W. SCHELLENBACH.

CRANK TURNER.

APPLICATION FILED OCT. 28, 1912.

1,067,138.

Patented July 8, 1913.

2 SHEETS—SHEET 1.

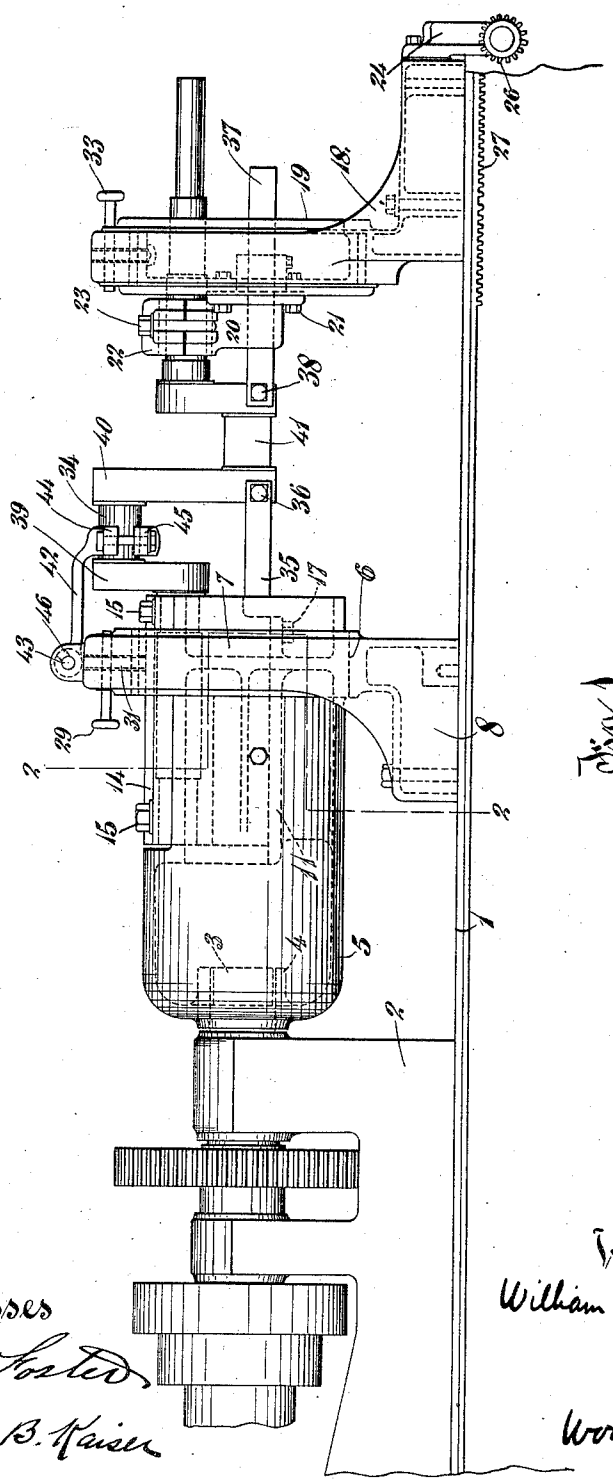


Fig. 1

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2

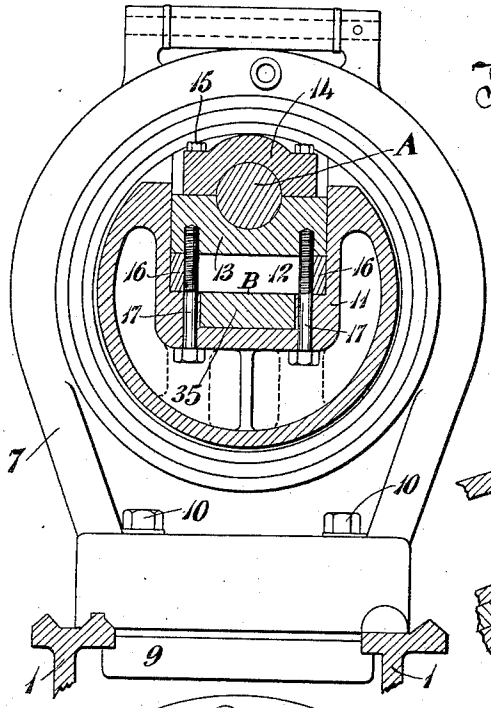


Fig. 3

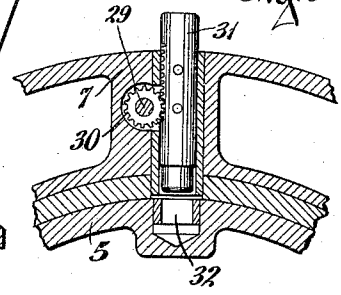
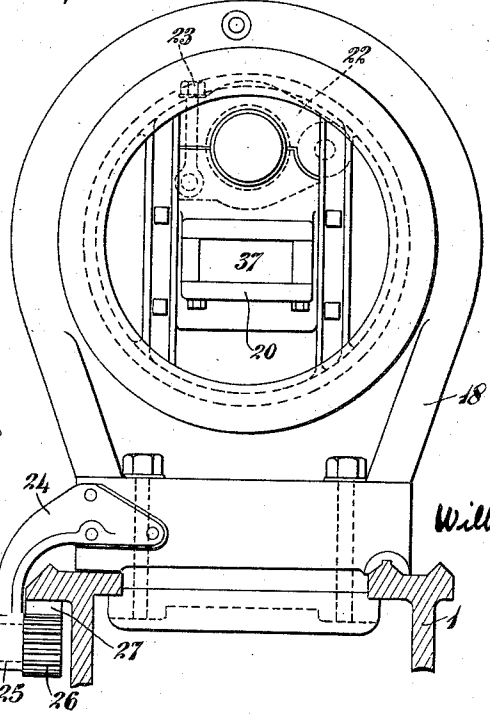


Fig. 4



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CRANK-TURNER.

1,067,138. Specification of Letters Patent. Patented July 8, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM SCHELLENBACH, a citizen of the United States, residing at Hartwell, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Crank-Turners, of which the following is a specification.

This invention deals with means instrumental in facilitating the turning of cranks, and it is more especially concerned with a device in the nature of an attachment applicable to an ordinary engine lathe, whereby the work of the operator in turning cranks will be expedited.

One object within the contemplation of this invention is to create a crank turning attachment of a simple and relatively inexpensive character, that will enable an operator rapidly and with accuracy to produce duplicate cranks conforming to a given standard.

Another and more specific object is to devise an arrangement especially applicable for turning cranks on a crank shaft, having a plurality of crank pins of equal throw and disposed 180° apart, and to so devise the attachment that the operation of positioning the respective crank pins, preparatory to the turning of the same will be greatly simplified and expedited.

Other objects will be in part apparent from the annexed drawings and in part pointed out in the following description in connection therewith.

