(No Model.) 4 Sheets—Sheet 1.

T. W. BROOMELL.

WRIST PIN TURNING ATTACHMENT FOR LATHES.

No. 462,370. Patented Nov. 3, 1891.

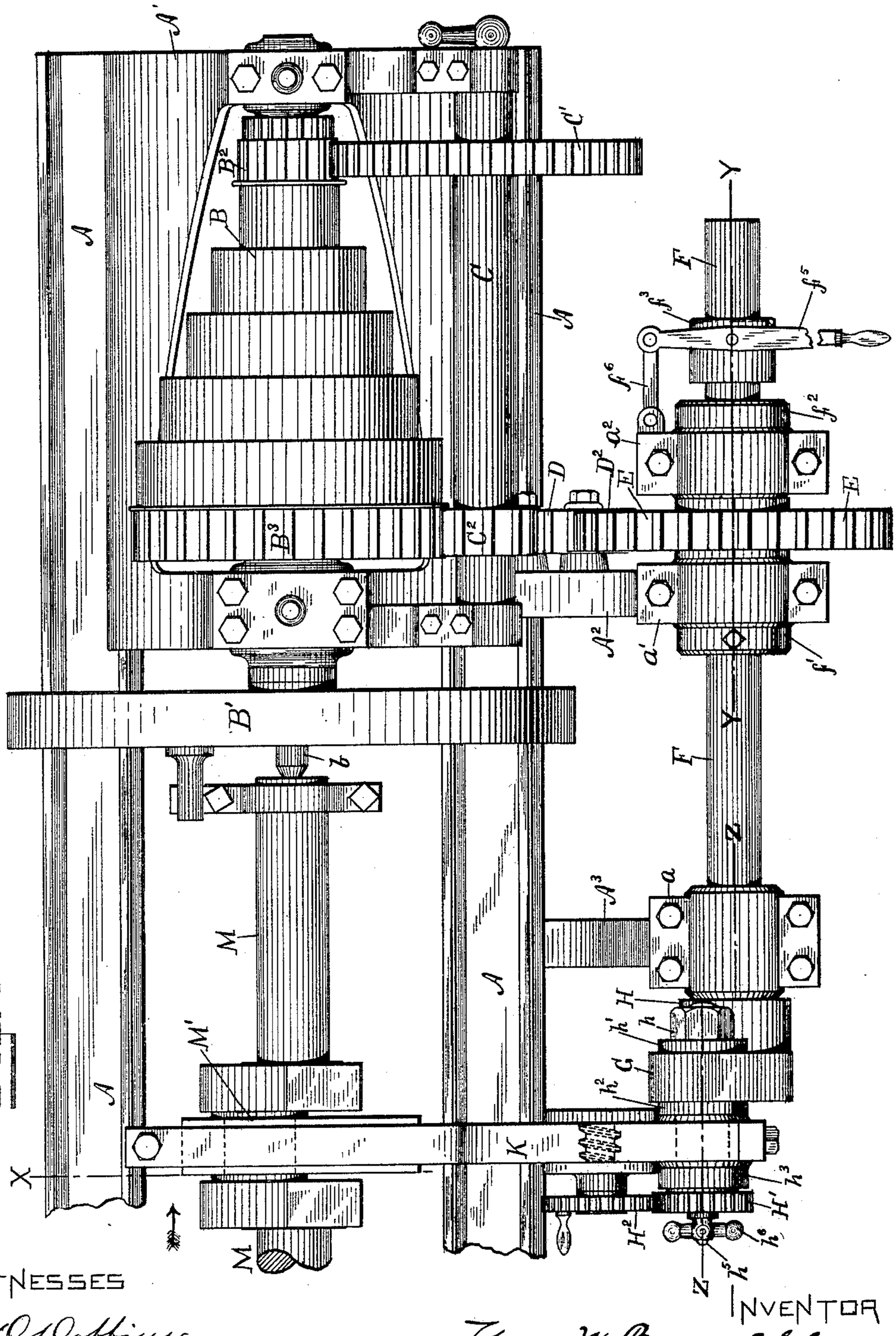

FIG. 1

WITNESSES

S. D. Dobbins.

H. M. Stinger jr

Thomas W. Broomell
by Hallock & Hallock

BY HIS ATTYS.

