No. 813,187. PATENTED FEB. 20, 1906.

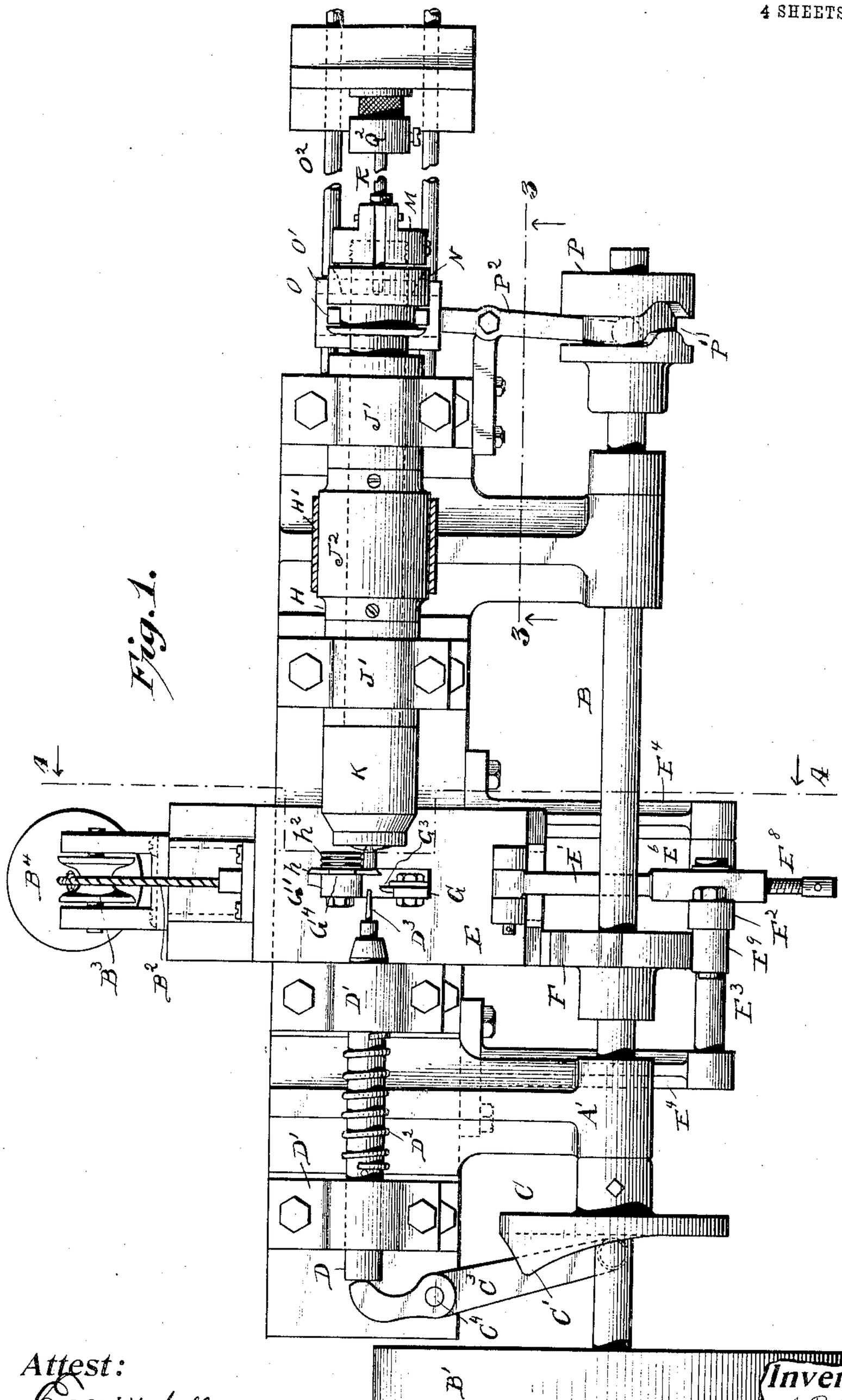
A. R. WEISZ.

