

T. MERCER.
CRANK MANUFACTURE.
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1,022,434.

Patented Apr. 9, 1912.

FIG. 1.

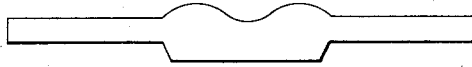


FIG. 2.

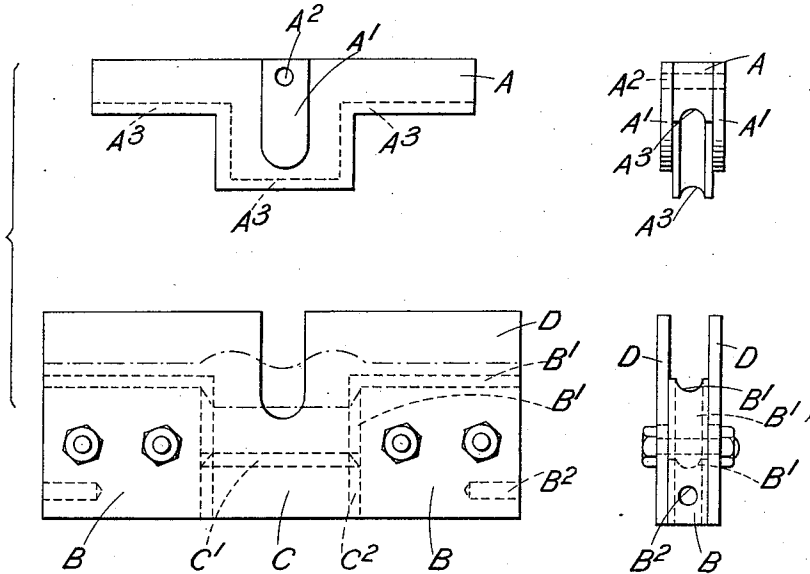
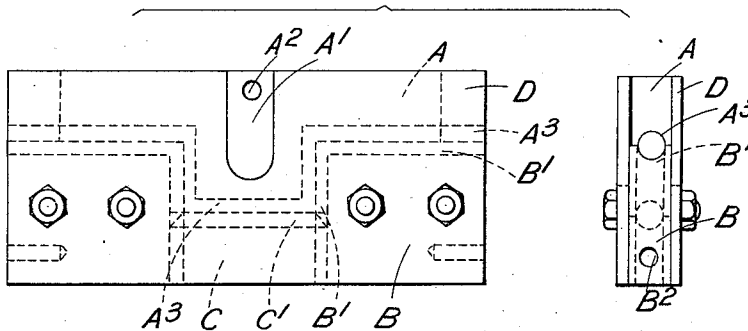


FIG. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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CRANK MANUFACTURE.

1,022,434.

Specification of Letters Patent.

Patented Apr. 9, 1912.

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To all whom it may concern:

Be it known that I, THOMAS MERCER, subject of the King of England, residing at Frank street, off North Road, Preston, in the county of Lancaster, England, have invented certain new and useful Improvements in Crank Manufacture, of which the following is a specification.

This invention relates to the manufacture of crank shafts, and has for its object to provide a crank which is stronger than those previously made.

According to this invention a blank of approximately the same thickness as the completed crank shaft and having a widened portion where the crank is to be made, is forged or otherwise formed, the breadth of the widened portion being substantially equal to the throw the crank is eventually to have. The ends of the bar on either side of the widened portion are forged or drawn out to the required length and a hollow is preferably formed in the upper edge of the widened portion. The blank thus formed is then reheated and subjected to pressure between suitable dies which are so shaped that the complete crank is formed in one operation when they are forced together.

The dies or blocks are in shape similar to those already used for forging bent cranks from a rod of uniform diameter, being of such form that when brought together they inclose a space corresponding in shape to a completed crank shaft, the cooperating surfaces of the dies being provided with semi-cylindrical grooves whereby the crank pin and crank shaft are formed. In some cases the semi-cylindrical groove may be extended along those surfaces of the dies which form the web of the crank, or the dies may be so shaped that a web of rectangular or other cross-section is formed if desired.

A crank shaft made in accordance with the above method has its angle formed square, differing in that respect from the rounded corners of the usual bent crank. A greater thickness of metal is thus obtained where strength is most required.

In the accompanying drawings, Figure 1 shows in side elevation a blank from which a completed crank shaft is to be made. Fig. 2 shows in side and end elevation, by way of example, a pair of dies in accordance

with this invention the upper die being shown in its raised position, and Fig. 3 is a view similar to Fig. 2 showing the dies in their closed position.

To impart the final form to the crank shaft the apparatus employed comprises an upper block A having two projecting guides or shoulders A' formed on its face, and a hole or recess A² for the introduction of a bar or tool enabling the block to be readily handled. The under or operative surface of the block A is hollowed to coincide with the shape of the inner surface of the finished crank shaft, a semi-cylindrical groove A³ being provided along the whole length of its operative surface. If desired, however, a groove of other cross-section may be provided along the vertical portion of the block A should it be desired to form a crank having a web of rectangular or other cross-section.

The lower die comprises two blocks B bolted together between plates D, a distance piece or block C being interposed between the blocks B but only held in place by friction, so that this central block can be displaced to facilitate the removal of the finished crank shaft after stamping. The blocks B are provided with grooves B' similar to those in the block A, and the central block is also grooved as at C' on its upper surface, the ends C² being shaped to fit that portion of the groove B' which is formed on the inner vertical edges of the blocks B. The blocks B are conveniently provided with recesses, such as B², for the insertion of tools or bars to facilitate handling. Downward slots are formed in the plates D into which the shoulders A' on the block A enter and thus guide the upper block in its descent.

Figs. 2 and 3 show in dotted lines the blank and finished crank respectively.

What I claim as my invention and desire to secure by Letters Patent is:—

The herein described method of making crank shafts consisting in forming a blank with end sections of a thickness approximately the same as the completed shaft and an intermediate section of greater thickness from which the crank is formed, said intermediate section having a recess in its upper edge between the portions thereof adapted

to constitute the angles connecting the shaft
sections and crank in the finished article,
heating said blank and then forging it by
pressure between dies so shaped that a com-
5 plete crank shaft having its shaft and crank
sections connected by square angles is
formed at one operation.

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

THOMAS MERCER.

Witnesses:

A. T. HUGHTEN,

WM. BUTTERWORTH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
