No. 770,381. PATENTED SEPT. 20, 1904.

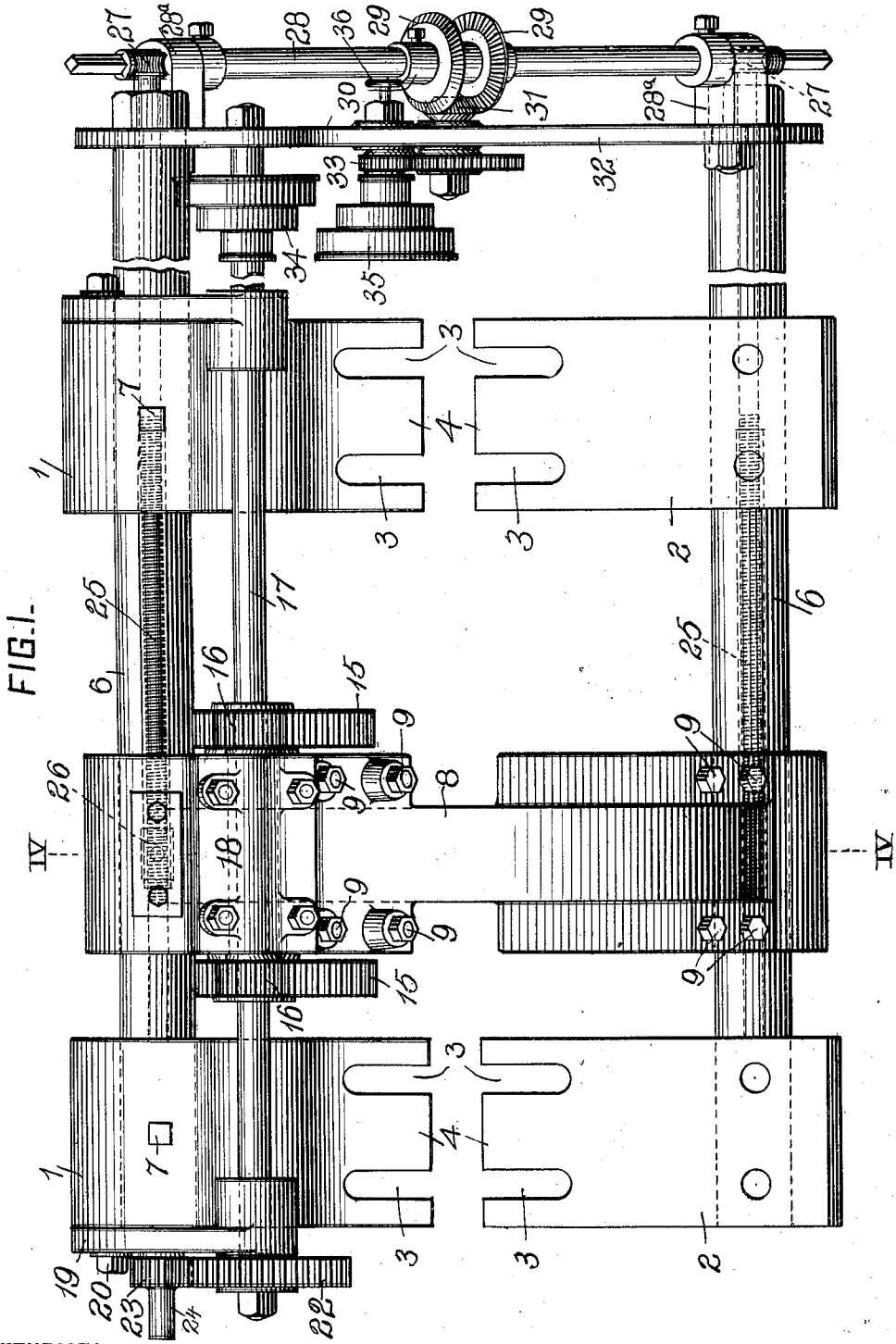
S. McMILLEN.

MECHANISM FOR TURNING WRIST PINS, &c.

APPLICATION FILED SEPT. 9, 1903.

NO MODEL. 7 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:
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Fred Kirchner.