AUTOMATIC TURNING, SHAPING, AND FINISHING MACHINE.

APPLICATION FILED JULY 13, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



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C. E. Mitchell
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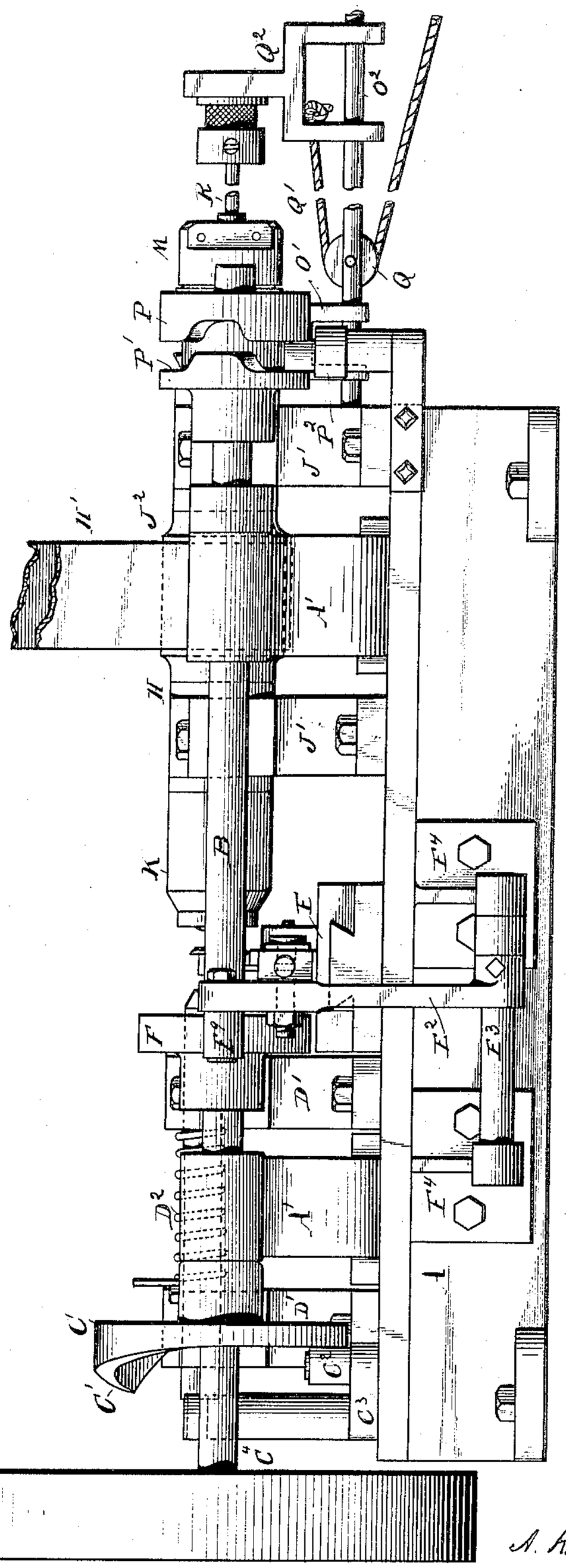
Fig. 2.