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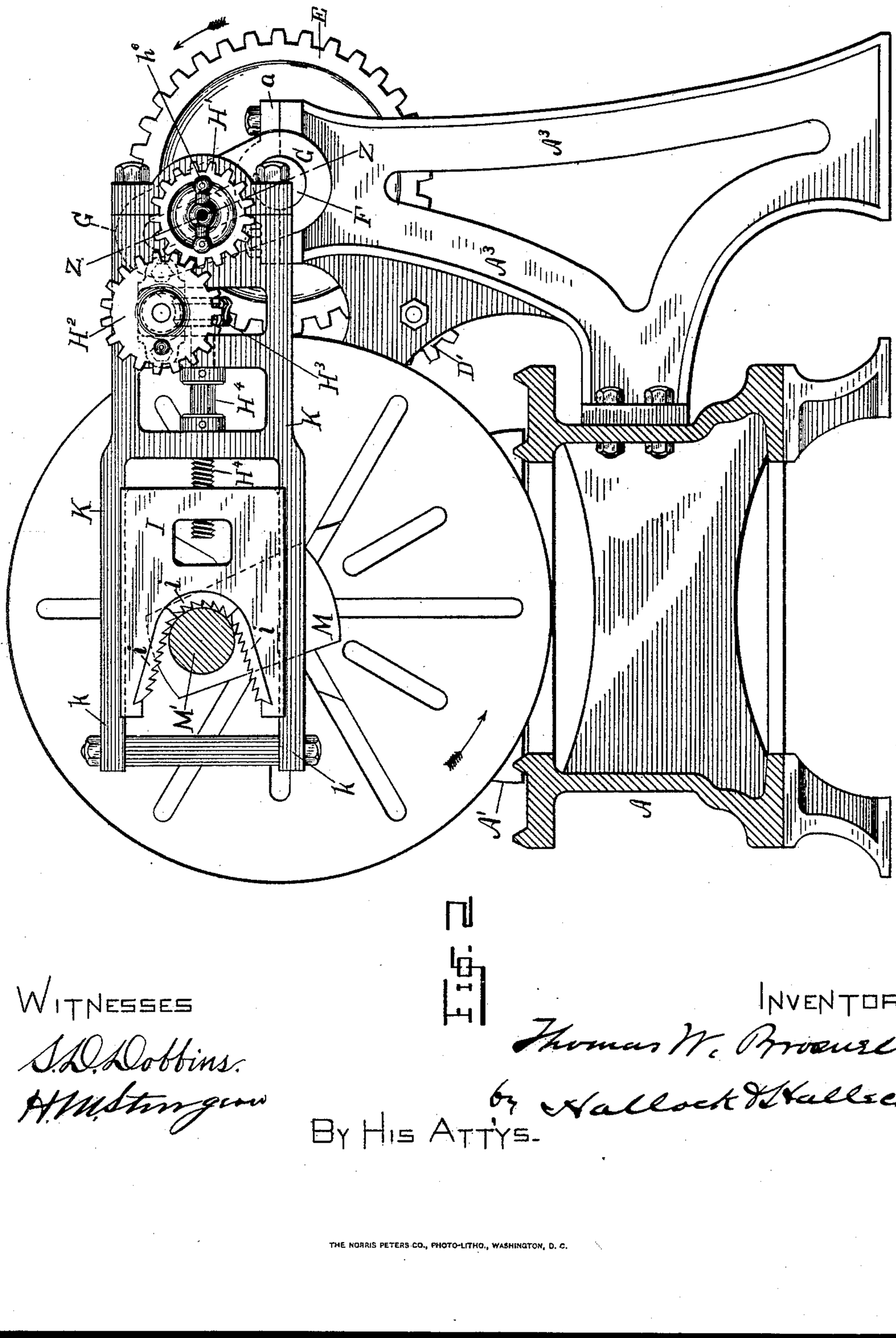

FIG. 1.

