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G. H. OBER.

LATHE FOR TURNING WOOD.

No. 433,023. Patented July 29, 1890.

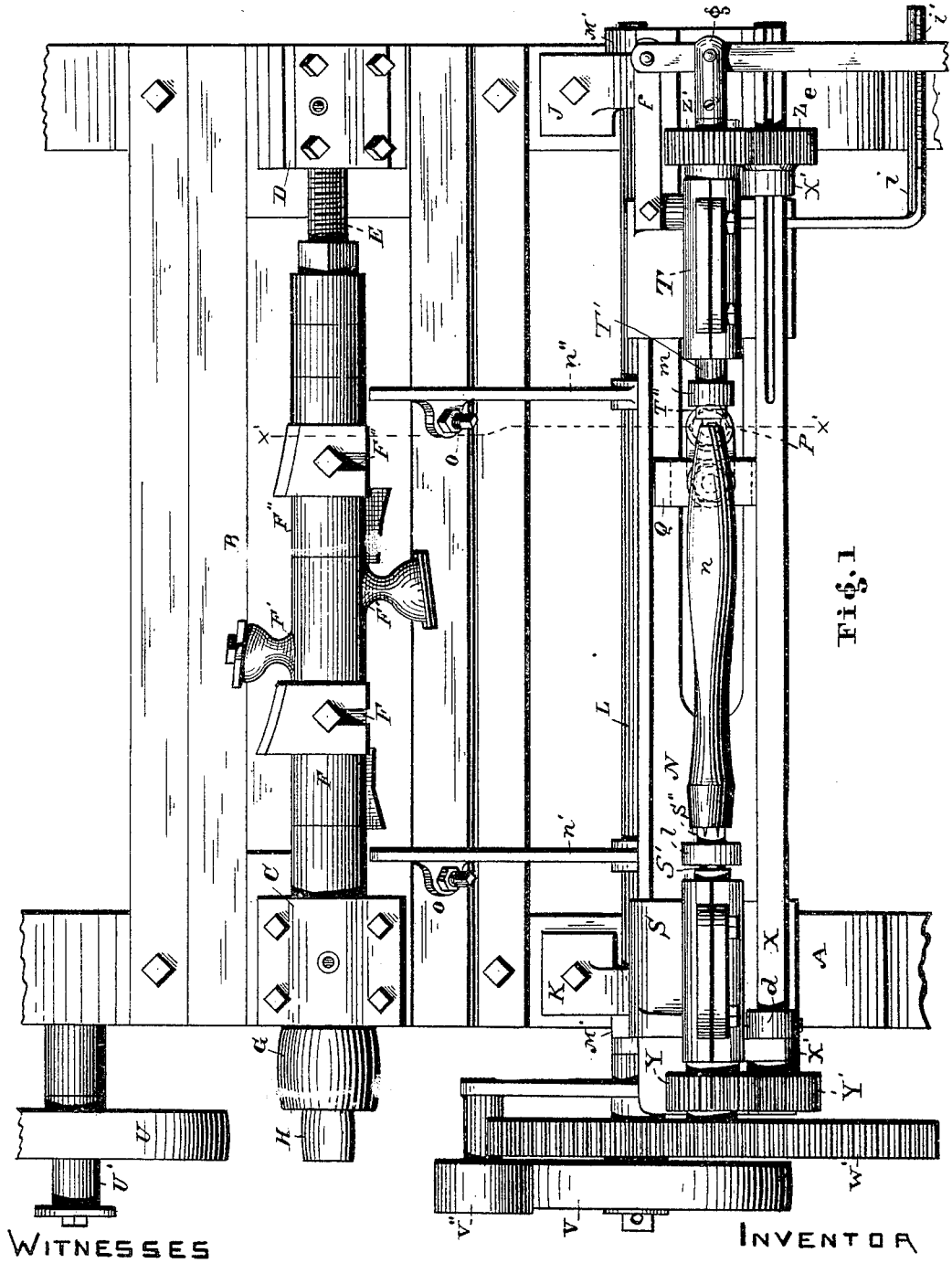

Fig. 1

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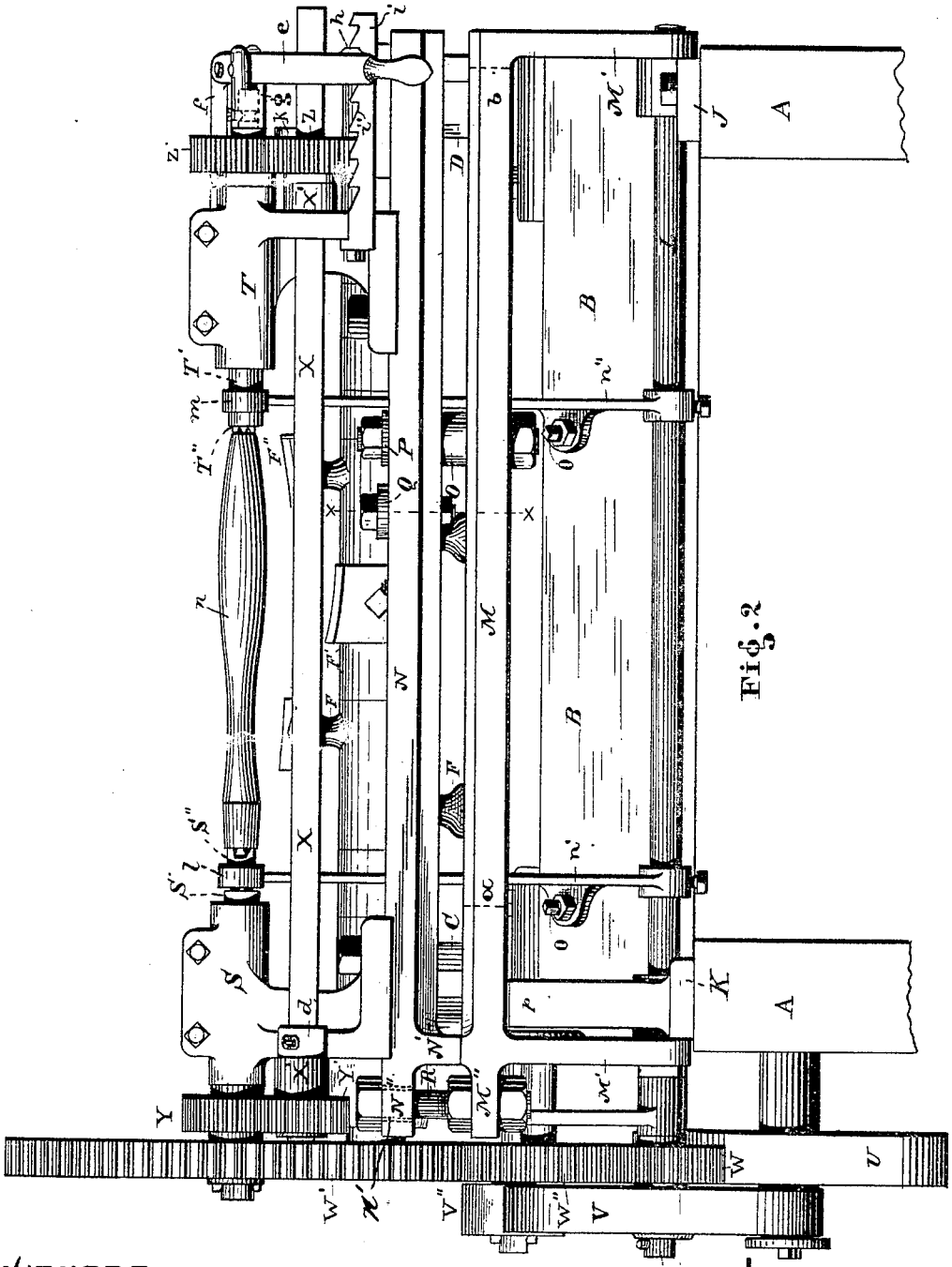

Fig. 2.