In order that this invention may be so fully disclosed to those skilled in this art that they may be enabled to embody the same in the various forms and modifications to which it is readily subject, drawings exemplifying a preferred form have been appended as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all of the figures, of which:—

Figure 1 is a longitudinal elevation showing the attachment applied to an engine lathe and indicating the use of the attachment in positioning the second crank pin preparatory to turning the same. Fig. 2 is a section taken along line 2—2 Fig. 1, looking toward the left thereof and showing partly in elevation the head stock element of this attachment. Fig. 3 is a detail in section showing the finger operating device for locking the revolving crank holder in a predetermined angular position during the clamping of the crank shaft, preparatory to turning one of the pins thereof. Fig. 4 is an end elevation looking to the left of the tail stock member of this attachment.

Continuing now by way of a more detailed description 1 indicates an engine lathe having the usual guide rails and 2 denotes the casting of a head-stock of conventional design mounted thereon. This head-stock carries a suitable spindle 3, on which is adapted to be secured the hub 4 of a rotatable head 5 proposed by this invention and which is in the nature of a special chuck adapted to receive and hold one end of the crank shaft. This member 5 is preferably constructed in the form of a hollow drum or cylinder, and near its forward end it is provided with an annular bearing surface 6 that is suitably journaled within a corresponding portion of a stationary head-stock 7. This head-stock is provided with a base 8 suitably grooved to fit on the guide rails of the lathe bed; to which it is fixed by means of the clamp block 9 by tightening the screws 10.

