No. 847,710. PATENTED MAR. 19, 1907.

H. H. VAUGHAN.

PROCESS OF MANUFACTURING CHANNEL PINS.

APPLICATION FILED JUNE 21, 1902.

Fig. 4.

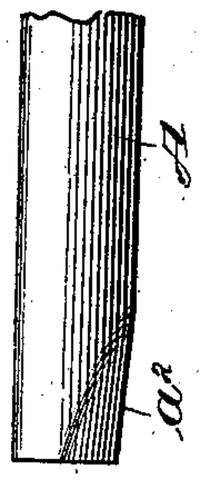

Fig. 9.

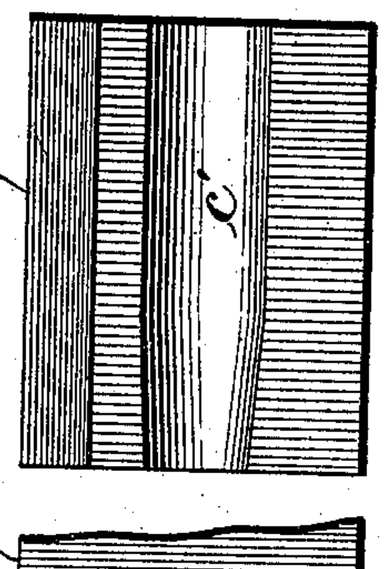

Fig. 12.

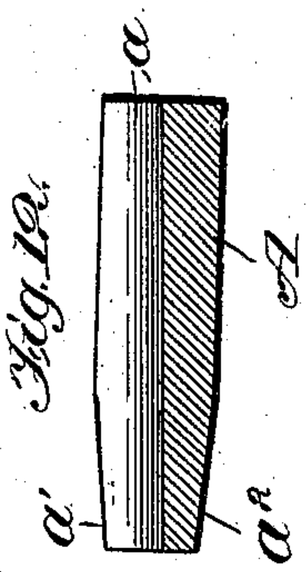

Fig. 3

Fig. 8.

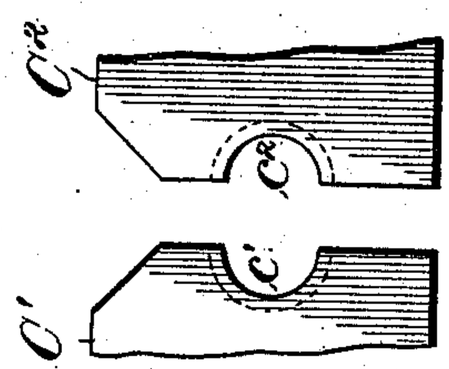

Fig. 2.