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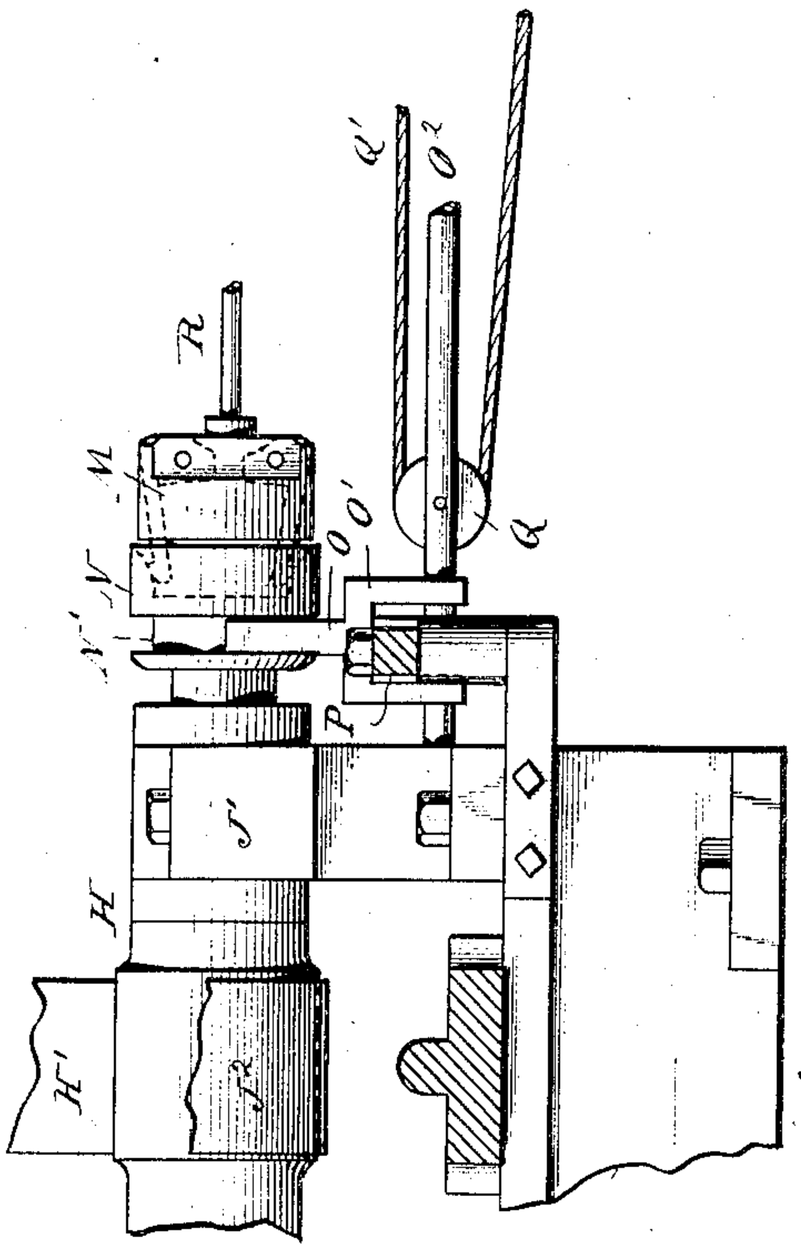

Fig. 5.

