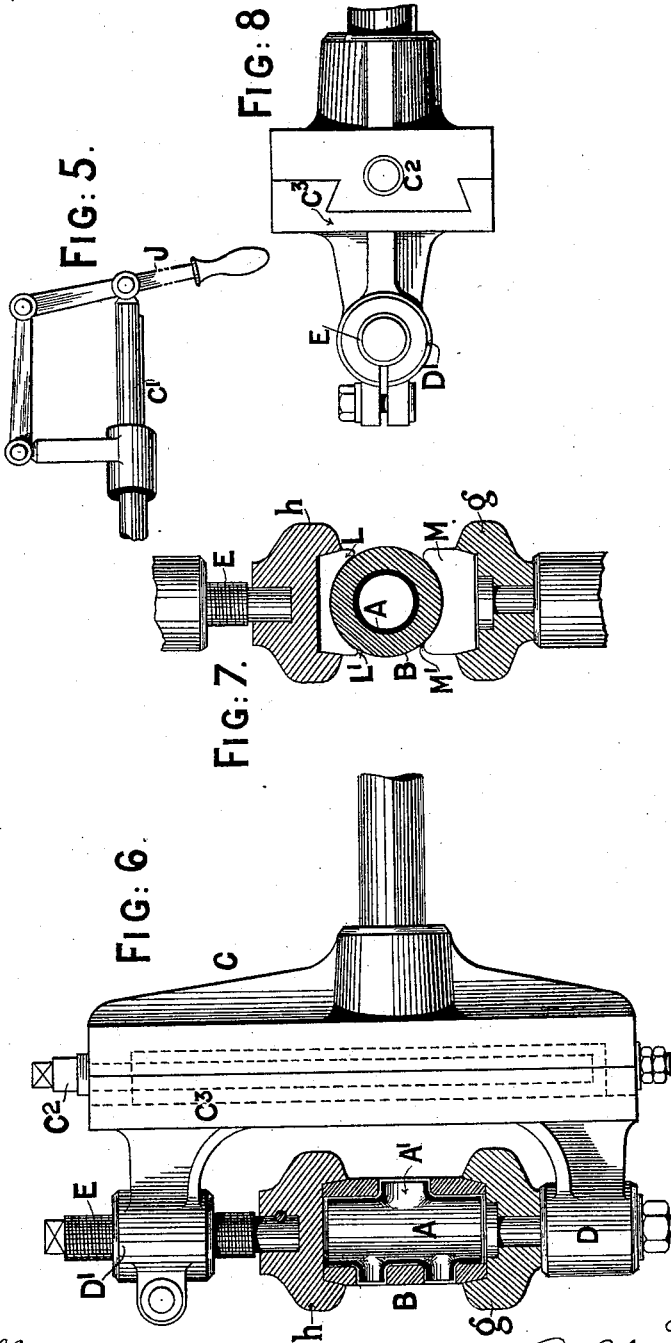
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UNITED STATES PATENT OFFICE.

RUDOLF CHILLINGWORTH, OF NUREMBURG, GERMANY, ASSIGNOR TO THE STANDARD WELDLESS TUBE AND CYCLE COMPONENTS, LIMITED, OF LONDON, ENGLAND.

MEANS FOR FINISHING TUBULAR SOCKETS.

SPECIFICATION forming part of Letters Patent No. 595,938, dated December 21, 1897.

Application filed April 21, 1897. Serial No. 633,125. (No model.) Patented in England December 15, 1896, No. 28,694.

To all whom it may concern:

Be it known that I, RUDOLF CHILLINGWORTH, a subject of the Emperor of Germany, residing at Nuremburg, Germany, have invented certain new or Improved Means for Finishing Tubular Sockets, (for which I have obtained a patent in Great Britain, No. 28,694, bearing date December 15, 1896,) of which the following is a specification.

This invention refers to new or improved machinery or apparatus for finishing, perfecting, or truing up tubes, tubular unions, sockets, or the like, hereinafter called "calibrating"—that is to say, for truing up or perfecting the form of same after manufacture.

This machinery or apparatus is of considerable importance for calibrating tubular parts used in the construction of velocipedes—such, for example, as the tubular bottom brackets, which brackets are formed with projecting tubular sockets to connect the frame-tubes, while the main cylindrical part is to carry the crank-axle bearings. In these tubular brackets it is very important that the said sockets or unions should be placed accurately, as required, relatively to each other and to the axis of the main tube and that the main tube should be truly cylindrical internally. By the apparatus or machinery as hereinafter described this operation of calibrating can be effected in a simple, accurate, and rapid manner by mechanical means.

Figure 1 is a perspective view showing a tubular bracket with sockets, being an example of one of many constructions suitable for being operated upon according to this invention. Fig. 2 is a horizontal section of such a bracket in a case or mold hereinafter described, and Fig. 3 is a sectional elevation showing the case or mold and closing and holding means for same. Fig. 4 is a side elevation of so much of calibrating machinery or apparatus aforesaid as will be necessary for the purpose of this specification. Fig. 5 is a plan view showing a lever mechanism for operating a part of the machine shown at Fig. 4. Fig. 6 is a sectional side elevation drawn to a larger scale than the previous figures, showing the mechanism for holding and adjusting the parts to be operated upon. Fig. 7 is a sec-

tional end view showing further gripping or holding mechanism, and Fig. 8 is a plan view of the parts shown at Fig. 6.