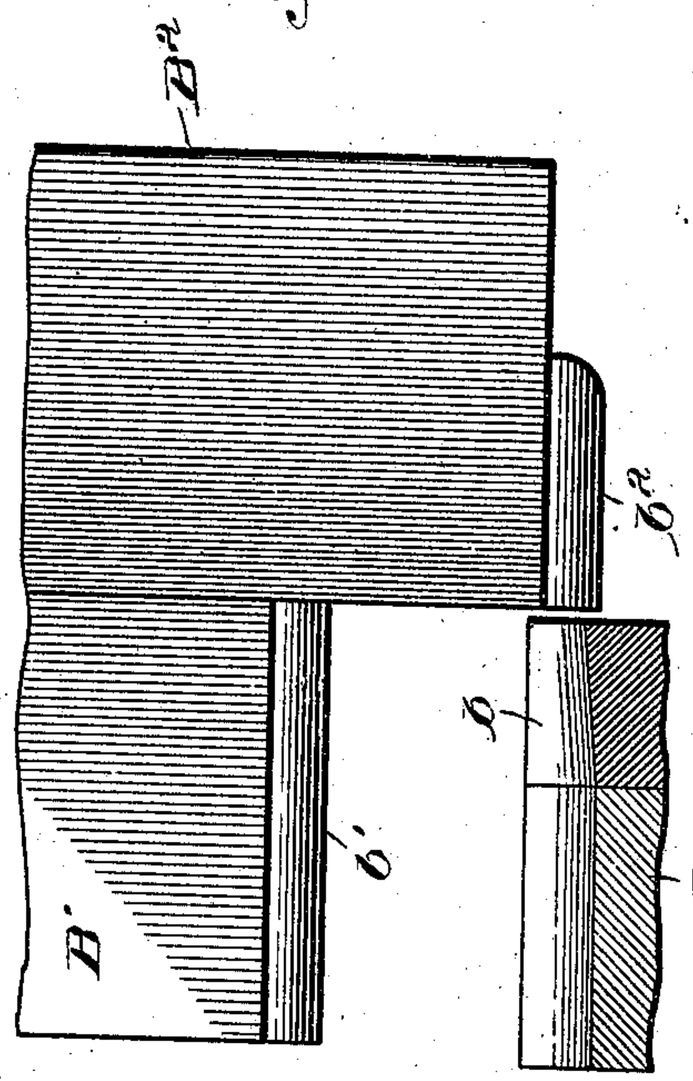

Fig. 7.

Fig. 5.

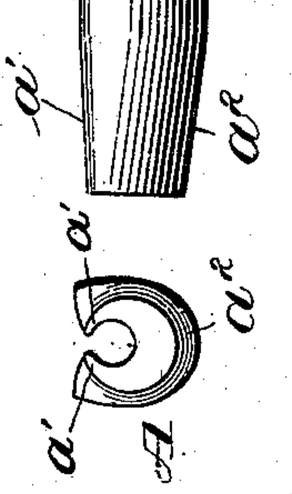

Fig. 11.

Fig. 6

Fig. 10.

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UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURING CHANNEL-PINS.

No. 847,710. Specification of Letters Patent. Patented March 19, 1907.

Application filed June 21, 1902. Serial No. 112,682.

To all whom it may concern:

Be it known that I, HENRY H. VAUGHAN, a citizen of the United States, residing at Cleveland, county of Cuyahoga, State of Ohio, have invented a certain new and useful Improvement in Processes of Manufacturing Channel-Pins; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to channel-pins for uniting electrical conductors, and more particularly to a process for manufacturing such pins.

In connecting small electrical conductors to relatively large conductors it is customary to retain the ends of the small conductor in holes formed in the large conductor by means of wedge-shaped pins. In the art of railroad signaling, for instance, the adjoining ends of rails are electrically connected by wire bonds between the ends of which and the rails are interposed channel-pins. It is customary to provide holes through the webs or bases of the rails in which the ends of the wire bonds are secured. Usually tapered channel-pins are employed, which partially surround the ends of the bonds and which when driven in the holes in the rails securely unite the bonds to the rails and form electrical connections of the requisite capacity. It is essential that the pins should be tapered, so as to be driven readily into the holes in the rails and at the same time be of such cross-section that when driven into the rails they will be folded closely around and tightly engage the ends of the bonds.

The object of my invention is to provide in the art of manufacturing channel-pins an efficient and economical process for imparting to the pins the desired cross-section and contour.

My invention, generally described, consists in beveling vertically the lower end of the pin, tapering horizontally both sides and vertically downwardly the top of the pin, shearing the pin from the bar, and cutting the channel, so as to taper the thickness of the walls of the pin.

My invention will be more fully described hereinafter with reference to the accompanying drawings, illustrating the results of the several steps in the process and so much of the apparatus employed in carrying out the process as is necessary to a complete disclosure of my invention.

Figure 1 is a cross-sectional view of a U-shaped rod which is operated upon by my process to produce channel-pins; Fig. 2, a fragmentary view showing dies for beveling the under surface of the end of the U-shaped rod; Fig. 3, an elevational view of the end of the U-shaped rod after being acted upon by the dies shown in Fig. 2; Fig. 4, a side elevational view of the end of the rod illustrated in Fig. 3; Figs. 5, 6, and 7 end and side elevational and plan views, respectively, of a section of the U-shaped rod after having been acted upon by the dies shown in Figs. 8 and 9 and sheared from the remainder of the rod; Fig. 8, an elevational view of a pair of cooperating dies; Fig. 9, a side elevational view of one of the dies shown in Fig. 8; and Figs. 10, 11, and 12 end elevational, plan, and longitudinal sectional views, respectively, of the finished pin.

Similar reference characters are used in the several figures of the drawing to designate similar parts.