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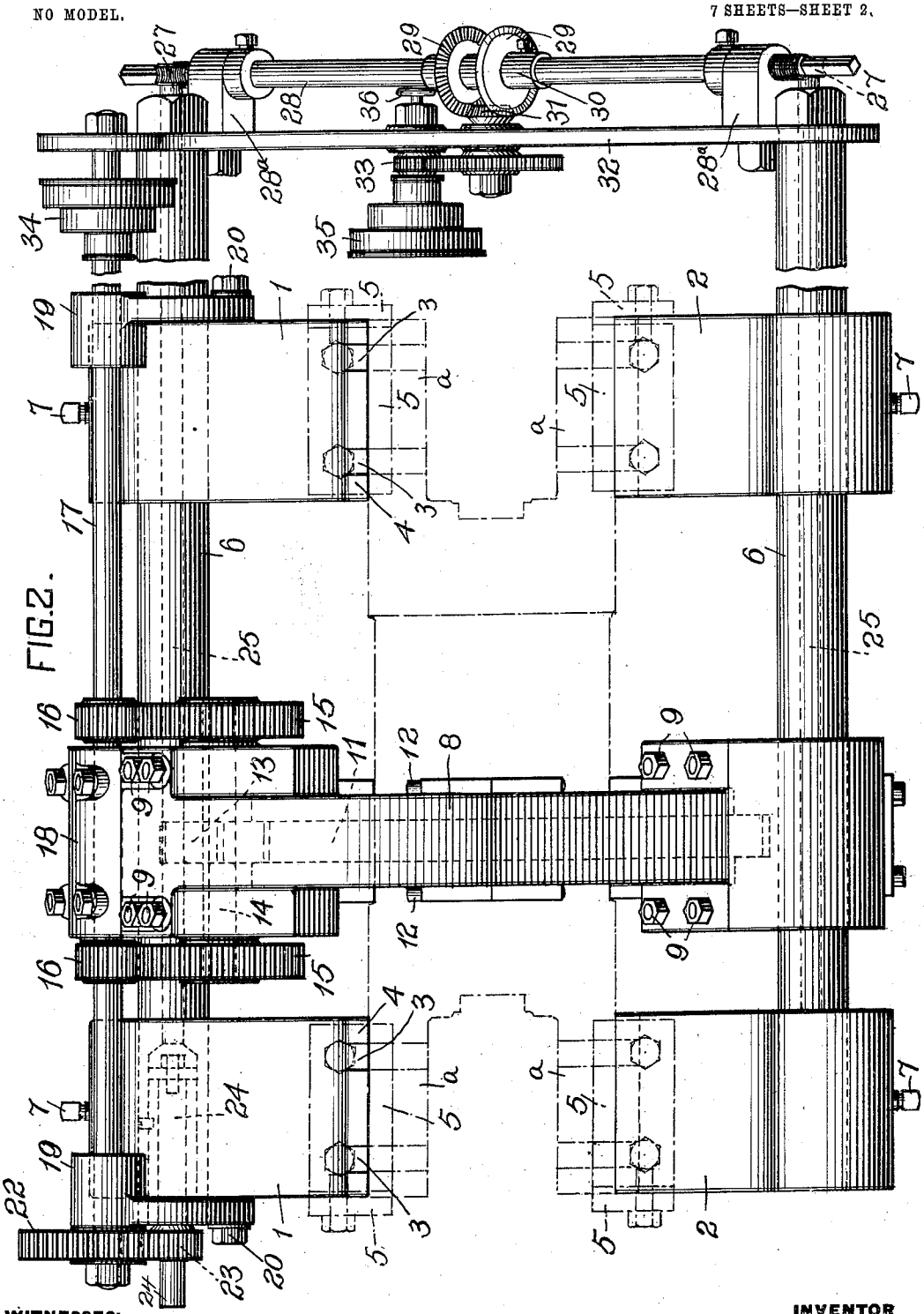
NO MODEL. 7 SHEETS—SHEET 2.

FIG. 2.



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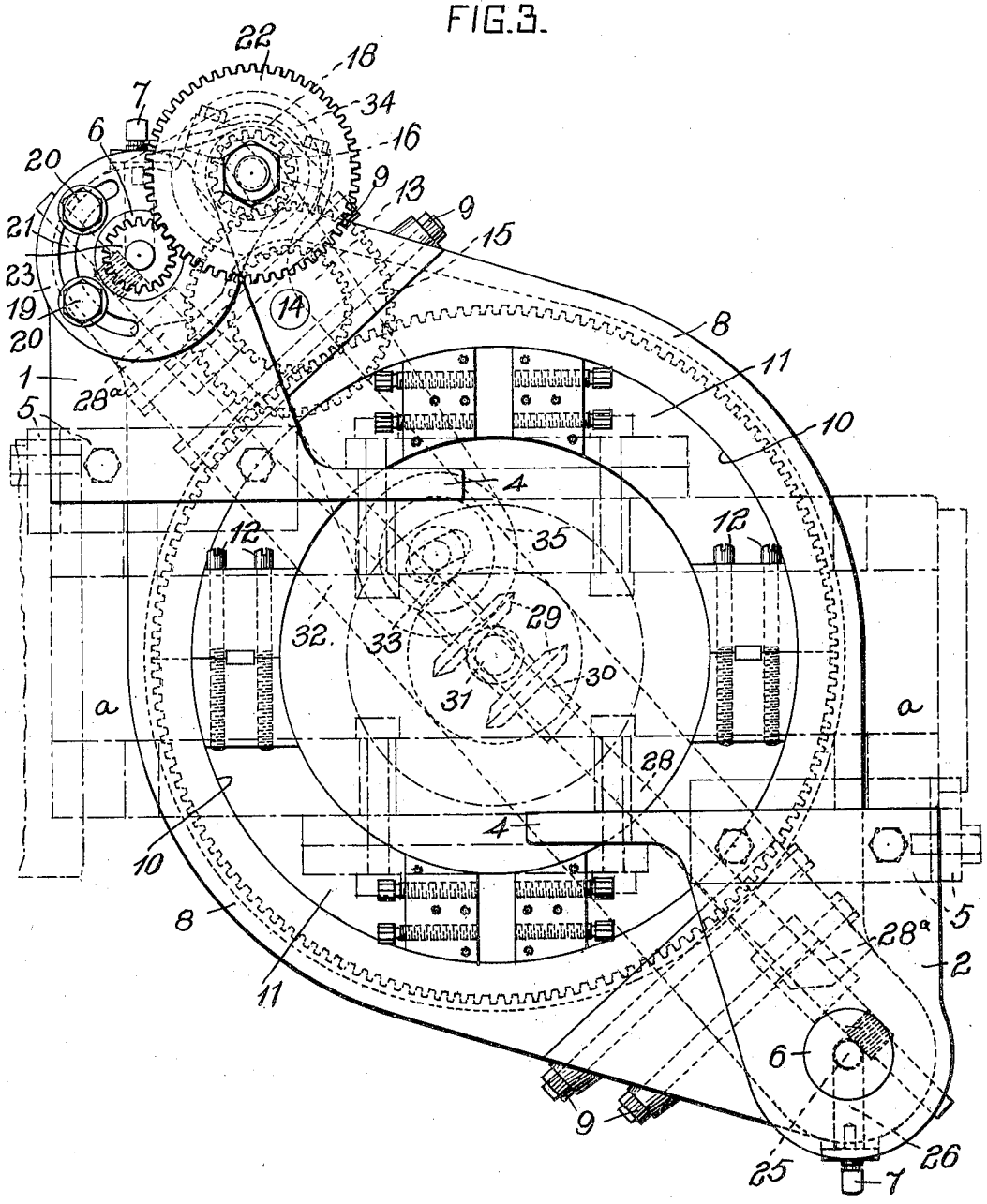
NO MODEL. 7 SHEETS—SHEET 3.

