G. F. COTE.

CRANK SHAFT.

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1,363,957. Patented Dec. 28, 1920.

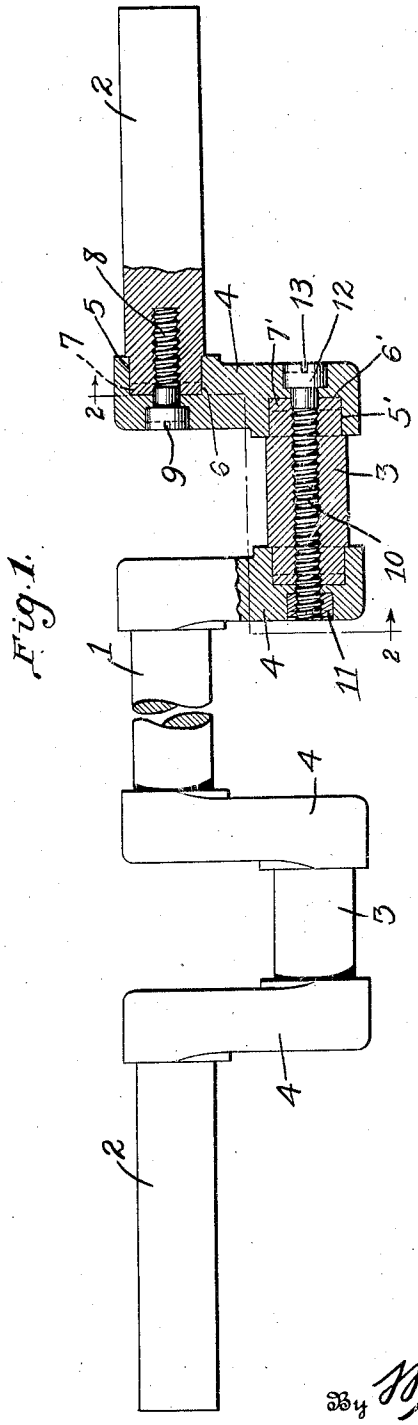


Fig. 1.

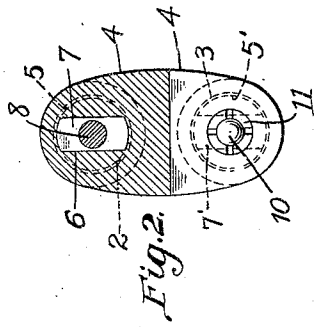


Fig. 2.

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UNITED STATES PATENT OFFICE.

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CRANK-SHAFT.

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To all whom it may concern:

Be it known that I, GEORGE F. COTE, citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Crank-Shafts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in crank shafts, the main object of the present invention being the provision of a crank shaft wherein the crank pins are formed separable from the main stock of the crank shaft so that should one of the crank pins become worn or broken, it can be readily replaced with a new one, thus eliminating the necessity of discarding the entire crank shaft.

Another object of the present invention is the provision of a crank shaft whereby the expense of the production is materially reduced and wherein the several parts of the shaft can be manufactured separately and the different parts retained at hand for the purpose of substituting new parts for broken ones, should the necessity arise, and wherein the several parts of the crank shaft can be quickly and readily positioned together or taken apart.

Another object of the present invention is the provision of a crank shaft formed of separable parts and suitable means for connecting these parts of the crank shaft, whereby to provide a structure to withstand force which may be applied thereto and wherein these parts can be readily assembled or disassembled, as the case may require.

With the above and other objects in view, the invention consists in the novel features of construction, the combination and arrangement of parts hereinafter more fully set forth, pointed out in the claims and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a crank shaft, constructed in accordance with my invention, parts thereof being broken away and illustrated in cross-section, and

Fig. 2 is a transverse sectional view, taken on the line 2—2 of Fig. 1.

In the construction of my improved crank shaft, I include the main stock portion 1, the ends 2, the crank pins 3, and the arms 4 which connect the crank pins to the stock 1 and ends 2.

It will be noted that secured to each end of the stock 1 is one of the arms 4 and secured to the inner end of the end pieces 2 is a second arm 4 and between the outer ends of these arms 4, the crank pins 3 are secured. The manner of attaching the arms 4 to the stock 1 and the ends 2 is carried out by providing the ends of the arms with recesses 5 of substantially the same shape as the ends to be received therein and further providing these recesses 5 with transverse recesses 6 adapted to receive the transverse lugs 7 formed upon the ends of the stock 1 and the inner ends of the end pieces 2 which will absolutely prevent any turning movement on the part of the end pieces 2 or the stock 1 with respect to the arms 4. It will be noted that the ends of the stock 1 and the end pieces 2 are slightly reduced before being inserted within the recesses 5, thus providing shoulders which bear against the outer faces of the ends of the arms 4 and provide a substantially tight-fitting joint. In order to securely connect the ends of the arms with the stock 1 and the end pieces 2, a screw bolt 8 is inserted through the end of the arm and threaded into the ends of the stock 1 and the end pieces 2 as clearly illustrated in Fig. 1. It will be noted that the head of the screw bolt 8 is embedded within the ends of the arms 4 and further provided with transverse slots 9 whereby a screw driver or other instrument can be used for engaging and disengaging the screw bolts 8 with the respective ends of the stock 1 and the end pieces 2.

The crank pins 3 are provided with reduced end portions and adapted to be inserted within the recesses 5′ formed upon the inner faces of the arms 4, said recesses 5′ being provided with the transverse grooves 6′ arranged at their inner ends to receive the transverse lugs 7′ formed upon the ends of the crank pins 3, thus preventing any turning movement of the crank pins 3 with respect to the arms 4. It will be noted that the crank pins 3 are securely retained in position so that their ends are tightly engaged with the ends of the arms 4 by means of the screw bolts 10, which extend longitudinally through the crank pins 3 and through the ends of the arms 4 and are retained in position by means of the nuts 11 preferably embedded within the ends of the

arms 4 as are also the heads, thus preventing any of the parts of the bolt from projecting beyond the outer surfaces of the arms. These bolt heads 12 are provided with transverse grooves 13, adapted to be engaged by a screw driver or other similar implement for securely tightening the bolts in their proper positions.

From the above description, taken in connection with the accompanying drawings, it will be readily apparent that I have provided a crank shaft comprising several parts which can be quickly assembled together and securely held in their proper relative positions to provide a crank shaft equal in strength to a shaft formed of a single piece of metal and wherein the several parts thereof, should they become worn or broken, can be replaced by new ones at a comparatively small expense, thus eliminating the necessity of discarding an entire crank shaft, should one of the crank pins become worn through or broken.

What I claim is:

1. A crank shaft including a stock portion and end portions, arms having recesses in one of their faces for receiving the ends of the stock and the end portions, said arms being provided with transverse grooves within the recesses, tongues formed on the ends of the stock and end portions for insertion within said grooves and means for separably securing the arms to the ends of the stock and end portions and crank pins removably arranged within the outer ends of the arms.

2. A device of the class described, including a stock portion and end portions, arms secured to the end of the stock and the inner ends of the end portions, recesses formed in the inner faces of the arms at the outer ends thereof and further provided with grooves within said recesses, crank pins having their ends arranged within the recesses, tongues on the ends of the crank pins for engagement within the grooves to prevent turning movement of the pin and removable bolts extending through the arms and through the pins, as and for the purpose set forth.

In testimony whereof I affix my signature.

GEORGE FRANCIS COTE