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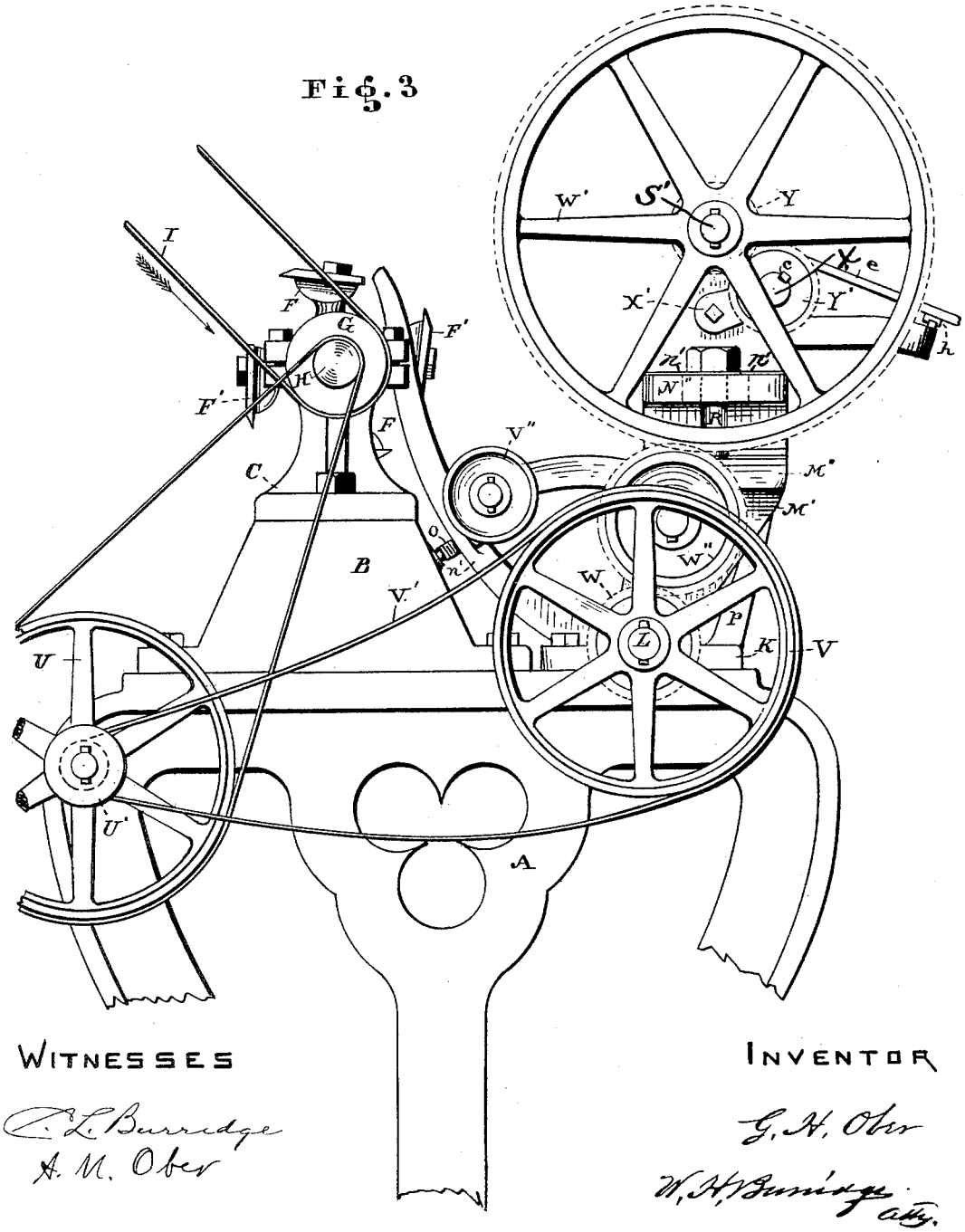
Fig. 3



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LATHE FOR TURNING WOOD.

