No. 746,408. PATENTED DEC. 8, 1903.

E. D. TUCKER.

PLATE FINISHING MACHINE.

APPLICATION FILED DEC. 17, 1900.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

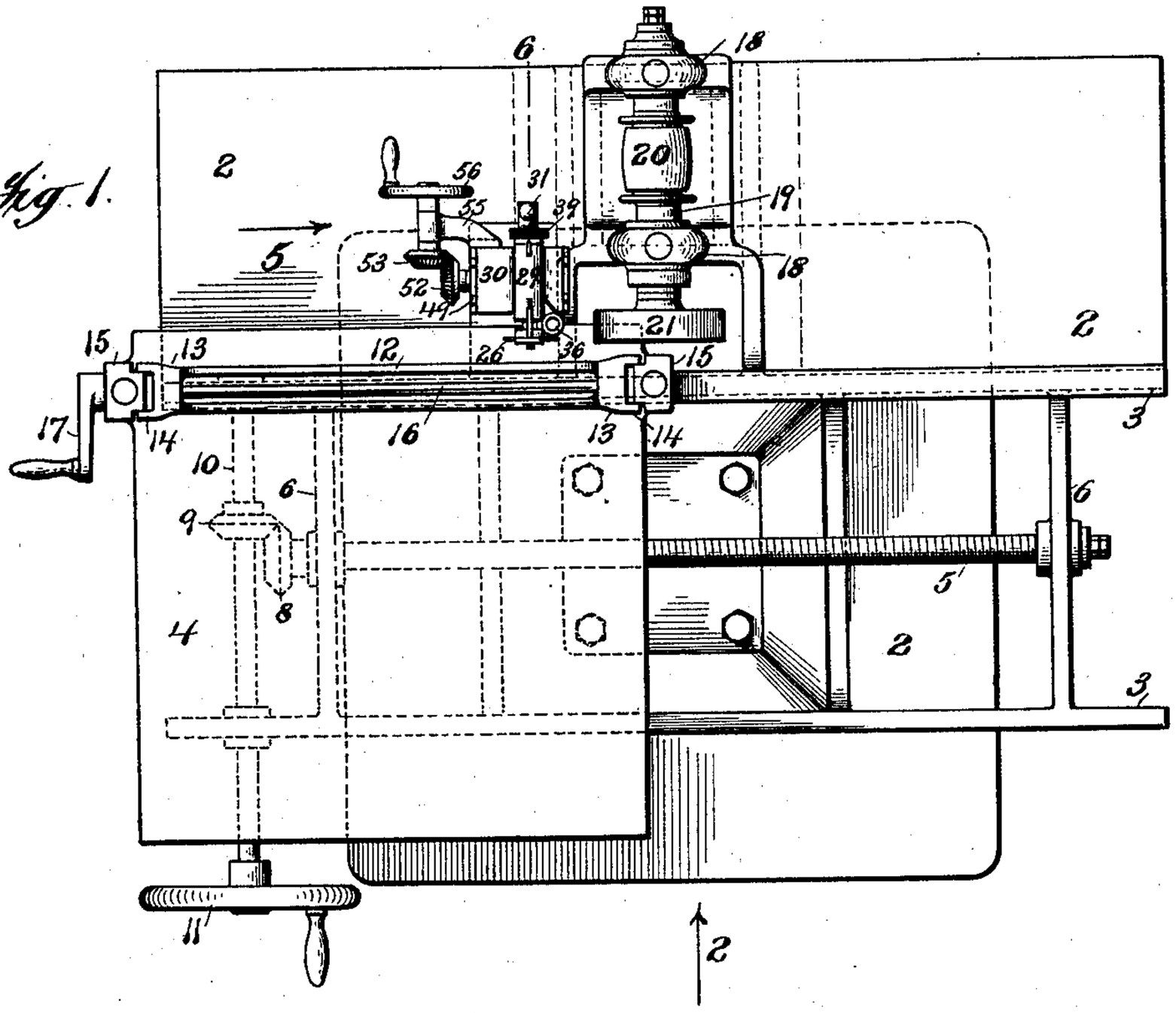
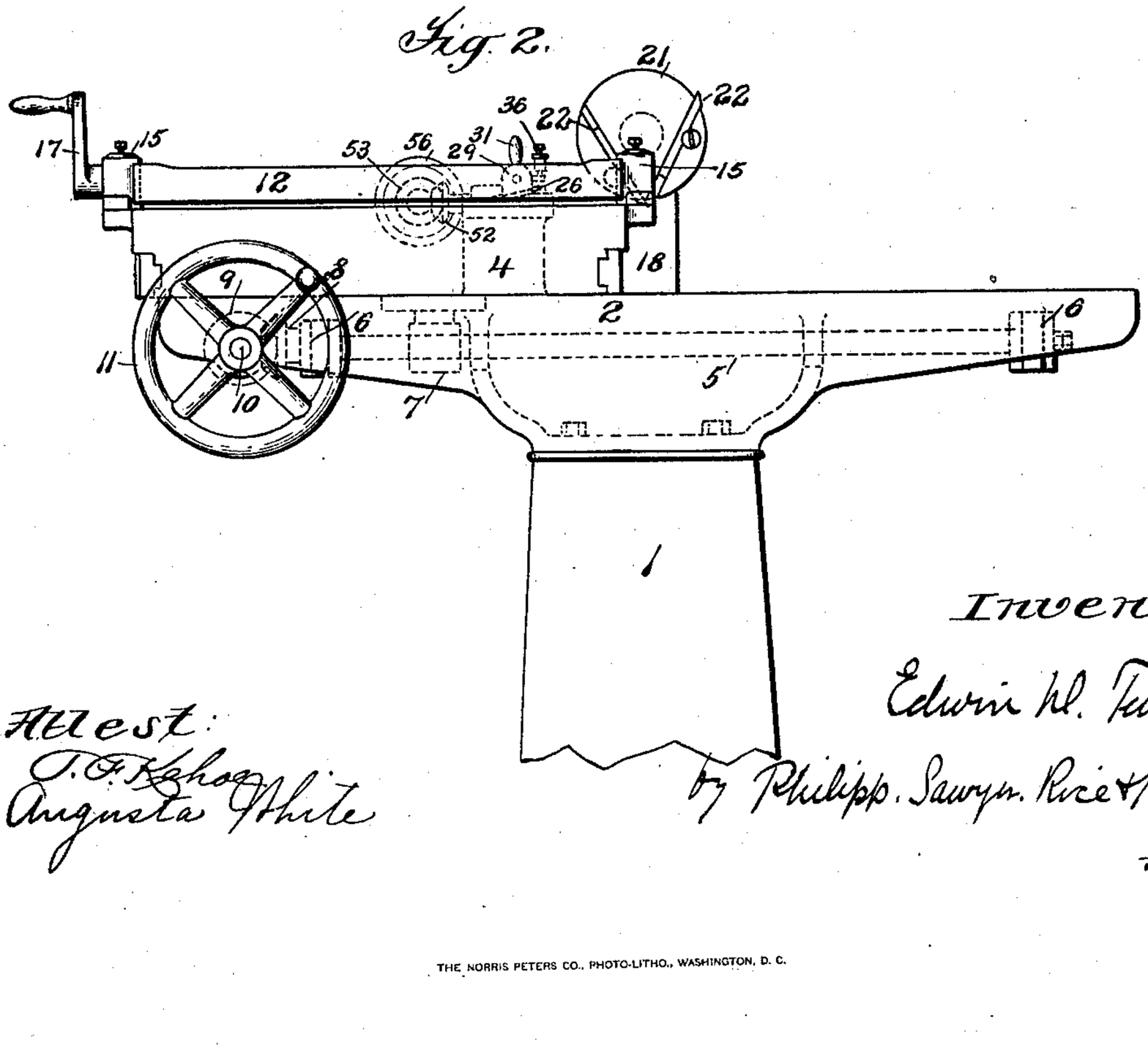


Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 2.

Fig 3.

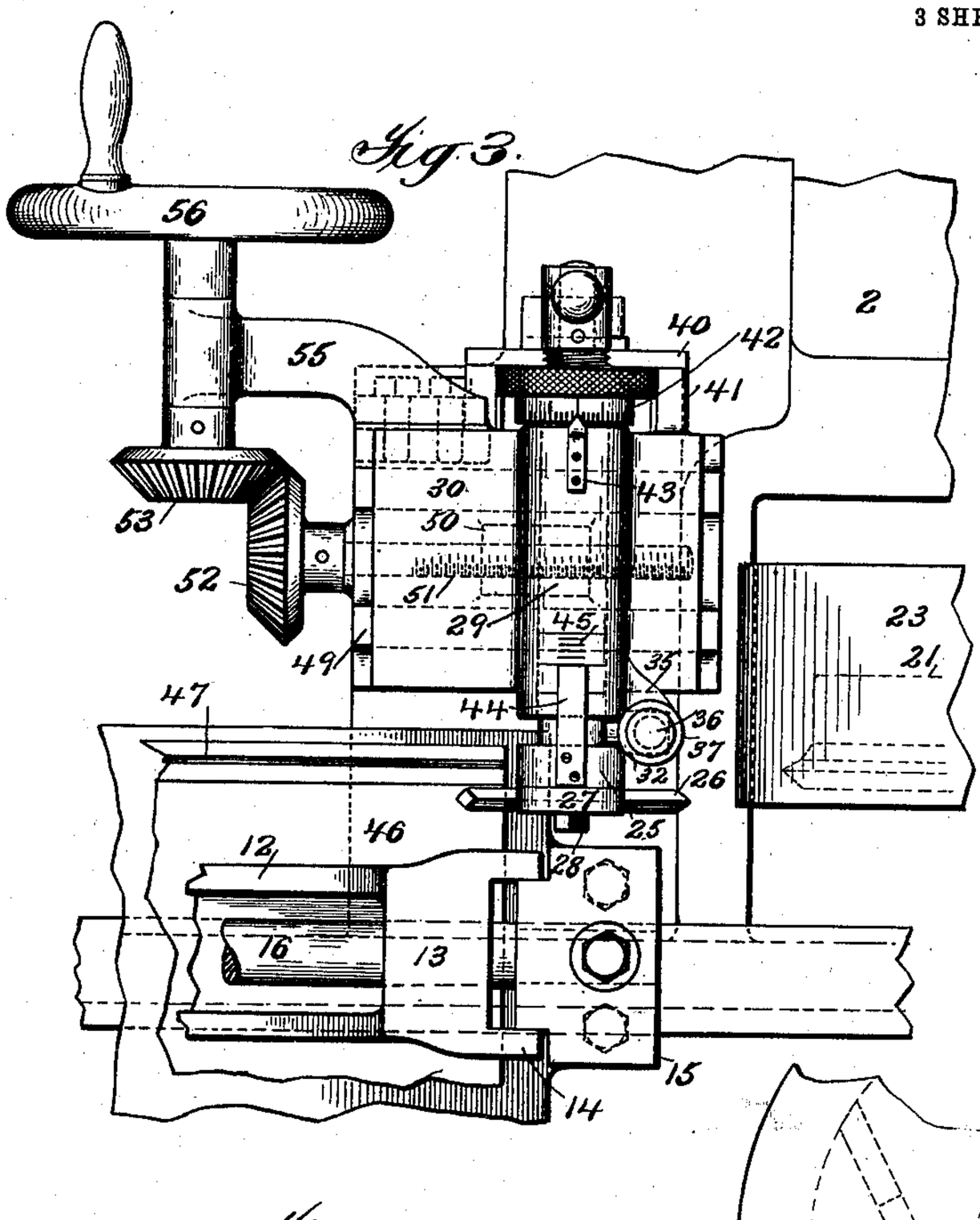
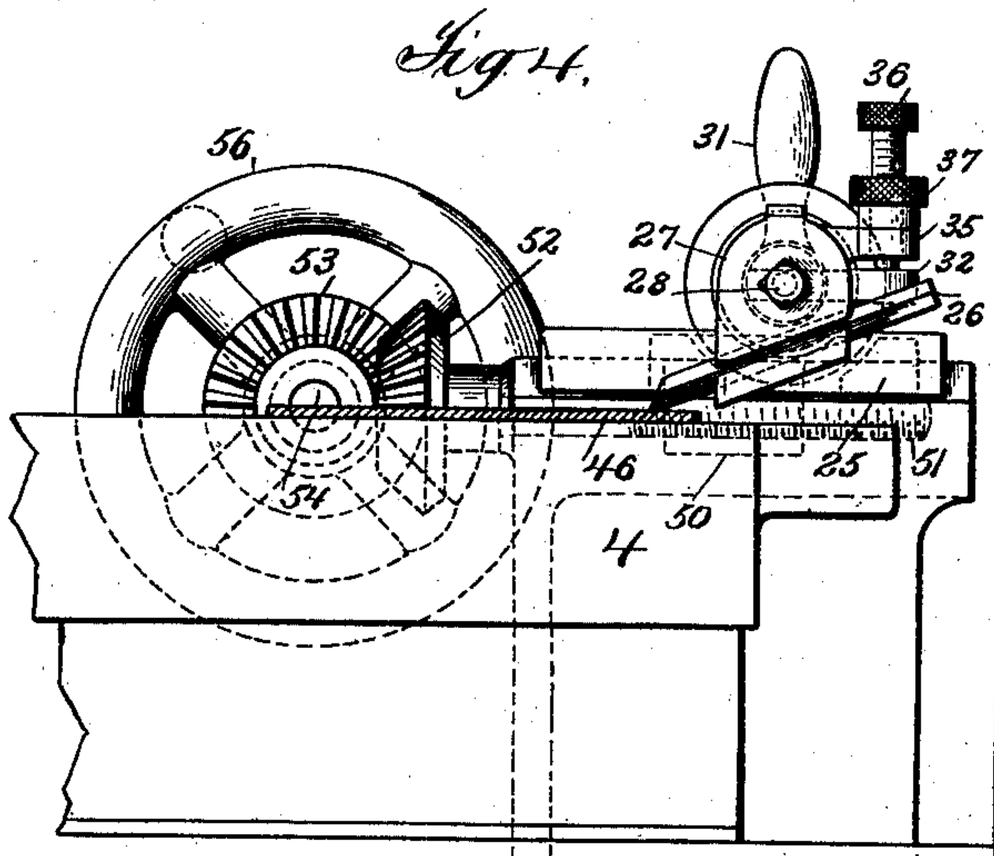