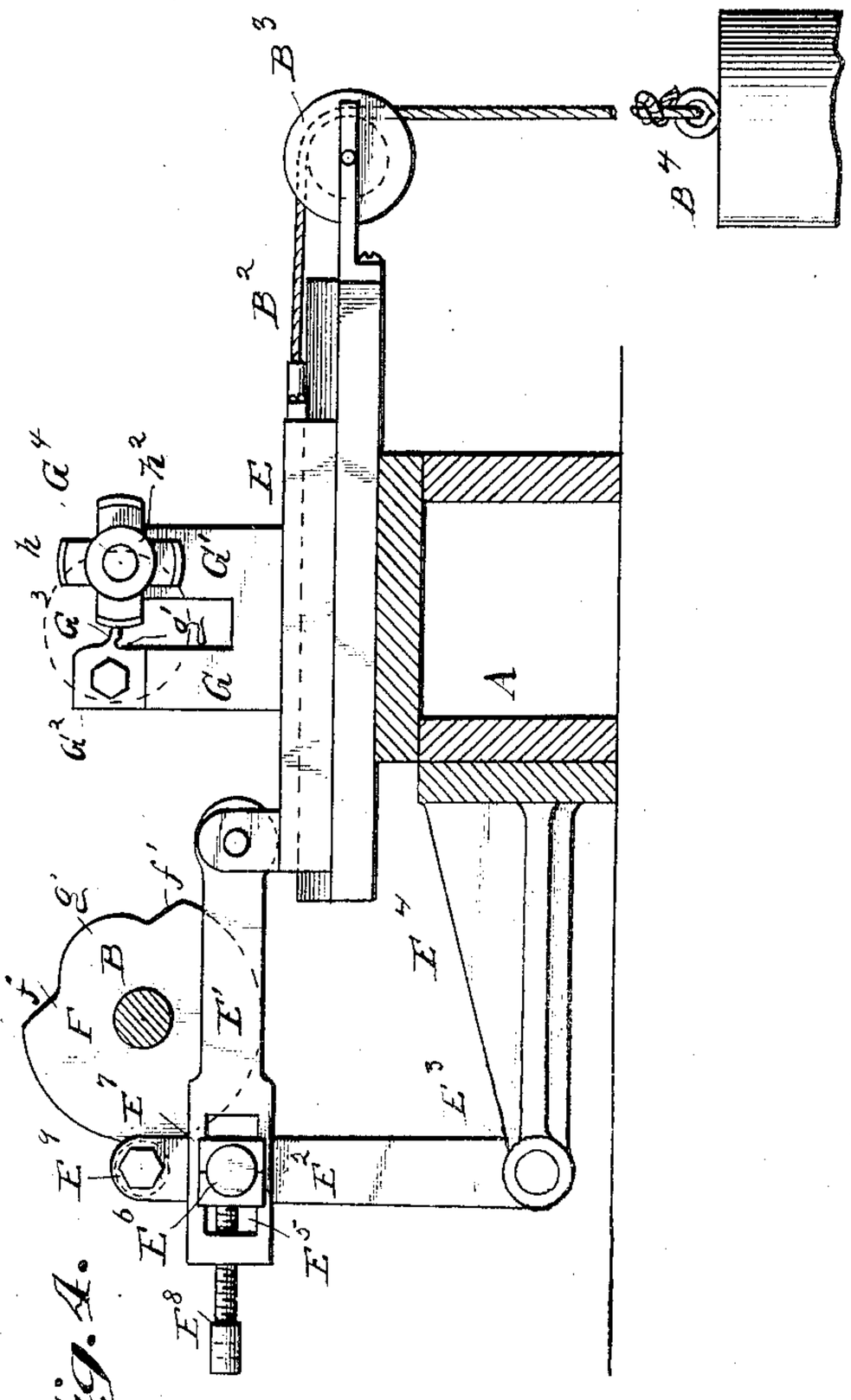

Fig. 4.

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4 SHEETS—SHEET 4.

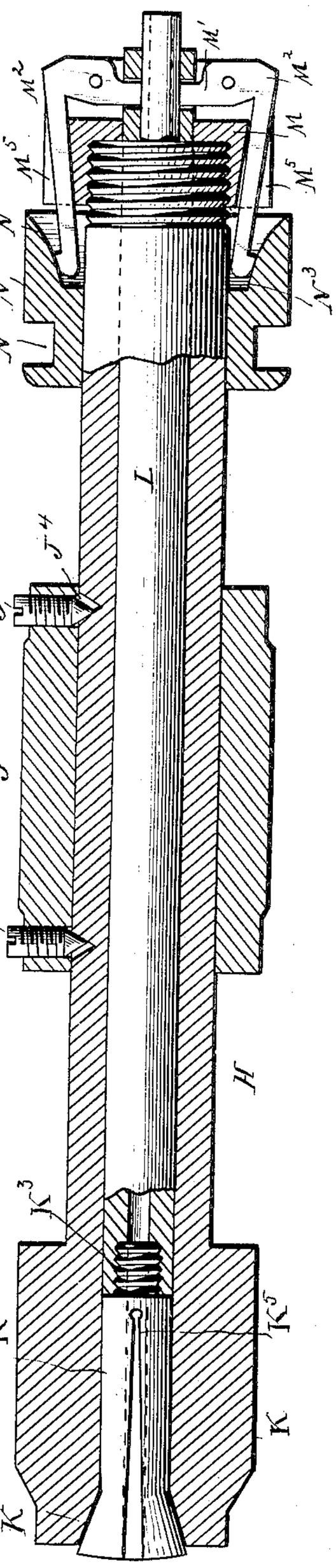

Fig. 5.