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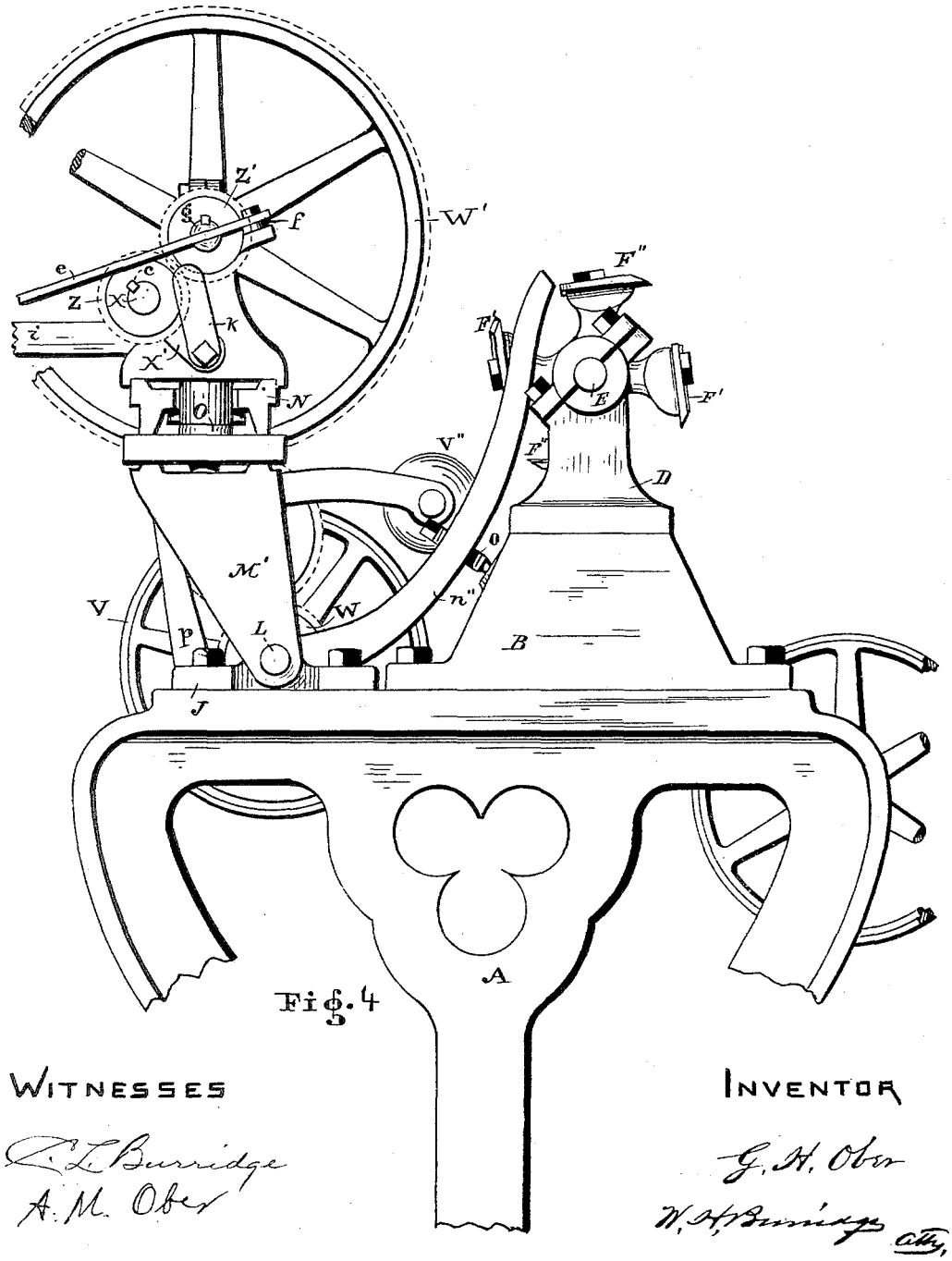

Fig. 4

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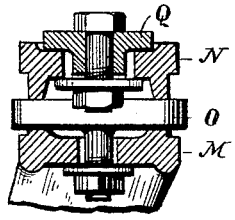
Fig. 5