FIG. 3.



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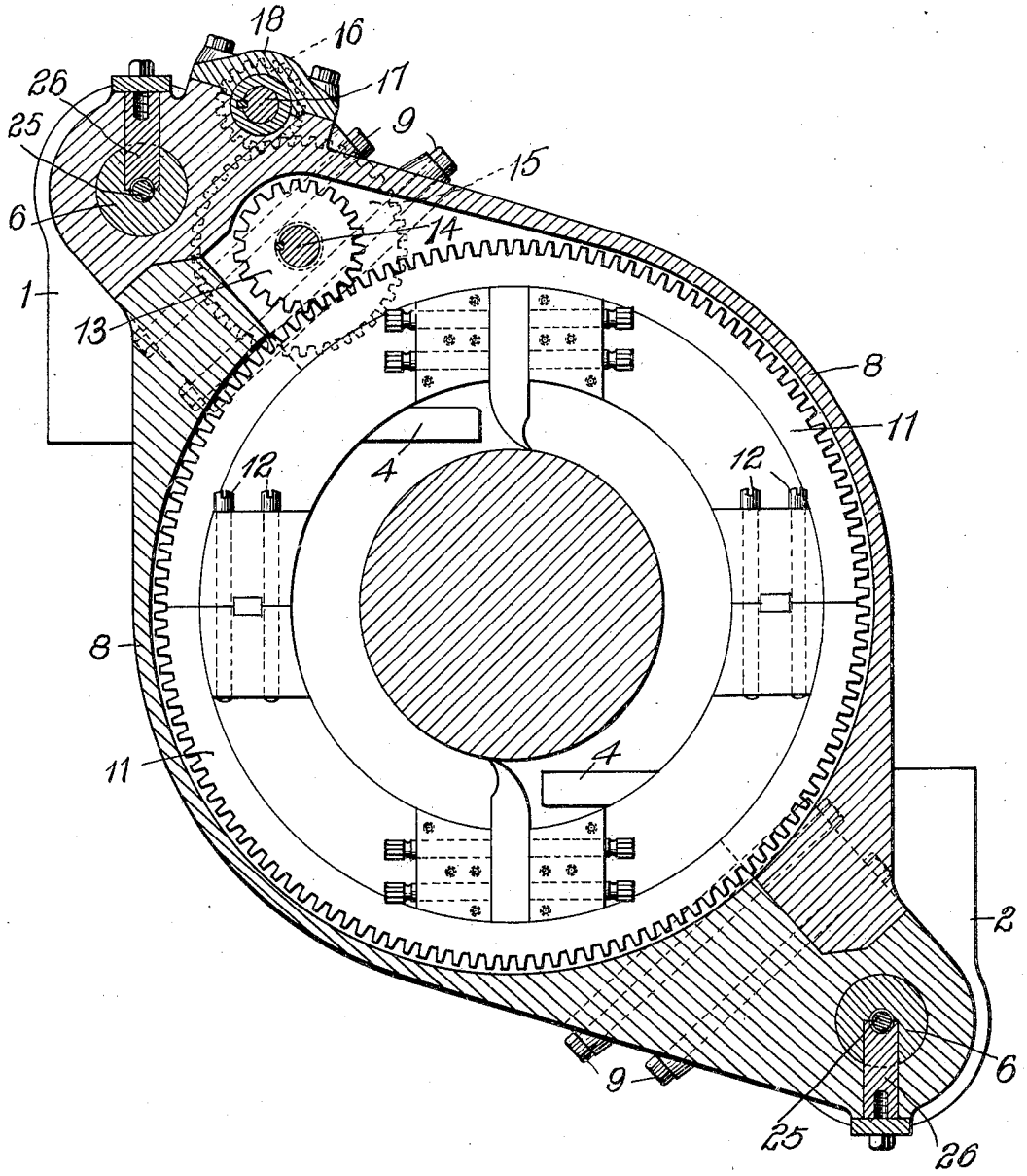
NO MODEL. 7 SHEETS—SHEET 4.