The first step in carrying out my process is the location of the U-shaped rod in the groove formed in the upper surface of the stationary die B. The die B is provided with an inclined portion *b*, as indicated in Fig. 2. The die B′ is then forced downwardly by any suitable means, which are not shown, as the same forms no part of the invention covered by this application. The die B′ is provided with a tenon *b*′, which enters the channel *a* in the rod A. The compression to which the end of the rod is subjected between the incline *b* on the die B and the tenon *b*′ on the die B′ bevels upwardly the lower surface of the end of the rod, as indicated at a^2 in Figs. 3 and 4.

The second step in carrying out my process consists in projecting the end portion of the rod A beyond the die B a distance equal to the desired length for a pin and subjecting the same to compression between a pair of dies C′ and C^2. (Shown in Fig. 8.) The dies C′ and C^2 are provided with recesses *c*′ and c^2 in their adjacent faces, the contour of such recesses corresponding to the desired exterior surface of the pin. The recesses *c*′

and c^2 are preferably tapered, as indicated in Figs. 8 and 9, in order to impart to the pin a wedge shape. The compression to which the end of the rod is subjected between the dies C′ and C² forces inwardly the upper portions of the side walls a' a' of the end of the rod, as shown in Figs. 5 and 7. The side walls a' a' are not only forced toward each other by the dies C′ and C², but are also depressed downwardly slightly, as indicated in Figs. 5 and 6, thereby tapering the end of the rod.

The next step in carrying out my process is the shearing off of a portion of the end of the rod which has been operated upon in the manner above described the length desired for the pin. A portion of the rod after being treated as set forth may be conveniently sheared off by securing to the die B′ a knife B², provided with a projection b^2 on its under surface, which coöperates with the adjacent edge of the die B to shear off a section of the rod to form a pin.

The last step in my process consists in cutting the channel a in the pin to a depth sufficient to taper the thickness of the lower wall of the pin, as shown in Figs. 10 and 12. The cutting of the channel also removes the inturned portions of the side walls a' a' and imparts a taper to the thickness of the side walls of the pin, as shown in Fig. 11. The channels may be cut to the desired depth in the pins by any suitable form of milling-cutter of well-known construction.

In carrying out my process the third step—namely, that of shearing off the section of the rod the length of the pin—may be conveniently performed coincidently with the performance of the first step of the process in making the next pin following the one which is sheared off. This coincident performance of the two steps may be effected by the location of the shearing projection b^2 in a plane below the tenon b' on the die B′, as indicated in Fig. 2.

From the foregoing description it will be observed that I have invented an improved process for quickly, practically, and economically manufacturing channel-pins from a U-shaped rod of the desired cross-section.

It is obvious that my process may with slight variation in the apparatus used be adapted for the manufacture of tapered pins or wedges of other cross-section and shape than channel-pins.

While I have described more or less precisely the details of the several steps of my process, I do not wish to be understood as limiting myself thereto, as I contemplate whatever changes circumstances may suggest or render expedient which may come within the spirit of my invention.

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

1. The process of manufacturing channel-pins which consists in bending toward each other the edges of a suitable metal blank and simultaneously tapering the blank by compression, then sizing the channel between the edges by cutting the excess metal from its walls.

2. The process of manufacturing channel-pins from a rod of U-shaped cross-section which consists in tapering the exterior surface of the end of the rod by compression and tapering the thickness of the walls of the pin by cutting the channel to a predetermined depth and width.

3. The process of manufacturing channel-pins from a rod of U-shaped cross-section which consists in tapering the exterior surface of the end of the rod by compression, shearing off a portion of the end of the rod the predetermined length of the pin, and tapering the thickness of the walls of the pin by cutting the channel to a predetermined depth and width.

4. The process of manufacturing channel-pins from a rod of U-shaped cross-section which consists in tapering the exterior surface of the end of the rod by compression, subsequently shearing off a portion of the end of the rod the predetermined length of the pin and coincidently beveling the adjacent end of the rod, and finally tapering the thickness of the walls of the pin by cutting the channel therein to a predetermined depth and width.

5. The process of manufacturing channel-pins from a rod of U-shaped cross-section which consists in beveling the under surface of the end of the rod, tapering the end of the rod by lateral compression, shearing off a portion of the end of the rod the predetermined length of the pin, and tapering the thickness of the walls of the pin by cutting the channel to a predetermined depth and width.

In testimony whereof I sign this specification in the presence of two witnesses.

HENRY H. VAUGHAN.

Witnesses:
PAUL C. CADY,
F. A. DUNN.