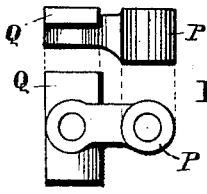
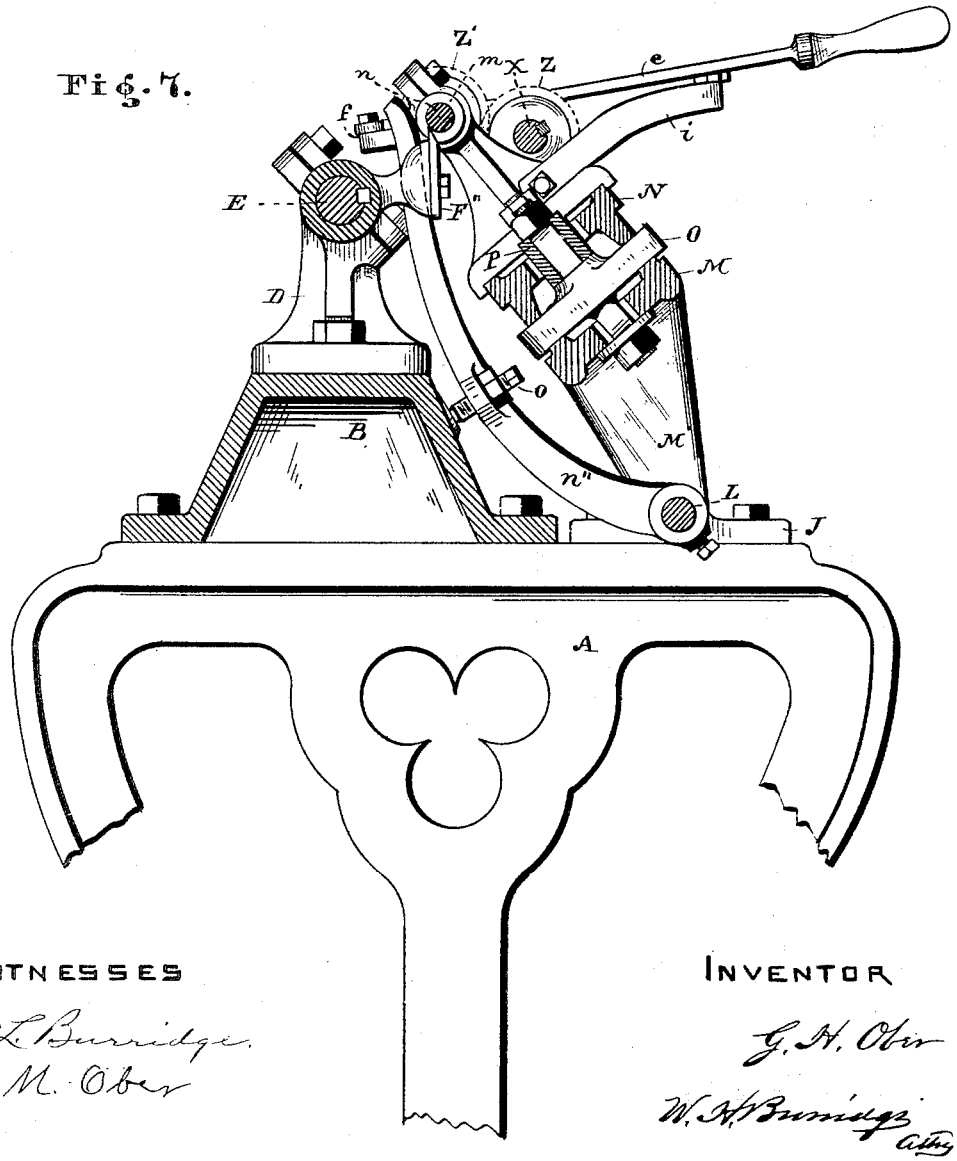


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE H. OBER, OF CHAGRIN FALLS, OHIO.

LATHE FOR TURNING WOOD.

SPECIFICATION forming part of Letters Patent No. 433,023, dated July 29, 1890.

Application filed September 3, 1888. Serial No. 284,479. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. OBER, a citizen of the United States, residing at Chagrin Falls, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Lathes for Turning Wood; and I hereby declare that the following is a full, clear, and exact description thereof.

My improvement relates to lathes for turning various-formed articles of wood—such as hammer-handles, spokes, whiffletrees, and brush and knife handles; and the invention consists in the construction of certain operative parts thereof, by the application of which variations in form of the article to be turned may be obtained with one and the same position and form of knives or cutters. The improvement also renders it admissible that one extremity of said articles may be rounded transversely while the other is oblong, triangular, square, or any polyganous form.

That the improvement may be fully understood, reference will be had to the annexed specification and the accompanying drawings, in which—

Figure 1 is a plan view of a lathe provided with the improvements above referred to. Fig. 2 is a front side elevation of the same. Fig. 3 is a front end elevation, and Fig. 4 a rear end elevation. Fig. 5 is a detached section vertically on line *x x*, Fig. 2. Fig. 6 represents detail views of a part shown in section in Fig. 5; and Fig. 7 is a cross-section on line *x' x'*, Fig. 1.

In all the views a portion of the frame or legs of said lathe is broken away.