FIG. 4.



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NO MODEL. 7 SHEETS—SHEET 5.

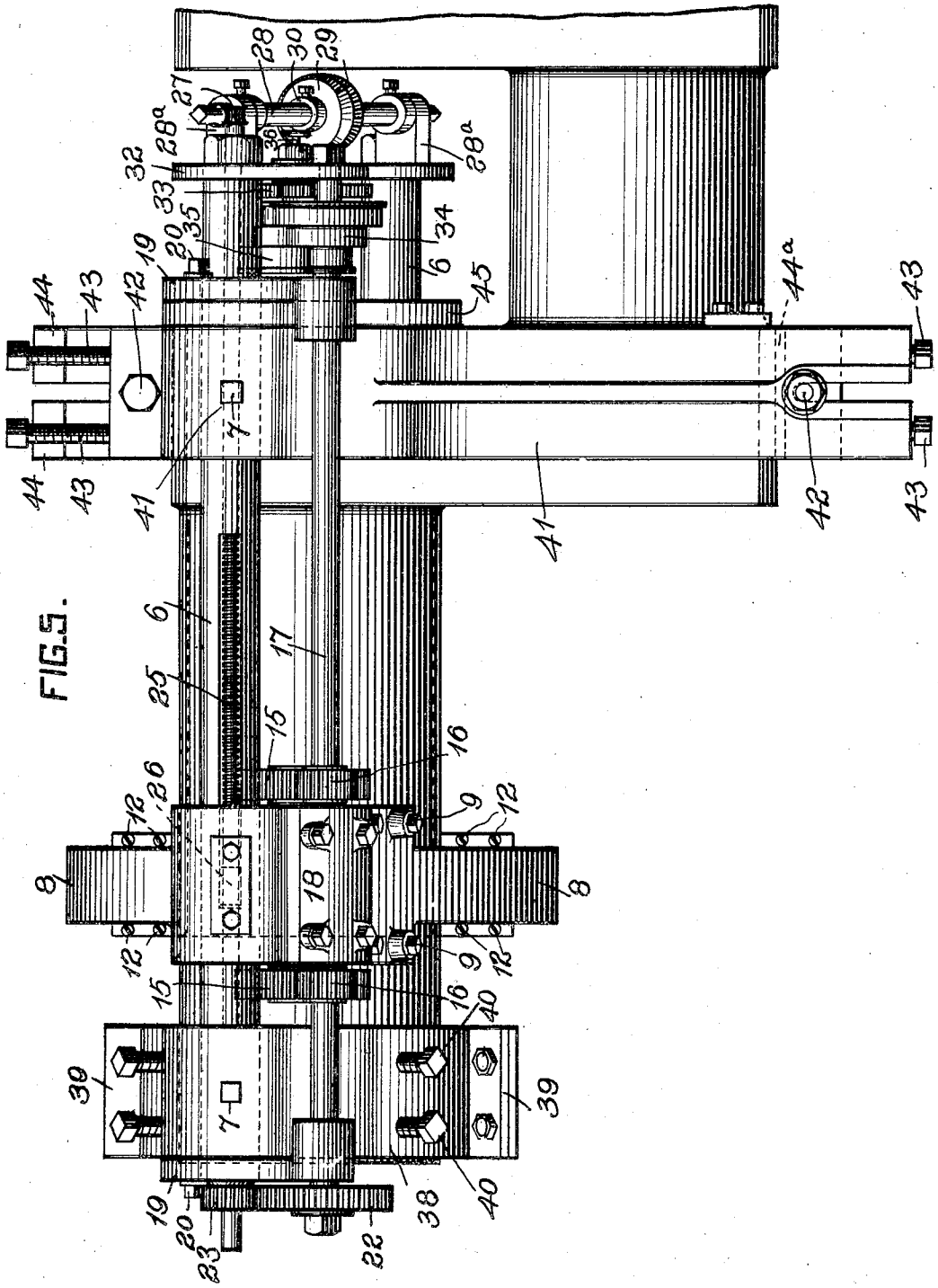

FIG. 5.

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No. 770,381. PATENTED SEPT. 20, 1904.