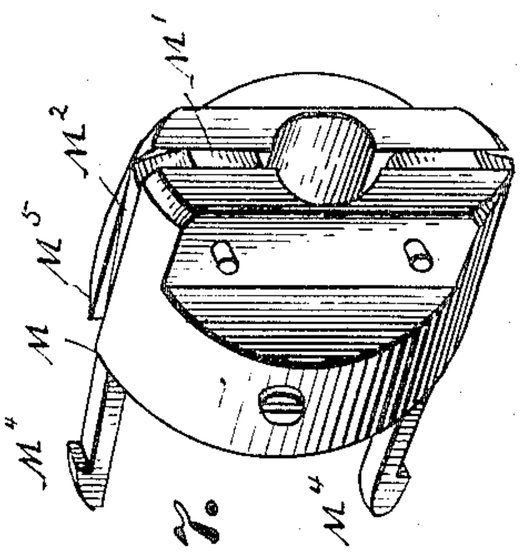

Fig. 7.

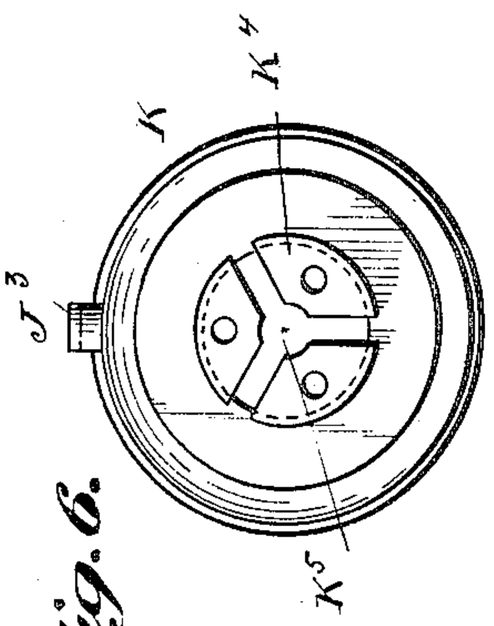

Fig. 6.

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by Oscar F. Gunz
Atty.

UNITED STATES PATENT OFFICE.

ALBERT R. WEISZ, OF NEW YORK, N. Y., ASSIGNOR TO THE MATCHLESS CIGAR LIGHTER MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

AUTOMATIC TURNING, SHAPING, AND FINISHING MACHINE.

No. 813,187. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed July 13, 1905. Serial No. 269,472.

To all whom it may concern:

Be it known that I, ALBERT R. WEISZ, a citizen of the United States, residing at the city of New York, borough of Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Automatic Turning, Shaping, and Finishing Machines, of which the following is a specification.

This invention relates to improvements in automatic turning, shaping, and finishing machines; and the object of my invention is to provide a new and improved machine of this kind which is simple in construction, rapid and entirely automatic in operation, and is to be used for turning, shaping, and finishing small objects—such as binding-posts, bored nipples, and similar articles—such as are usually made on monitor lathes.

In the accompanying drawings, in which like letters of reference indicate like parts in all the figures, Figure 1 is a plan view of my improved automatic turning, shaping, and finishing machine, parts being broken away. Fig. 2 is an elevation, parts being broken away. Figs. 3 and 4 are vertical sectional views on the lines 3 3 and 4 4 of Fig. 1, respectively. Fig. 5 is an enlarged detail longitudinal sectional view of the automatic chuck. Fig. 6 is a front end view of the same. Fig. 7 is a rear perspective view of a part of the same.