WITNESSES

S. D. Dobbins.

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(No Model.) 4 Sheets—Sheet 3.

T. W. BROOMELL.

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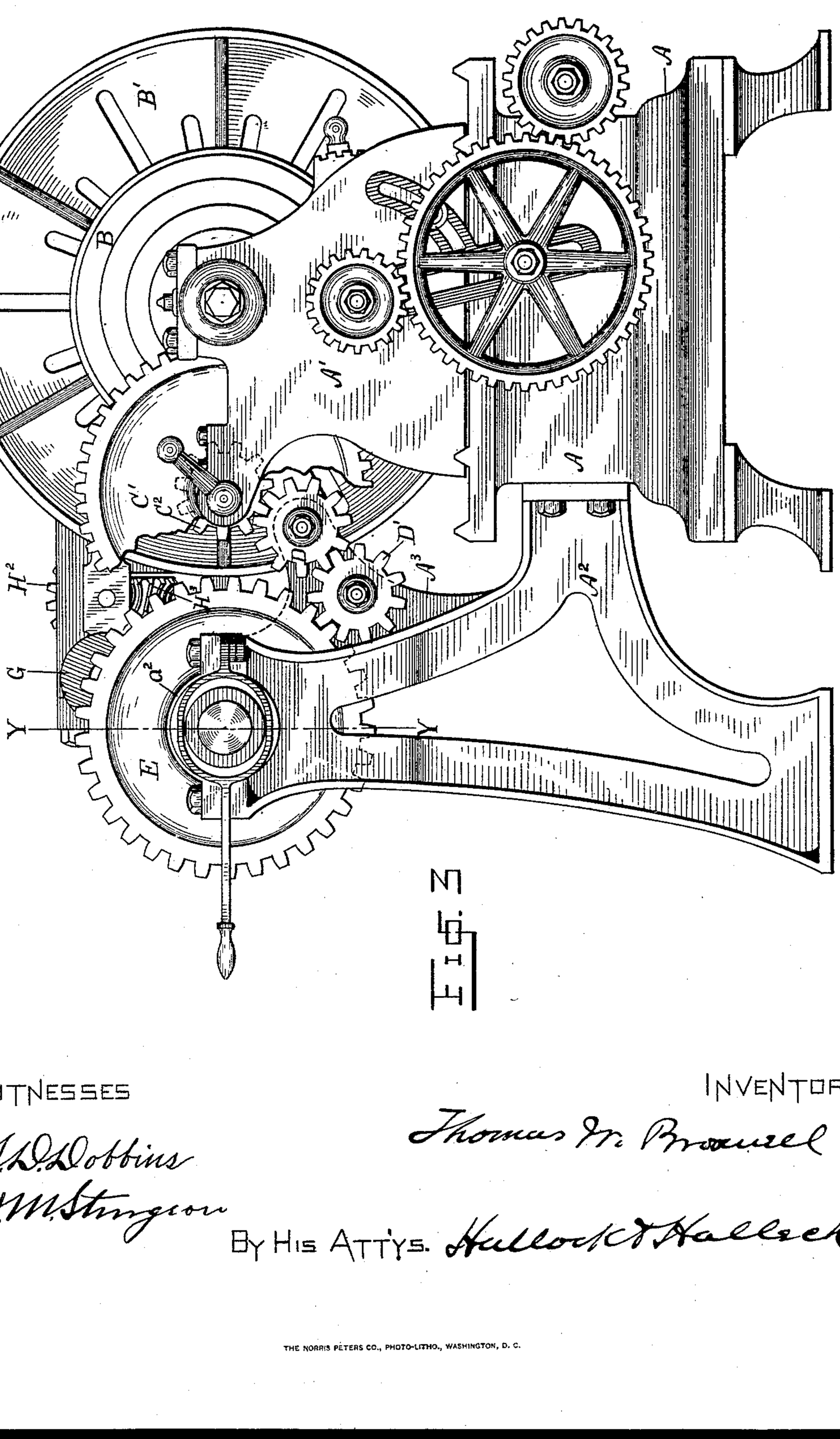

FIG. 1.