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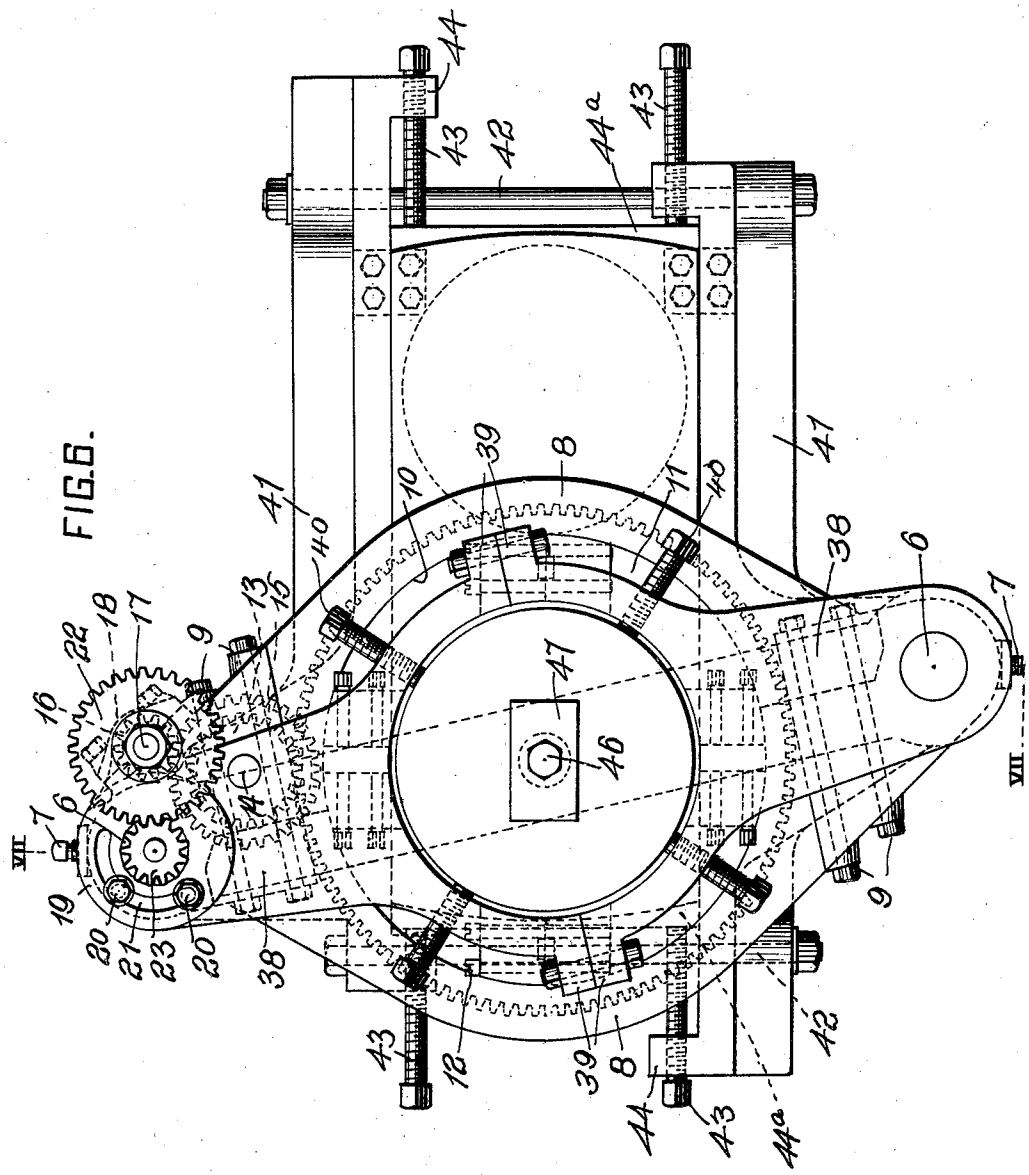
MECHANISM FOR TURNING WRIST PINS, &c.

APPLICATION FILED SEPT. 9, 1903.

NO MODEL. 7 SHEETS—SHEET 6.

FIG.6.



WITNESSES:
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NO MODEL. 7 SHEETS—SHEET 7.