The entire mechanism is mounted on a bed-plate A, having suitable uprights A′, in which the main shaft B is mounted to turn, said shaft carrying a belt-pulley B′ at one end. Near one end of this shaft is mounted a cam-wheel C, provided on its rim with a lateral cam projection C′, which, as shown, gradually extends from the side of the wheel and then from its highest point approaches the side of the wheel suddenly. This cam C′ acts on a roller C^2, mounted on one end of a lever C^3, pivoted at C^4 to swing horizontally. The short end of this lever C^3 bears against the end of a non-rotative spindle D, guided to move lengthwise and horizontally in standards D′ on the base-plate A, and this spindle D between the two standards D′ is surrounded by a spring D^2, which presses the spindle against the end of the lever C^3. A suitable drill or boring-tool D^3 is mounted in the opposite end of the spindle D. It is clear that when the cam-disk C rotates and acts on the lever C^3 it will cause the spindle D and its drill or boring-tool to be gradually moved in the direction toward the right, Fig. 1, and after the roller C^2 has reached the highest point of the cam projection C′ the spindle and the boring-tool will be rapidly withdrawn toward the left under the action of the spring D^2.

A carriage E is suitably mounted and guided on the base-plate A to slide transversely—that is, at right angles to the spindle D, for example—and this carriage E is connected by a pivoted link E′ with a lever E^2, extending upward and mounted to rock on a shaft E^3, held in horizontal arms E^4, projecting from the frame of the machine. The link E′ is provided with a slot E^5, in which a pivot-pin E^6 projects from the rocking lever E^2, which pivot-pin is surrounded by a box E^7, mounted adjustably in the slot E^5, and which box can be adjusted by means of a screw E^8, thus permitting of an adjustment of the effective length of the link E′. A cam-disk F is fixed on the shaft B in such a manner that its rim can act on a roller E^9 on the upper end of the rocking lever E^2, and this cam is provided on part of its circumference with two flat portions *f f′* and between them with the raised portion *g*. A chain or rope B^2 is attached to the opposite end of the carriage or slide E and passes over a pulley B^3, and to the lower end of this chain or rope a weight B^4 is attached, which weight thus serves to keep the roller E^9 of the rocking lever E^2 in contact with the rim of the cam-disk F.

The carriage E carries two uprights G G′ a short distance from each other, both lengthwise and transversely of the entire machine. A suitable stop-plate G^2 is bolted on the upright G and is provided with a projection G^3, which forms a stop for the material from which the articles are to be made—for example, a rod of metal R. This projection is so shaped that the corner *g′* formed by its bottom edge at the inner end is in exact line with the boring-tool D^3 or drill, so that when this boring-tool moves in the direction of its length toward and beyond the stop-plate G^2 the tool will contact with this corner *g′*, and thus be guided in its movements, understanding, of course, that at that time this stop-plate is in

the proper position to permit of such guiding. On the other standard G′ a combined shaping and parting tool G^4 is bolted, which tool is provided with cutting projections *h* for cutting through the rod R, rotating axially in the machine, thus severing the completed article from said rod, and which parting member *h* may have any suitable size, shape, or width, according to the shape, size, or style of the article to be made. This cutting or parting member *h* of the tool G^4, however, serves primarily for cutting off the completed article, and its function is merely that of cutting off. The shaping member h^2 of the tool G^4 is of less diameter than the part *h*, and it is so shaped and formed as to cut into the projecting end of the rotating rod of metal, R, to such an extent as to give this projection any desired shape. For example, it may cut a series of grooves and ridges, or it may give any other fanciful shape to the outer face of the rod. It will be observed that the cutting member *h* is in front of the shaping member h^2. The tool G^4 does not rotate and is so held and secured that when the carriage E is moved transversely to the length of the machine the parting or cutting member *h* will first cut a part off the projecting end of a rotating rod fed through the machine, and thereupon the shaping member *h* will act on the outer surface of this rotating rod and cut and shape the same in such a manner as may be desired—that is, according to the formation of the member h^2 of this tool. I have shown four cutting members *h* on this tool; but it is to be understood that only one or more may be provided, one only, however, being used at the time, and to use another the tool G^4 must be readjusted.