WITNESSES

S. D. Dobbins

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(No Model.) 4 Sheets—Sheet 4.

T. W. BROOMELL.

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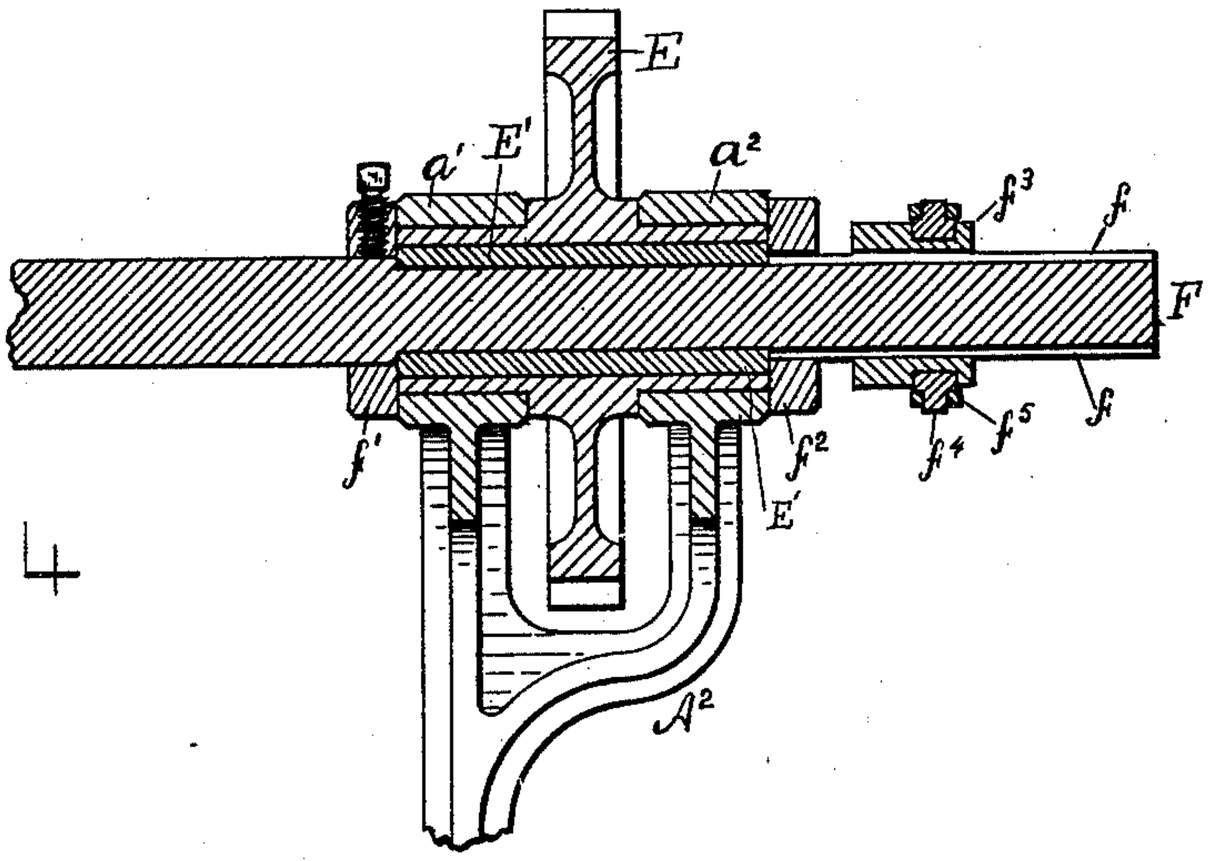