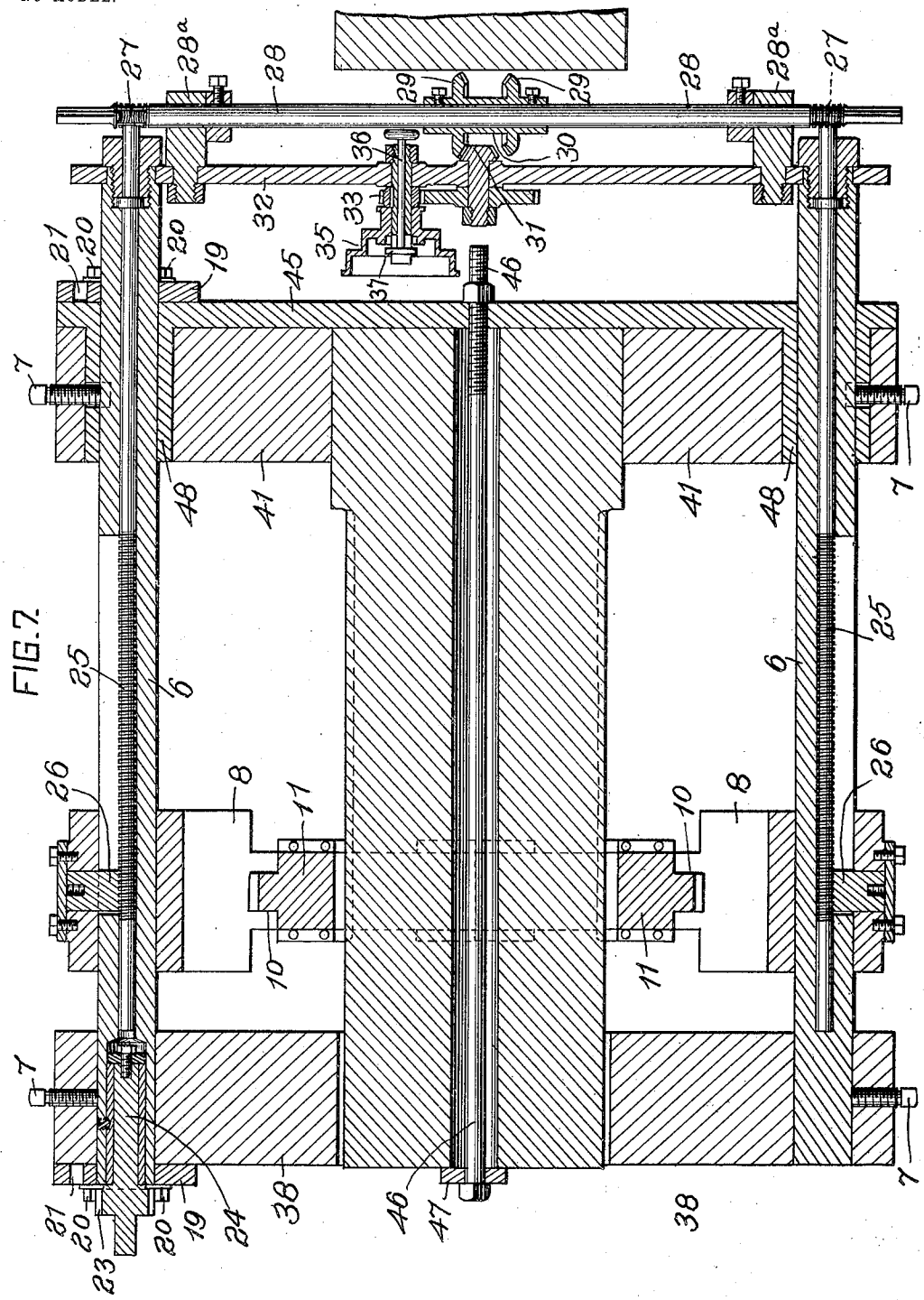

FIG. 7.

WITNESSES:
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No. 770,381. Patented September 20, 1904.

UNITED STATES PATENT OFFICE.

SAMUEL McMILLEN, OF PITTSBURG, PENNSYLVANIA.

MECHANISM FOR TURNING WRIST-PINS, &c.

SPECIFICATION forming part of Letters Patent No. 770,381, dated September 20, 1904.

Application filed September 9, 1903. Serial No. 172,456. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL McMILLEN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Mechanism for Turning Wrist-Pins, &c., of which inprovements the following is a specification.

The invention described herein relates to certain improvements in mechanism for turning the wrist-pins of cross-heads, crank-pins, and other circular parts of mechanical elements which cannot be conveniently mounted in a lathe.

The invention has for its object a construction and combination of the parts or elements of such a mechanism permitting of their adjustment, whereby the same mechanism can be employed for turning the pins of cross-heads and cranks varying in dimensions.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of my improved mechanism. Fig. 2 is a front elevation of the mechanism, showing it in position on the cross-head of engine, the cross-head being shown in dotted lines. Fig. 3 is a side elevation of the same. Fig. 4 is a sectional elevation, the plane of section being indicated by the line IV IV, Fig. 1. Fig. 5 is a plan view illustrating a modification adapting my invention to the turning of journals of crank-shafts. Fig. 6 is a side elevation of the same; and Fig. 7 is a sectional view on a plane indicated by the line VII VII, Fig. 6.

In the practice of my invention I employ two pairs of supporting-blocks 1 and 2, the members of one pair, as 1, being adapted to be secured on the upper side of the cross-head and the other pair on the lower side of the same. These blocks can be conveniently secured in position on the cheek-pieces *a* of the cross-head by bolts passing through slots 3, formed in flanges 4 on the blocks and screwing into threaded holes which are formed in the cheek-pieces *a* for bolts for setting out the brasses of the cross-head. The slots 3 permit of the adjustment of the supporting-blocks on the cheek-pieces, so as to bring the cutting-head in proper relation to the wrist-pin. It is preferred to employ retaining-plates 5, which are bolted to the supporting-blocks and project along the sides and ends of the cheek-pieces and prevent any movement of the blocks. The guide-bars 6 are mounted in suitable bearings in the outer ends of the supporting-blocks, which can be adjusted along the bars in accordance with the width of the cross-heads. When the blocks have been adjusted to proper position on the bars, they are held by means of set-screws 7.

The annular cutter-head carrier consists of two similar parts or sections 8, as shown, each part being provided with a bearing for one of the guide-bars 6. The free end of each section is detachably secured to the other section by means of bolts 9. Within the carrier is formed a raceway 10 for the reception of the cutter-head 11, which is also formed in sections held together by suitable means, as the bolts 12, passing through lugs in the sides of the cutter-head. The periphery of the cutter-head is toothed for engagement with the driving-pinion 13, secured on the shaft 14, which is mounted in suitable bearings in one of the sections of the carrier-ring 8. A gear wheel or wheels 15 are secured to one or both ends of the shaft 14 and intermesh with one or two pinions 16, which are so secured to the shaft 17 as to be driven thereby and yet free to move along the shaft with the carrier-ring 8. The shaft 17 is mounted in a bearing 18 on the carrier-ring, said bearing being located adjacent to the driving pinion or pinions 16, so as to hold the same in engagement with the gear wheel or wheels 15. The shaft 17 is supported near its ends in adjustable bearings, which can be made in the form of plates 19, arranged alongside of the supporting-blocks 1. As shown in Fig. 3, the plates are so mounted on the supporting-block as to be movable around a center coinciding with the axis of the upper guide-bar 6. In the construction shown the ends of the guide-bar project beyond the supporting-blocks 1 and form journals for the plates 19, which are held in their adjusted positions by means of bolts 20, passing through

curved slots 21 in the plates and screwing into the supporting-blocks. A gear-wheel 22 is secured to the shaft 17 and intermeshes with a pinion 23, secured to a pin 24, mounted in an axial socket in the guide-bar 6. The outer end of the pin is suitably constructed to be engaged by a rotating handle or connected to a flexible driving-shaft operated by an electric or other suitable motor.