According to this invention and when, for example, operating upon such a bracket as before mentioned—say such as shown at Fig. 1—the piece of tube A, having sockets A', is heated to a sufficient degree and is then inclosed within a divided case or mold. This case or mold is divided in such a manner as to enable it to be placed together and to inclose the tubular bracket A and its socket A'. Thus when the sockets are situated as at Fig. 1 the case may be divided, as shown at Fig. 2, into two parts, as B B', or it may be divided into three or more parts, all according to the relative positions, forms, or numbers of the sockets, apertures being formed to permit access to the interior of the hollow article. The interior form of the case B B' is exactly that which the exterior surfaces of brackets and sockets should assume or possess when finished. Exteriorly the case B B', Fig. 3, is generally cylindrical or may be that of a right polygonal prism, the ends being tapered in a proper degree, so that it may be inserted (when the bracket A has been inclosed) between two clamping-heads h and g, parts of which are shown in section at Fig. 3, and these heads are then brought together, so that the parts of the case B are closed and the contained heated bracket and sockets are caused to assume a correct and perfect external form. Any deviation of the sockets A' from their proper position is therefore corrected at once, and it is then only necessary to make both the tube and the sockets exactly cylindrical internally. These operations are effected while the tube is situated in the aforesaid hollow case by means of apparatus shown at Figs. 4 to 8. This apparatus may be conveniently mounted on a frame similar to that of a lathe or the like and comprises a chuck or holder C, which is fixed on the front end of a longitudinal movable shaft C'. The chuck or holder C carries in connection with an adjusting screwed spindle C² a sliding carriage C³, which can be moved transversely to the axis of the shaft C'. The carriage C³ is provided at each end with a bearing-collar

DD', (best seen at Fig. 6,) from which are carried the clamps *g* and *h*, that serve to hold the case B. The lower one *g* of these clamps is fixed to its collar or carrying-arm D, while
 5 the upper clamp *h* is carried by an adjustable spindle E, screw-threaded into and through the collar D', and the clamp *h* can therefore be moved up and down by means of said spindle E, which is for this purpose provided with,
 10 say, a square upper end onto which may be fitted a lever-handle. Thus the bracket having been inserted within the parts of the case B, the latter is then placed between the clamps *g* and *h* and the latter are closed together by operating the screw E, and the
 15 bracket and its sockets thereby brought to perfect external form while the case remains held firmly between the clamps *g* and *h*. When the case with its contained bracket-tube is thus in position, the sliding carriage C³ is moved by means of the spindle C² until the socket, such as A', to be calibrated has assumed a position coincident with the axis of the shaft C'. F is a fixed head-stock carrying in bearings a driven shaft G, which carries a reamer or boring-tool H, the diameter of which is equal to the internal diameter of the socket which is required to be
 20 trued. The tube having been thus clamped and set in position in the apparatus in the manner described, the shaft C', together with the chuck or holder C, is moved by means of a handle J, Fig. 5, in the direction toward the fixed head-stock F, whereby the reamer
 25 H is caused to enter a socket, such as A', Fig. 6, to ream it out to an exact measurement, and thus finish it truly internally. After moving back the shaft C' (if there are more sockets A' situated in one and the same vertical plane to be treated) the carriage C is moved to a certain extent, so as to bring the next socket into the central axis of the reamer, whereupon by moving the shaft C' the said
 30 socket is also trued up in the manner above described. After all the sockets have been trued up or calibrated the screwed spindle E is screwed upward and the case is removed from the clamping apparatus and the next
 35 piece of tube is placed in it. Now for the purpose of straightening the tube A itself, which tube usually loses its exact cylindrical

shape in consequence of the drawing process, the case B must be clamped in the manner shown in Fig. 7—that is to say, its central axis must be made to coincide with the axis
 55 of the shaft C'. For this purpose packing-pieces L and M are employed, which are placed with their conical ends into the clamps and serve by means of their hollow cylindrical surfaces L' M' to hold firmly and partly in-
 60 close the case B when the clamp *h* is pressed down.

The calibrating operation is effected in the same manner as above described for the sockets by moving the case in the direction of its
 65 longitudinal axis toward the reamer.

I claim as my invention—

1. In an apparatus for calibrating or finishing tubes, the combination with a rotating reamer or tool, a divided case adapted to receive the tubular bracket and sockets or similar article and having tapering ends, clamping-heads for receiving and holding the divided case and means for supporting the clamping-heads and presenting the tube or
 70 tubular socket to the action of the tool, substantially as set forth.

2. A divided case having lateral openings and adapted to receive a tubular bracket and sockets, such case having tapering ends, in combination with the clamping-heads adapted to receive and support the case, a carriage and means for adjusting the same and a longitudinally-movable shaft for supporting the carriage and a tool for truing the tubular
 80 socket, substantially as set forth.

3. The combination with the reaming-tool and means for supporting and rotating the same, of a divided case having tapering ends and adapted to receive the tube with branches
 90 or sockets, the clamping-heads adapted to receive the tapering ends of the case, a sliding carriage with bearing-collars and a screw for acting upon the clamping-heads and means for adjusting the parts and bringing the tool
 95 into action within the tubular socket, substantially as set forth.

RUDOLF CHILLINGWORTH.

Witnesses:

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