FIG. 4

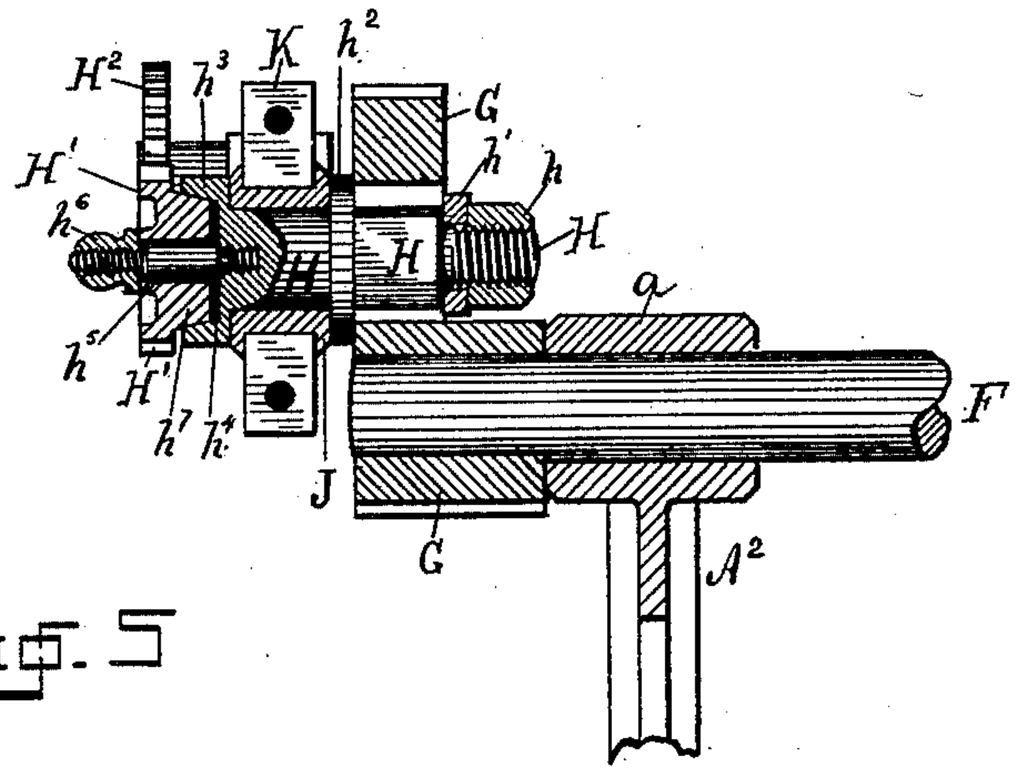

FIG. 5

WITNESSES

S. D. Dobbins.

H. M. Strong

INVENTOR

Thomas W. Broomell

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BY HIS ATT'YS.

UNITED STATES PATENT OFFICE.

THOMAS W. BROOMELL, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE BURTON MACHINE COMPANY, OF SAME PLACE.

WRIST-PIN-TURNING ATTACHMENT FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 462,370, dated November 3, 1891.

Application filed March 28, 1891. Serial No. 386,767. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. BROOMELL, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Wrist-Pin-Turning Attachments for Lathes; 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 iron-turning lathes; and it consists in certain improvements therein whereby the same are adapted to finish crank-shafts, as will hereinafter be fully explained, and pointed out in the claims.

My invention is illustrated in the accompanying drawings, as follows:

Figure 1 is a top or plan view of one end of an ordinary iron-turning lathe with my improvement attached thereto. Fig. 2 is a vertical section and elevation view, the line of section being on the line *x x* in Fig. 1, and the view being in the direction of the arrow. Fig. 3 is an end elevation of the parts shown in Fig. 1, looking from the right of that figure. Fig. 4 is a vertical longitudinal section taken on the line *y y* in Figs. 1 and 3. Fig. 5 is a longitudinal vertical section taken on the line *z z* in Figs. 1 and 2.