It will be seen by reference to Fig. 3 that if the bearings for the ends of the shaft 17 were fixed to the supporting-blocks 1, the intermediate bearing being fixed to the carrier, the turning mechanism could only be applied to cross-heads or crank-shafts having the same thickness of cheek-pieces; but by mounting the ends of the shaft 17 adjustably on the supporting-blocks the mechanism can be applied to cheek-pieces varying widely in thickness. As, for example, if the cheek-piece is thinner than that shown in Fig. 3 the bearings for the shaft 17 would be loosened, and the cheek-pieces could be brought together against opposite sides of the cheek-pieces, thereby throwing the mechanism more nearly horizontal or into closer parallelism with the faces of the cheek-pieces, while the shaft 17 would move up toward the left in Fig. 3 around the axes of the guide-bars 6 as a center, the pinions 16 rolling around on the gear-wheels 15. If the cheek-pieces were thicker than that shown in Fig. 3, then the mechanism would be thrown toward a vertical position, and the shaft 17 would move down around the axis of the guide-bar, the movement being to the right. By this construction the mechanism can be applied, as will be readily understood, to any sizes of cross-heads or cranks as required.

In order to effect a feed of the carrier back and forth between the supports, threaded rods 25 are arranged in longitudinal openings in guide-bars 6 and engage with threaded blocks 26, secured in the carrier and projecting into transverse openings or recesses in guide-bars 6. Worm-wheels 27 are secured on the projecting ends of these rods 25 and are arranged to engage worms on the ends of a shaft 28, the worm and worm-wheel at one end being right-handed and at the opposite end left-handed, so as to get a uniform feeding movement of the carrier. This shaft 28 is mounted in bearings in blocks 28^a, secured to the plate 32, which is supported in the projecting ends of the guide-bars 6. As shown in Fig. 2, the ends of this shaft 28 may be made angular for the reception of a suitable wrench or handle, and the feed of the carrier effected by hand. When, however, it is desired to effect a power-feed of the carrier, beveled pinions 29 are formed on the sleeve 30, which is movably mounted upon the shaft 28. These beveled pinions are adapted to intermesh with a corresponding pinion 31, carried by a stud mounted in suitable bearings on the supporting-plate 32. This stud is also provided with a gear-wheel intermeshing with a pinion 33, driven by a cone-pulley 35, which in turn is driven by cone-pulley 34 on the shaft 17. The outer end of this shaft is supported in a curved slot 32^a in the plate 32, so as to permit of the adjustment of the supporting-blocks, as heretofore described. In order to stop the feed of the carrier without necessarily stopping the cutting operation, the pinion 33 is secured to the stud and the cone-pulley, which is loosely mounted on a stud carried by the plate 32. In order to lock this cone-pulley to the stud, a movable rod 36 is passed through the stud and is provided with a head 37, which will engage a notch in the pulley and stud, thereby locking these parts together and causing the operation of the feed mechanism. When it is desired to reverse the direction of feed, the set-screws or other means employed for locking the sleeve 30 to the shaft 28 are loosened and the sleeve shifted so as to bring the opposite pinion into engagement with the driving-pinion 31.

For turning the journals of crank-shafts the blocks whereby the cutting mechanism is secured to the shaft are somewhat modified in construction, as shown in Figs. 5, 6, and 7. As the journals are outside of the cheek-pieces of the crank, one member of each pair of supporting-blocks must be secured to the circular portion of the shaft. Supporting-blocks 38 are formed with concave seating portions for the reception of the circular portion of the shaft. The blocks are drawn to position around the shaft by means of bolts passing through lugs 39 on the blocks. In order to prevent any slipping of the blocks 38 along the shaft, they are provided with set-screws 40, which bear at their ends against the shaft. The blocks 41, forming the other members of the pairs, are made longer than the cheek-pieces, to which they are to be secured, as shown in Figs. 5 and 6, and have their ends slotted for the reception of the clamping-bolts 42. Means are provided for adjusting the blocks 41 in the cheek-pieces to bring the axes of the shaft and guide-bars into alinement. A convenient construction for this purpose consists of set-screws 43, passing through lugs 44 on the blocks and bearing against the ends of the cheek-pieces. As the ends of the cheek-pieces are curved, as shown in Fig. 6, it is preferred to interpose bearing-pieces 44^a between the ends of the cheek-pieces and screws 43 to afford flat bearings for the screws.