While this attachment may be made to accommodate only one size of crank shaft having a definite throw, it is preferably constructed to be universal so as to be adapted for accommodating a crank shaft of any desired diameter, and having the crank pins set at any degree of eccentricity or throw. To that end, the revolving head 5 interiorly provides a longitudinally extending casting 11, providing a channel 12. Between the walls of this channel snugly fits a block 13, to which is bolted a cap 14. These parts are in turn bored out, so as to receive one end of the crank shaft and hold the same tightly against turning when the screws 15 are tightened. In case it is desired to turn a crank shaft having a different diameter from that shown, it is merely necessary to replace blocks 13 and 14 by others suitably bored out and utilize split bushings in connection therewith, as the case may be. To enable the center of the crank shaft (indicated by A) to be distanced from the center of revolution of the head 5 (indicated by B) to conform to the throw or eccentricity desired in the crank pin, the block 13 is adjustable up and down in the channel 12, and by using liners 16 of appropriate height, the bolts 17 may be tightened up so as to secure the block 13 rigidly in position at any desired position 14.

The tail-stock of this attachment is con-

structed in an analogous manner, it comprising a stationary standard 18 having rotatably mounted therein an annular support 19. This support likewise carries a bracket 20 secured to the same by means of suitable bolts 21, which bracket is bored out to receive the other end of the crank shaft and carries a cap 22 hinged thereto and adapted to be brought down to clamp the crank shaft by means of the bolt 23. Inasmuch as in replacing the various crank shafts it is necessary to move the standard 18, a bracket 24 is preferably secured to the same and carries a shaft 25, on the end of which a gear 26 is mounted, that meshes with a suitable rack 27 on the lathe bed. By means of a suitable handle 28, this gear may be rotated to travel the tail-stock standard 18 toward and away from the work.

In using this attachment, the crank shaft is first mounted with its respective ends in the bearing blocks 13 and 14, and 20 and 22, respectively. It is now necessary to adjust the angular position of the crank shaft preparatory to turning the first pin. Before doing this, the revolving head 5 and revolving support 19 will have been brought to the initial or setting position, shown by the drawings. This may readily be done by means of the device illustrated by Fig. 3, with which each of these revolving parts is provided. Thus, a finger pin 29 is journaled in the annular portion of the standard 7 and carries a small pinion 30 that meshes with a corresponding rack on a plunger pin 31. A socket 32 is arranged in the periphery of the revolving head 5 at a point indicating the setting position. A corresponding construction is utilized in connection with the tail stock fixture. The adjusting finger pin is indicated by 33. By this device the revolving members of both the head-stock and tail-stock fixtures may have their crank shaft apertured brought into exact alinement. Before the screws are tightened to clamp the crank shaft in its bearings, the crank shaft is positioned preparatory to turning the first pin, indicated by 34. This pin is first swung to a position of 180° in advance of that shown on Fig. 1, and it is held in place by clamping means that will now be described.

Referring to Fig. 2, 35 indicates a slide bar, having a sliding bearing in the casting 11 and adapted to be moved parallel to the center line of the lathe. At its ends this bar 35 is provided with means whereby it may be clamped to the off set portions joining the crank pin or a crank pin and the crank shaft. Thus, such bar 35 may be bifurcated and provided with suitable set screws 36. A similar bar 37, having set screws 38 is arranged in the tail stock fixture. After the crank pin 34 has been brought to a position opposite that shown in Fig. 1, the set screw 36 is caused to clamp the off set portion of the crank shaft at a point indicated by 39, and the set screw 38 of the opposite bar 37 is brought to bear on the portion indicated by 40. The parts are then tightened up and the finger pins 29 and 33 are actuated to withdraw the locking pins and the operation of turning the crank pin 34 is proceeded with. At the end of this operation, the locking pins are again caused to fix the position of the revolving members, the brace bars 35 and 37 are released, the caps clamping the crank shaft are loosened and the crank shaft is turned until the pin is brought into the position shown by Fig. 1. It is now necessary to accurately locate the position of pin 34, so that the pin 41 may be turned in the predetermined relation of pin 34. To that end, a stop lever 42 is hinged at 43 to the head stock standard and terminates in an end 44, having a recess counterparting the periphery of the pin 34. By means of suitable bolts a clamp bar 45 may be drawn up tightly to positively fix the relation between the position determining lever 42 and the crank pin 34. It will be understood that before this is done, the revolving head 5 must be locked in its predetermined position by the finger pin 29. To prevent any oversight in this respect, the hub of the lever 42 is preferably provided with a hole 46 that receives the pin 31 when it is in its restricted position. When the lever 42 is thrown in the position shown, the hole 46 is brought out of registry with the pin 31 so that the latter must be in its locking position to enable the lever 42 to be clamped on the pin 34. The position of the pin 41 is now insured and it is fixed by drawing out the brace bars 35 and 37 and clamping their ends by means of the set screws 36 and 38, as shown by Fig. 1. It is now necessary to remove the clamp bar 45 and lift up the lever 42 and operate the finger pins 29 and 33 to withdraw the locking pins. The turning of the second pin 41 may now be proceeded with.