A and A′ mark the frame-work of an ordinary iron-turning lathe.

A^2 and A^3 is the frame-work of my attachment, which is bolted to the lathe-bed A.

B B^2 B^3 C C′ C^2 are parts of the ordinary gearing of the lathe.

B′ is the lathe-disk, and *b* the center.

M is an ordinary center-crank engine-shaft mounted in the lathe.

F is a shaft mounted in the journal-boxes *a a′* a^2 in the attachment-frame A^2 and A^3.

On the shaft F is a driving-gear E, which is connected by idlers D and D′ with the gear C^2 on the shaft C on the lathe. The size of the gears is such that the shaft F will rotate synchronously with the disk B′.

On the inner end of the shaft F is a slotted crank G, having an adjustable pin H, which can be set with its center at the same distance from the center of the shaft F as the center of the crank-pin M′ of the crank-shaft M is to be from the center of the shaft M. A frame K is carried on the crank-pin H, and in the frame is carried, between the guide-bars *k*, a cutter-head I, with cutters *i*, which embraces the blank crank-pin M′ on the crank-shaft M. A feeding mechanism, to be hereinafter fully described, moves the cutter-head I to its work properly. The shaft M and the shaft F having synchronous movement, and the crank G on the shaft F being of the length that the finished crank on the shaft M is to have and being set parallel with it, the frame K will have a movement like a connecting-rod connecting two cranks, and, the cutters being constantly advanced to their work as the parts move in the manner above stated, the crank-pin M′ will be finished with its center exactly corresponding with the center of the pin H.

The means for feeding the cutters *i* to their work are as follows: A screw-shaft H^4 is journaled in the frame K and connects with a nut in the cutter-head. On this screw-shaft is a worm-wheel H^3, which is in gear with a worm on the shaft of the pinion H^2. The pinion H^2 meshes with a pinion H′, which is attached to the adjustable crank-pin H. As the crank G revolves the pinion H′ will impart rotary movement to the pinion H^2 and its shaft, and this, through the worm-gear H^3, will slowly rotate the screw H^4.

The gear H′ is attached to the pin H by a friction-clutch device, as follows: The head h^3 of the pin H has a female conical recess h^4, into which fits a male cone h^7 on the back of the pinion H′. A stud-pin h^5, attached to the pin H, passes through the center of the pinion H′. A hand clamp-nut h^6 on the end of the stud-pin is used to clamp the conical parts together. In order to draw the cutter-head back from the work and to set it forward rapidly to its work, the clutch device is loosened, and by grasping a handle on the pinion H^2 and rotating that pinion rapidly (the pinion H′ will run loose and not interfere with this movement) the screw-shaft can be turned rapidly and the cutter-head set at any point desired. The crank-pin H has on the outside of the crank G a fixed shoulder h^2 and on the inside a washer *h′* and nut *h*, by which means the pin can be clamped at any point along the slot in the crank. The frame K is journaled on the pin H between the shoulder h^2 and the head h^3.

In order to apply the crank-pin cutting de-

vice to crank-shafts of different lengths, it is necessary that the shaft F have longitudinal adjustment. This is effected by feathering the shaft F within its driving-gear E, as seen more clearly in Fig. 4, in which f is the groove in the shaft F, and E′ E′ are the feather or spline keys in the hub of the gear E. On either side of the gear E and the journal-boxes are clamped collars f' f^2, by which the shaft F can be held at any point of adjustment longitudinally desired.

After the crank-pin M′ has been turned down to the proper size it is necessary to polish it, and this can be done by my device by removing the cutters and putting in a lead-lap or other polishing-pad. In polishing it is desirable that the pad or lead-lap be given a movement lengthwise of the wrist-pin, and therefore it is necessary that the pad be of less width than the length of the pin, so as to permit of longitudinal movement. To give this movement the shaft F must be given a longitudinal movement, and to allow of this one of the clamp-collars f' or f^2 should be loosened a little and set back and then tightened again.