A chuck H is mounted rotatively in two suitable bearings J′ on the frame of the machine and is provided with a pulley J^2, over which a driving-belt H′ passes. The pulley J^2 can be adjusted by means of two screws J^3, which conical ends are adapted to pass to the inverted conical holes J^4 in the body J of the chuck. As is shown clearly in Fig. 5, the vertical conical holes J^4 are larger than the ends of the screws J^3—that is, the distance between the bottoms of the holes is slightly greater than the distance between the points of the screws. In case of wear or faulty adjustment one screw is loosened and the other screw tightened, whereby the pulley J^2 is moved slightly lengthwise in one direction or the other on the body of the chuck, and thus can be adjusted most minutely to compensate for any wear or lost motion. The body of the chuck J is made tubular, as shown, and is provided at one end with a head K, in the outer end of which the flaring mouth K′ is formed. The chuck proper, K^2, is provided at its inner end with a tubular screw K^3 and is provided at its outer end with a flaring head K^4, and this chuck is split lengthwise toward its inner end, so as to give its jaws spring tension, and this chuck also has a central bore K^5, through which the rod R can be fed.

The tubular screw K^3 on the inner end of the chuck K^2 is screwed into a tube L, extending lengthwise through the bore of the body J of the chuck and through a head M screwed on that end of the chuck-body J opposite the one provided with a head K. The tube L is provided at the end projecting beyond the head M with a recess for receiving the shorter end M′ of each of two L-shaped levers M^2, pivoted in the head M, and these levers M^2 are provided on the free ends of their longer arms with the beveled heads M^4. As shown, the head M is provided with longitudinal grooves M^5, in which the longer arms of the L-shaped levers M^2 can swing toward and from the body of the chuck.

A sleeve N, having a circumferential groove N′, is mounted loosely on the body of the chuck adjacent to the inner end of the head M and can be moved lengthwise of this body. The sleeve N is provided on the face adjacent to the head M with an annular recess having the beveled sides N^2, at the inner end of which the straight portion N^3 is formed. A yoke O extends into the groove N′ and projects upward from a slide O′, guided to move in the direction of the length of the machine on two horizontal rods O^2. A cam-pulley P, fixed on the shaft B, is provided with a cam-pulley P′, in which a roller-pin is located, which roller-pin is mounted on the outer end of a lever P^2, pivoted to swing horizontally, the opposite arm of said lever extending into the slide O′, so that as the cam-pulley P rotates with the shaft B the lever P^2 is rocked, and thus the sleeve N moved toward and from the head M on the chuck-body J. Between the rods O^2 a pulley Q is mounted, over which a rope or chain Q′ passes, which has one end attached to a slide Q^2, mounted on the rods O^2, and at its opposite end carries a suitable weight, (not shown,) so that by the action of this weight the slide Q^2 is moved toward the head M of the chuck-body J. The rod R, from which the articles are to be made, is inserted lengthwise through the chuck-body and the slide Q^2 is pulled back until it bears against the outer end of this rod. Under the action of the weight the slide Q^2 pushes the rod R lengthwise until it rests against the stop G^2 on the carriage E, assuming that the chuck is open. When the sleeve N is moved to the left, Fig. 5, and disengaged from the levers M^2, the chuck is open and the rod R can be moved lengtwise freely. When the sleeve N, Fig. 5, is moved to the right, the bevel N^2, acting on the heads M^4 of the levers M^2, presses these heads toward the longitudinal axis of the chuck-body, whereby the shorter rear ends of these levers M^2 are moved toward the right, Fig. 5, and pull the tube L and