Like letters of reference refer to like parts in the drawings and specification.

The machine illustrated in the drawings belongs to that class of wood-lathes having a series of adjustable cutter-heads and cutters extending over the entire length of the article to be turned, thus not requiring to be slid upon the revolving spindle. Heretofore in such lathes the profile of the article was determined by the particular displacement of the knives themselves. By the application of my improvements, however, an unlimited number of peculiarly-shaped articles can be produced without changing the knives or cutter-heads. Only articles of similarity in cross-section through the entire length could be turned with the machines heretofore used, whereas with the machine above referred to the cross-sections at or toward either end may be entirely different from each other.

In all the figures, A represents a part of the frame or legs of the machine.

B indicates the bed-plate, and C D are the stands for the spindle E, upon which spindle are mounted the cutter-heads F F' F''. They are set relatively in succession to each other, as seen in Figs. 1 and 2. The spindle E projects through the stand C, and the extension thereof is provided with the pulleys G H. The pulley G receives the driving-belt I for rotation of the cutter-heads, and by means of the pulley H motion is imparted to the mechanism, whereby the article to be cut or formed is held to the knives and receives the necessary adjustments for producing the desired form of the hammer-handle or whatever it may be.

The bearings J K are supported by and secured to the frame or legs A. The shaft L is held within said bearing and extends over the entire length of the frame, as seen in Figs. 1 and 2. The rocking frame M, with its downwardly-projecting flanges M', is pivotally mounted on the shaft L, as seen in Figs. 2 and 4. Thus it can be swung to and from the cutter-heads, above alluded to, and carry its attachments, hereinafter described, with it.

On top of the rocking frame M is set the carrier N, with its extension N' near the front end thereof. The rear end is held suspended by means of the clamp-pivot O, as seen in Figs. 2, 5, and 7. The lower end of said clamp-pivot extends through a slot in the rocking frame M and is provided with screw-thread and nut, by means of which it can be secured on the rocking frame M at any point of the slot, which runs from *a* to *b*, as seen in dotted lines of Fig. 2. The upper part of said clamp O projects through the slot formed by the bisection of the carrier N, and is also provided with screw-thread and nut to enable a connection to be made with the sleeve P, which is a part of the plate Q, Figs. 5 and 6. The plate Q is attached to the carrier in like manner as the clamp-pivot is to the rocking frame in order to enable adjustment of

the plate on the carrier, as well as the clamp on the rocking frame, Fig. 5. At the front end both the carrier and frame have a flange N″ and M″ and a bolt R, Fig. 2, by means of which bolt contact of the extension N′ on the rocking frame M is maintained regardless to the position of the clamp-pivot O, while the carrier vibrates laterally. The bolt R remains stationary in the flange M″, and a slot (shown in dotted lines n', Figs. 2 and 3) in the flange N″ allows vibration of the carrier.

On the carrier N are bolted the spindle-stocks T S. Motion is imparted to the spindle of the stock S by means of belting and gearings depending for power on the main belt I, which belt, as above stated, drives the pulley G and with G rotates the pulley H. The belt on the pulley H drives the pulleys U U′, and U′ drives the pulley V by means of the belt V′ and the tightener V″. The pulley V has a gearing W secured thereto; but both revolve loosely upon the shaft L. From the gearing W the spindle S′ is driven by means of the wheel W′ and the intermediate gearing W″. The small gearing Y, located between the end of the spindle-stock S and the gearing W, drives the gearing Y′ of the shaft X, which shaft is provided with a sliding gearing Z, which engages into the gearing Z′ of the spindle T′ of the stock T. The shaft X is journaled in the adjustable brackets X′ X′, which enable the setting of the gearings on said shaft either in or out of engagement with the gearings Y and Z′.