It will thus be perceived that this invention is well adapted to achieve the objects and ends aforesaid and that it is of a relatively simple character structurally and is well adapted to be manufactured at a reasonable cost.

I therefore claim and desire to secure by Letters Patent:—

1. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein, and having an eccentrically located crank shaft socket, a stop for temporarily locking said head in a definite relation to said standard, and means carried by said standard for determining the proper position of the crank shaft in said socket.

2. A crank turning fixture of the nature

disclosed combining a stationary standard, a head rotatably mounted therein, and having an eccentrically located clamp socket for a crank shaft, means for temporarily locking said head in definite relation to said standard, and means carried by said standard adapted to be temporarily brought into engagement with a finished crank pin whereby another unfinished crank pin will be positioned concentrically with the axis of said head and in proper predetermined angular relationship with said finished crank pin.

3. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein, and having an eccentrically located clamp socket for a crank shaft, means for temporarily locking said head in definite relation to said standard, means carried by said standard adapted to be temporarily brought into engagement with a finished crank pin whereby another unfinished crank pin will be positioned concentrically with the axis of said head and in proper predetermined angular relationship with said finished crank pin, and a device adapted to be extended from said revolving head into attachment with a crank arm to brace said unfinished crank pin during the turning thereof.

4. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein, and having an eccentrically located crank shaft socket, a stop for temporarily locking said head in a definite relation to said standard, means carried by said standard for determining the proper position of the crank shaft in said socket, and a device extending from said revolving head adapted to brace said crank shaft at the end of a crank pin during the turning thereof.

5. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein, and having an eccentrically located crank shaft socket, a stop for temporarily locking said head in a definite relation to said standard, and means operative on a finished crank pin for determining the exact angular relation of said crank shaft in said socket to position another pin concentrically with the axis of said head.

6. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein, and having an eccentrically located crank shaft socket, and means carried by said standard for locking said head in definite relation therewith and for determining by contact with a finished crank pin the proper position of the crank shaft in said head preparatory to finishing another crank pin.

7. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein and having an eccentrically located crank shaft socket, a stop pin intervening temporarily between said standard and said head, and a device pivoted to said standard and adapted to be temporarily swung into engagement with a finished crank pin accurately to predetermine the position of said crank shaft relative to said head.

8. A crank turning fixture of the nature disclosed combining a stationary standard, a head rotatably mounted therein and having an eccentrically located crank shaft socket, a stop pin intervening temporarily between said standard and said head, a device pivoted to said standard and adapted to be temporarily swung into engagement with a finished crank pin accurately to predetermine the position of said crank shaft relative to said head, and means between said pin and said device whereby the latter is prevented from occupying an operative position unless said pin is occupying a locking position.

9. A crank turning fixture of the nature disclosed combining a rotatable head interiorly provided with a longitudinal channel having its side walls parallel with a common radius, a block having a crank-shaft socket interfitting in said channel, and adapted to be positioned at predetermined distances from the axis of said head, an insertion piece intervening between the aforesaid block and the bottom of said channel adapted to determine the eccentricity of said block, and clamping means for holding said block against said piece.