chuck K^2 in the same direction. The flaring mouth K′ of the chuck-body, acting on the beveled head K^4 of the chuck K^2, presses the jaws of the chuck together and firmly against the rod R, which is thus held securely and remains so held until the ring N is again moved away from the head M on the chuck-body. Attention should be called to the fact that when the chuck is open—that is, when the ring N is moved away from the head M and the chuck-body is rotated—the L-shaped levers M^2 have a tendency to swing outward under the action of centrifugal force, and thus assist in moving the tube L and chuck K^2 lengthwise toward the front end of the chuck-body, so as to assist in opening the chuck, and likewise when the chuck is open the centrifugal force throws out chips that may have passed into the slots in the chuck, and thus keeps the chuck clean. When the chuck is closed, the entire pressure exerted for keeping it closed is taken up by the sides of the flaring mouth K′ of the chuck-body and need not be taken up by pivot-pins or other parts, thus making the chuck extremely strong, simple, and durable.

The operation of the machine is as follows: When the chuck is open, the rod R is fed forward lengthwise until its front end rests against the stop G^2, whereupon the chuck is closed by the action of the cam-wheel P on the lever P^2 and the action of the latter by means of the mechanism described on the sleeve N. As soon as the chuck is closed, the cam-wheel C acts on the lever C^3, causing the boring-tool D^3 to be gradually forced lengthwise into the free end of the rod R, resting against the stop G^2, and after the hole has been bored to the desired depth the boring-tool is automatically withdrawn, as has already been explained. By that time the cam-disk F acts in such a manner as to move the carriage E transversely to the length of the machine or, as illustrated in Fig. 1, from top to bottom. Thereby the stop-plate G^2 is moved out of the line of the axis of the boring-tool and of the rod R, and at the same time the parting or cutting member h of the combined parting and shaping tool G^4 is brought in contact with the surface of the rod and gradually moved across the rod so as to sever a length of the rod equal to the distance between the adjacent planes of the cutting member h and the stop-plate G^2. The cam F continues to move the carriage E in this direction until the shaping member h^2 of the combined parting and shaping tool G^4 has acted on the circumferential surface of part of the projecting end of the rod R so as to shape this projecting part according to the configuration of the member h^2. Thereupon the weight B^4 moves the slide E in the reverse direction, so as to remove the shaping member h^2 and the cutting or parting member h' away from and out of the path of the rod R, at the same time bringing the stop G^2 into the path of the rod R, and when this stop-plate has arrived in its proper position the cam-pulley P causes the opening of the chuck, permitting the rod R to be fed forward until it strikes the stop G^2, whereupon the chuck is again automatically closed, the rod bored lengthwise, and then that part of the end of the rod which has been previously shaped on its circumferential surface by the member h^2 of the tool G^4 is cut off by the member h of the tool G^4, and the circumferential surface of the now new end part of the rod is shaped as previously described. The tool G^4 is withdrawn, the stop brought in place, the chuck opened, the rod fed forward and then gripped, and so on.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic turning-machine, the combination with a rotative chuck and means for automatically opening and closing the same, of a non-rotative drill in line with said chuck, a carriage mounted to move transversely to the axis of the chuck and drill, a stop fixed on said carriage and having a recess in line with the axis of the drill, a combined parting and shaping tool on said carriage located some distance from the stop in the direction of the movement of the carriage, the stop being also located a greater distance from the chuck than is the combined parting and shaping tool, substantially as set forth.

2. In an automatic turning-machine, the combination with a tubular rotative clutch-body, of a longitudinally-movable clutch therein, a belt-pulley surrounding the clutch-body, two screws in said pulley at opposite ends thereof, the inner ends of which screws are made conical, the clutch-body having two inverted conical holes for receiving the conical ends of said screws, the distance between the points of the screws being less than the distance between the lowest parts of the inverted conical holes in the clutch-body, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 10th day of July, 1905.

ALBERT R. WEISZ.

Witnesses:
OSCAR F. GUNZ,
SOPHIE M. BARDIE.