The gearing Z is provided with a key, as seen at c in Fig. 4. Said key is fitted into a groove of the shaft X to allow of adjustment of the wheel Z when it becomes necessary to move the spindle-stock T. The collar d retains the shaft X and gearing Y′ in proper relation to the gear Y. Both the spindles S′ and T′ have centers S″ T″ inserted in sockets of the inner ends thereof. (See Figs. 1 and 2.) The centers are or may be like those used in ordinary wood-lathes. The spindle T′ is provided with a rapid adjustable centering device, by means of which said spindle can be quickly operated for either putting the material between the centers or taking the finished articles from out the same. The device consists of the lever e, which at one end is pivoted to the arm f of the spindle-stock T, to slide the spindle T′ either out or in by means of the coupling g, which also has a pivotal connection with said lever and a loose connection with the spindle—that is, the spindle T′ can revolve while the coupling remains stationary, but longitudinally the movement of the spindle and coupling is simultaneous. The long arm of the lever is provided with a handle for operation, as seen in Figs. 2 and 5. Near the end of said arm is a downwardly-projecting lug, which engages into one of the notches i' of the rack-bar i when set to hold the material between the centers S″ T″.

To take the finished article n out of the machine, then all that is necessary is to lift the lug from out the notch and to withdraw the handle e, which will relieve said article from engagement of the centers S″ T″. As seen in Figs. 1 and 2, the gearings Z and Z′ are constantly held against the rear end of the spindle-stock T′ by means of the plate k. Thus the spindle and shaft may be moved without disturbing the wheels Z and Z′. (See Figs. 2 and 4.) With the centers are connected the patterns l and m, which are to determine the form of the article at or toward its respective end. For instance, if the pattern l, Fig. 2, is of an elliptical form, then the article at that end will be also elliptical and round at the opposite end if the pattern m be round, as shown in Figs. 2 and 7.

The article n, as shown in the drawings, Figs. 1, 2, and 7, represents a hammer-handle. The ends in this case are designed to be round and elliptical, respectively, and if it is essential that the round part should start from the end, then the clamp-pivot O must be set directly under that end thereof, in so far as one end is elliptical in cross-section and requires a vibration of the carrier N. A round section of the hammer-handle can only be produced where vibration ceases, which is at the pivotal center or clamp O.

When the material from which the hammer or brush handle is to be made is once secured between the centers, then the rocking frame M is swung on its pivotal bearings until the patterns l and m come to lie on the gage-levers n' n'', by means of which the size of the handle at either end can also be regulated independently of each other. Said levers are curved and attached to the shaft L, as seen in Figs. 2, 4, and 7. They are provided with set-screws o, which rest upon the inner side of the bed-plate B and maintain the free end of said levers at interchangeable distances from the axis or center of the cutter-heads. The patterns l and m bear against the free end of said levers, and it is thus that the thickness of the handle can be adjusted after the form is or was determined conjointly by the displacement of the knives on the heads and the clamp-pivot in relation to the carrier and rocking frame.

As above stated, the patterns l and m are secured to the spindles S′ T′ and revolve with the same to act as guides for the formation of the article to be finished. If both the patterns are of similar or a like form, but the article to be produced by the aid of them is to be tapering longitudinally, then the pivot O must be so set as to admit the required inclination of the axis through the spindle-centers and also contact of the patterns on the so adjusted gage-levers.

The manner in which the carrier is connected with the rocking frame enables a simultaneous vibration of the carrier and frame actuated by the revolving patterns. When in contact with the gage-levers, it also results in vibration of the carrier only, according to the

position of the pivot in relation to the operative parts. The carrier vibrates in the tangential planes of the circle described by the swinging frame M; or, in other words, the lines of vibration of the carrier N are diverging at right angles to the vertical planes in which the frame M swings.

The tightener V″ swings with the rocking frame M and will lie upon the belt V′ with sufficient stress to cause rotation of the pulley V and all the gearings depending therefrom for motion. As shown in Figs. 2, 3, and 4, the rocking frame M and attachments are withdrawn from contact with the gage-levers n' n''. Said frame then is resting upon the arm p projecting up from the bearing K. While resting the face-plate of said frame is in a horizontal position and the belt V′ relieved from the stress of the tightener; hence is unable to turn the pulley V.

As above stated, articles dissimilar in cross-section at or toward the ends can be turned by the aid of these improvements. For instance, an article may be turned which is elliptical for a certain part of its length and round for the remainder thereof. Then the pivot is set at or near that point where the round portion begins and the elliptical portion ends. The knives and gage-levers in that case are so set that only one pattern for shaping of the wood is in contact with its respective gage-lever, and the knives cut only over a portion at the time, (elliptical portion first, if so chosen.) After the elliptical part—that is, the section between the elliptical or oval pattern and the pivot O—is turned then the carrier is tipped or inclined toward the knives, so that the round pattern comes in contact with its gage-lever, when cutting of the cylindrical part begins. This tipping of the carrier is done without stopping either the cutters or lifting the carrier therefrom; hence the operation of the knives is continuous, inasmuch as certain portions of the knives come successively into action, while the carrier is tipped.