10. A crank turning fixture of the nature disclosed combining a rotary shell-like head, a clamp having a crank shaft socket arranged in said head, and a bar slidably mounted in said head and adapted to be withdrawn in an axial direction, said bar terminating in means enabling it to be secured to portions of a crank shaft to brace and stiffen the same during the finishing operation.

11. A crank turning fixture of the nature disclosed combining an elongated rotary head interiorly providing an elongated surface extending parallel with the axis of said head, a clamp having a socket for a crank-shaft and arranged in said head parallel with said surface, a removable piece interfitting between said surface and said clamp adapted to determine the eccentricity of said socket in said head, and means for pressing said clamp onto said piece to maintain its position.

12. A crank shaft turning fixture of the nature disclosed combining a rotary shell-like head interiorly having a longitudinal channel, a clamp having a crank-shaft socket and arranged in said channel, means for binding said clamp in its position, and a bar slidably mounted in said head and

adapted to be withdrawn in an axial direction, said bar terminating in means enabling it to be secured to portions of a crank-shaft to brace and stiffen the same during a tooling operation.

13. A mechanism of the nature disclosed for tooling crank-pins of a crank-shaft combining a revoluble head, an eccentrically adjustable clamp mounted therein and providing a clamp-socket adapted to receive the initially turned shaft of a crank-shaft to clamp it against movement relative to said head to enable a crank-pin to be held in axial registry with said head while being tooled, and stop mechanism operative to determine by direct contact with the tooled periphery of said crank-pin the exact angle through which said shaft is to be next rotated in said clamp-socket to position an unfinished crank-pin in such relation with the axis of said head that it will be tooled in correct angular relation with said previously tooled crank-pin.

14. A mechanism of the nature disclosed for tooling crank-pins of a crank-shaft combining a revoluble head, a clamp mounted thereon adapted to grip a shaft portion of a crank shaft to position a crank-pin rigidly for tooling about the axis of said head, and stop mechanism operative in definite relation with said head adapted by direct contact with the tooled periphery of said crank-pin to limit the next shift of the crank shaft and so locate an unfinished crank-pin as to insure its being tooled into the exact predetermined relation with said previously tooled crank-pin.

15. A mechanism of the nature disclosed for tooling crank-pins of a crank-shaft combining a revoluble head providing an eccentrically positioned clamp-socket adapted to receive and clamp against movement relative to said head the initially turned shaft of a crank-shaft to hold a crank-pin for tooling about the axis of said head, and stop mechanism operative in definite relation to said head adapted precisely to determine by direct contact with the tooled periphery of said crank-pin the position which said shaft is next to assume in said clamp-socket to locate an unfinished crank-pin in such relation with said head that will be tooled in correct angular relation with said previously tooled crank-pin.

16. A mechanism of the nature disclosed for tooling crank-pins of a crank-shaft combining a revoluble head, a member adjustable eccentrically thereon and having a clamp-socket adapted to grip a shaft portion of a crank-shaft and adapted to enable different portions of said crank-shaft to be positioned rigidly in coaxial relation with said head preparatory for a tooling operation, and stop mechanism operative in definite relation with said head adapted by direct contact with a tooled surface of said crank-shaft to limit the next shift thereof whereby the portion next to be finished will be positioned in such axial relation with the head as will insure its being tooled accurately in the predetermined relation with the already tooled portion.

17. A mechanism of the nature disclosed for tooling crank-pins of a crank-shaft combining a revoluble head providing a socket adapted to receive the initially turned shaft of a crank-shaft, means for holding said crank-shaft against movement relative to said head to enable a crank-pin to be tooled while located coaxially with said head, and stop mechanism operative in definite relation to said head adapted exactly to limit by direct contact with the tooled periphery of said crank pin the next adjustment of said shaft in said socket to locate an unfinished crank-pin in an axial relation with said head enabling it to be tooled accurately in the predetermined angular relation with said previously tooled crank-pin.

In testimony whereof, I have hereunto set my hand.

WILLIAM SCHELLENBACH.

Witnesses:
OLIVER B. KAISER,
CLARENCE B. FOSTER.

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