It being undesirable to form holes in the cheek-pieces or shaft for the reception of holding-bolts, the supporting-blocks are clamped, as described, on opposite sides of the cheek-pieces and shaft; but the frictional grip thus provided is not always sufficient to hold the cutters to their work. I therefore provide a bracing-bar 45, extending across the inner

face of the cheek-piece of the crank and connected at its ends to the cheek-blocks 41. As the supporting-blocks are so adjusted that the axes of the guide-bars 6 and the shaft are in line and as the brace-bar is so secured to the blocks that it will coincide with the line passing through said axes, the brace-bar can be secured at a point intermediate of its ends by a bolt entering an axial opening in the shaft. Such an opening can be formed without in any way weakening the shaft. Frequently the shafts are made with an axial opening, and in such cases the brace-bar is secured in position by a long bolt, as 46, passing through the brace-bar, the axial opening in the shaft, and a transverse bearing-piece 47, against which the head of the bolt or the tightening-nut bears. When the carrier 8 is being fed from left to right in Fig. 5, the guide-bars 6 will pull on the cheek-blocks 41, which are held from movement by the brace-bar, its ends being secured to the block, while its middle portion bears on the cheek-piece of the crank. When the carrier 8 is fed from right to left in Fig. 5, it will effect a push in the guide-rods 6, cheek-blocks 41, and ends of the brace-bar, which is held intermediate of its ends by the bolt 46.

While any suitable means may be employed for securing the ends of the brace-bar to the cheek-blocks, it is preferred to form hollow bosses 48 on the bar 45, said bosses or journals projecting into openings formed in the blocks. The bosses or journals form bearings for the guide-bars 6, which, as shown in Fig. 7, project into the bosses. The bosses are slotted to permit of the passage of the set-screws 7, employed for holding the supporting-blocks in position on the guide-bars. As the set-screws pass through slots in the bosses or journals 48, they will prevent any withdrawal of the latter from the blocks.

In applying the mechanism to a crank-shaft the bolt 46 is passed through the brace-bar and secured in the axial opening in the shaft. This bolt then forms a pivotal support for the bar, and the bosses or journals on the bar serve as pivotal supports for the blocks, which when so supported can be easily adjusted to position on the cheek of the crank.

It will be understood that except for the changes in construction of the supporting-blocks to adapt them to the shape of the parts on which they are clamped the mechanism is constructed as hereinbefore described. When the brace-bar 45 is employed, the plate 19, supporting the shaft 17 at that end of the machine, is arranged outside of the brace-bar and adjustably secured thereto.

I claim herein as my invention—

1. In a mechanism for turning wrist-pins, &c., the combination of an annular carrier, an annular tool-head supported by the carrier, means for rotating the tool-head, and supporting-blocks adjustably connected to the carrier on opposite sides of a plane including the axis of the carrier, substantially as set forth.

2. In a mechanism for turning wrist-pins, &c., the combination of an annular carrier, an annular tool-head mounted in the carrier, means for rotating the tool-head, guide-bars supporting the carrier, and supporting-blocks adjustably mounted on the guide-bars on opposite sides of a plane including the axis of the carrier, substantially as set forth.

3. In a mechanism for turning wrist-pins, &c., the combination of two pairs of supporting-blocks, guide-bars mounted on said blocks, a sectional annular carrier mounted on the guide-bars, a sectional annular tool-head, and means for rotating the tool-head, substantially as set forth.

4. In a mechanism for turning wrist-pins, &c., the combination of two pairs of supporting-blocks adapted to be secured to the article to be operated on, guide-bars mounted on the blocks, an annular carrier movably mounted on the guide-bars, means for shifting the carrier along the guide-bars, an annular tool-head mounted on the carrier, and means for rotating the tool-head, substantially as set forth.

5. The combination of an annular carrier, guide-bars for supporting said carrier and arranged on opposite sides of a plane including the axis of the carrier, an annular tool-head mounted in the carrier, supporting-blocks adjustably mounted on the guide-bars, a driving-shaft operatively connected to the tool-head, and bearings for the driving-shaft adjustably mounted on the supporting-blocks, substantially as set forth.

6. In a mechanism for turning wrist-pins, &c., the combination of an annular carrier, guide-bars for supporting the carrier and arranged on opposite sides of a plane passing through the axis of the carrier, supporting-blocks adjustably mounted on the guide-bars, an annular tool-head, driving-shaft operatively connected to the tool-head, feed mechanisms carried by the guide-bars, and means for simultaneously operating both feed mechanisms, substantially as set forth.

7. In a mechanism for turning wrist-pins, &c., the combination of supporting-blocks arranged to be secured to the article operated on, on opposite sides of a plane including its axis, guide-bars supported by said blocks, an annular carrier movably mounted on the guide-bars, a tool-head mounted on the carrier, a driving-shaft operatively connected to the tool-head, bearings for such shaft adjustably mounted on the supporting-blocks, feed mechanism for the carrier, and driving connections from the driving-shaft to the feed mechanism, substantially as set forth.

8. In a mechanism for turning wrist-pins, &c., the combination of supporting-blocks, guide-bars supported by said blocks, an annular carrier movably mounted on the guide-

bars, a tool-head mounted on the carrier, a driving-shaft operatively connected to the tool-head, threaded shafts arranged in axial openings in the guide-bars and threaded blocks detachably secured to the carrier and adapted to project into slots in the guide-bars, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SAMUEL McMILLEN.

Witnesses:
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