To facilitate the movement of the shaft F longitudinally for the purpose just named, I provide a clamp-collar f^3 thereon, in which is an annular groove, in which is a strap f^4 with trunnions, which are journaled in a yoke-lever f^5, which is pivoted to a link f^6, which is connected with the adjoining journal-box a^2. By moving the lever f^5 back and forth horizontally the shaft F will be reciprocated longitudinally, and this will move the frame K reciprocally and move the polishing-pad carried thereby longitudinally on the pin M′.

What I claim as new is—

1. In a machine for the purpose named, the combination, with the spindle of an iron-turning lathe, of a shaft mounted parallel with said spindle and driven synchronously therewith, a crank on said parallel shaft, the pin of which is coequally eccentric with and mounted in the same vertical plane as the pin to be finished on the blank crank-shaft mounted on the center of said lathe, a cutter-frame carried on the crank-pin of the parallel shaft and the crank-pin of the blank crank-shaft in the manner of a connecting-rod, a cutter in the end of said frame which embraces the pin on the blank crank-shaft in the manner of a journal-box, and feeding mechanism for automatically advancing said cutter-head to its work.

2. In a machine for the purpose named, the combination, with the spindle of an iron-turning lathe, of a shaft mounted parallel with said spindle and driven synchronously therewith, a crank on said parallel shaft the wrist-pin of which is in the same vertical plane as the wrist-pin on the blank crank-shaft mounted on the center of said lathe and is adjustable radially in said crank, so as to be set coequally eccentric with the wrist-pin to be finished, a cutter-frame journaled at one end on said adjustable wrist-pin and having at its other end a cutter-head which embraces the wrist-pin to be finished in the manner set forth, and feeding mechanism operated from a pinion on said adjustable wrist-pin for advancing said cutter-head to its work.

3. In a machine for the purposes mentioned, the combination, with the spindle of an iron-turning lathe, of a shaft mounted parallel with said spindle and driven from the back-gear of said lathe synchronously with said spindle, a crank on said parallel shaft having a radially-adjustable wrist-pin, means, substantially as shown, for adjusting said parallel shaft so that the wrist-pin thereon can be set in the same vertical plane as the wrist-pin to be finished, a cutter-frame journaled at one end to said adjustable wrist-pin and having at the other end a cutter-head which embraces the wrist-pin to be finished, as set forth, and feeding mechanism for automatically advancing said cutter-head to its work.

4. In a machine for the purposes mentioned, the combination, with the spindles on which the blank crank-shaft is mounted, of a shaft mounted parallel with said spindles and geared to rotate synchronously with the live-spindle, a crank on said shaft having therein a radially-adjustable wrist-pin, and means for longitudinally adjusting said shaft so that the wrist-pin thereon may be adjusted in radial and lateral position to correspond with the wrist-pin to be finished on the blank crank-shaft, a cutter-frame connecting said two crank-pins, a cutter-head on said frame carrying cutters which act upon the blank crank-pin, and a feeding mechanism for advancing said cutter-head, which consists of a screw-shaft, a worm-gear for moving said screw-shaft, and gearing for moving said worm-gear as the said parallel shaft is rotated.

5. In a machine for the purposes mentioned, the combination, with the spindles on which the blank crank-shaft is mounted and the shaft F, mounted parallel with said spindles and carrying the cutting device for finishing the wrist-pin of the blank crank-shaft and being also longitudinally movable, of means, substantially as shown, for reciprocating said shaft F while in rotative action.

6. In a machine for the purposes mentioned, the combination, with the cutter-head I, screw-shaft H^4, worm-gear H^3, and pinion H^2, of the pinion H′, having the male part h^7 of a cone-clutch on its back, the female part h^4 of a cone-clutch on the end of the wrist-pin H, and the screw-stud h^5 and nut h^6 for operating said cone-clutch.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS W. BROOMELL.

Witnesses:
JNO. K. HALLOCK,
WM. P. HAYES.