What I claim, and desire to secure by Letters Patent, is—

1. In combination, in a lathe for cutting various forms, the cutters, the centers for holding the material to be operated on, a supporting-plate N for said centers, a frame for holding said plate, and an adjustable pivotal connection between the frame and the plate, substantially as described.

2. In combination, the cutters, the centers for holding the material, a supporting-plate therefor, a swinging frame M, movable toward and from the cutters and carrying the plate N, and an adjustable pivotal connection between said plate N and swinging frame, substantially as described.

3. In combination, the cutters, the spindles and centers, the slotted plate N, the slotted frame M, and the adjustable pivotal connection, comprising the clamp o, the sleeve P, and clamp-plate Q.

4. In combination with a lathe for turning various forms, the rocking frame M, arranged to swing in fixed bearings and having a slot in the face-plate thereof, the slotted carrier N, the spindle-stocks S T, with driving mechanism, the clamp-pivot O, and the clamping-plate with a sleeve arranged in the slots of said frame and carrier, in the manner and for the purpose set forth.

5. The combination, with a rocking frame having an adjustable clamp-pivot secured in the face-plate thereof, and the carrier N, having an adjustable clamping-plate, of a sleeve P, arranged in vibratile connection with said clamp-pivot to guide said carrier upon said frame, in the manner as and for the purpose set forth.

6. In a lathe for turning various forms, the combination of a rocking frame M, having a slot in the face-plate thereof, a carrier N with a slot, a clamp with a pivot O, and a clamp with a sleeve P, engaging for adjustable vibratile connection of said rocking frame and carrier, constructed and arranged substantially as set forth.

7. In a lathe for turning irregular forms, the carrier N, bisected or slotted, and plate Q with a sleeve within said bisection, in combination with the slotted rocking frame M and the clamp-pivot O, constructed and arranged substantially as and for the purpose set forth.

8. In combination with the spindle-stocks S T of the carrier N, the grooved shaft X with movable gearing Z, journaled in adjustable brackets for engagement with the gearing of the stock T, constructed and arranged substantially as and for the purpose set forth.

9. In a lathe for turning irregular forms, the combination of revolving cutter-heads, a rocking frame M, a carrier N, having loose connection with and longitudinal adjustment upon said frame, the spindle-stocks S T with brackets and gearings, and the shaft X with gearings for simultaneous rotation of the spindles of said stocks, constructed and arranged substantially as and for the purpose set forth.

10. In a lathe for turning various forms, the combination of the rocking frame M, carrier N, clamp-pivot O, and sleeve P with plate Q, the clamp of said pivot and said plate having adjustable connection with said frame and carrier and the sleeve vibratory motion upon said pivot, constructed and arranged substantially as and for the purpose set forth.

11. In a lathe for turning irregular forms, the combination of the rocking frame, a clamp-pivot arranged in a slot of said frame, the carrier of the spindle-stocks, and a clamping-plate with a sleeve in the slot of said carrier for vibratory connection with said pivot, substantially as shown and described.

12. In combination, the cutters, the support N, the stocks S and T on the support N, the said stock T carrying a spindle T′ and being adjustable on said support N, and means for actuating the said spindle, consisting of the pinion Z′ thereon, the shaft X, and the pin-

ion Z, adjustable longitudinally on said shaft and adapted to mesh with the pinion Z′, substantially as described.

13. In a lathe for turning various forms in a single piece of wood, the carrier N, having an adjustable pivoted connection with the clamp-pivot O, arranged in connection with the rocking frame, in combination with the rotary cutters having irregular cutting-edges extending over the entire length of the article to be shaped, and driving mechanism arranged to operate conjointly therewith, substantially as and for the purpose described.

14. In combination, in a lathe for turning various forms, the centers for holding the material to be operated upon, the pattern-disks and their bearings, a supporting-plate for said centers, a frame for holding said plate, and an adjustable pivoted connection between the frame and the plate, substantially as described.

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

GEORGE H. OBER.

Witnesses:
W. H. BURRIDGE,
B. F. EIBLER.