Fig 4.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 5.

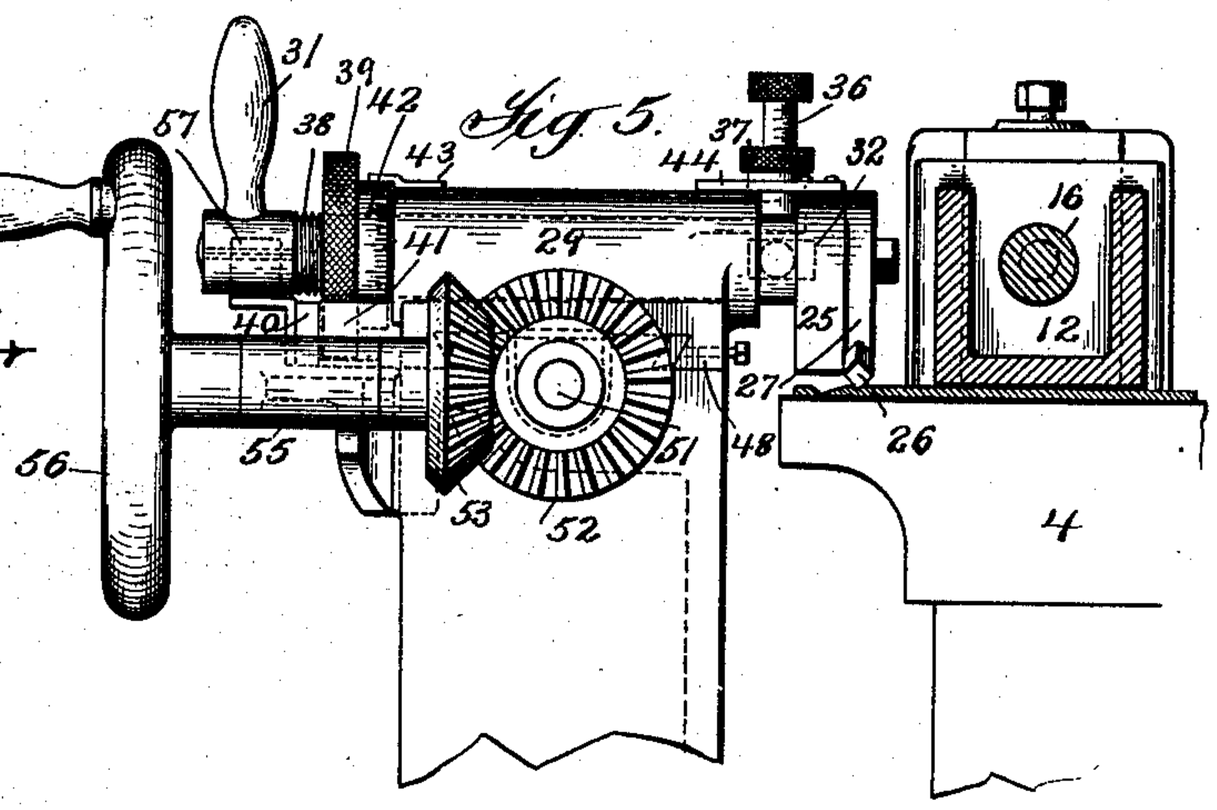


Fig. 6.

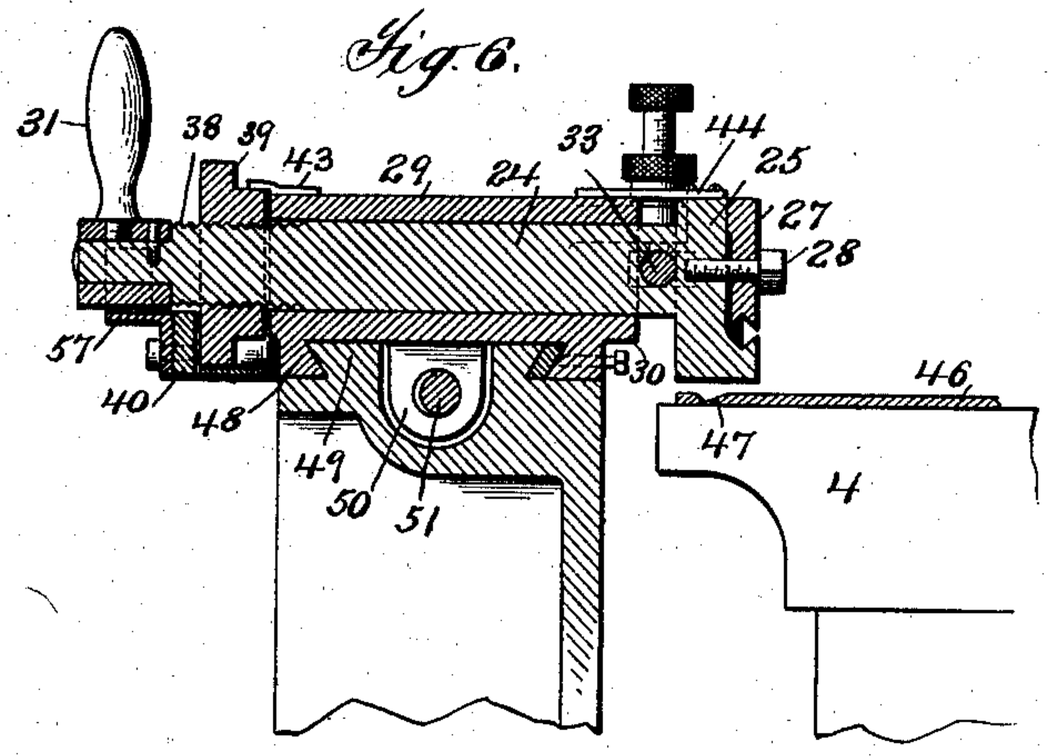
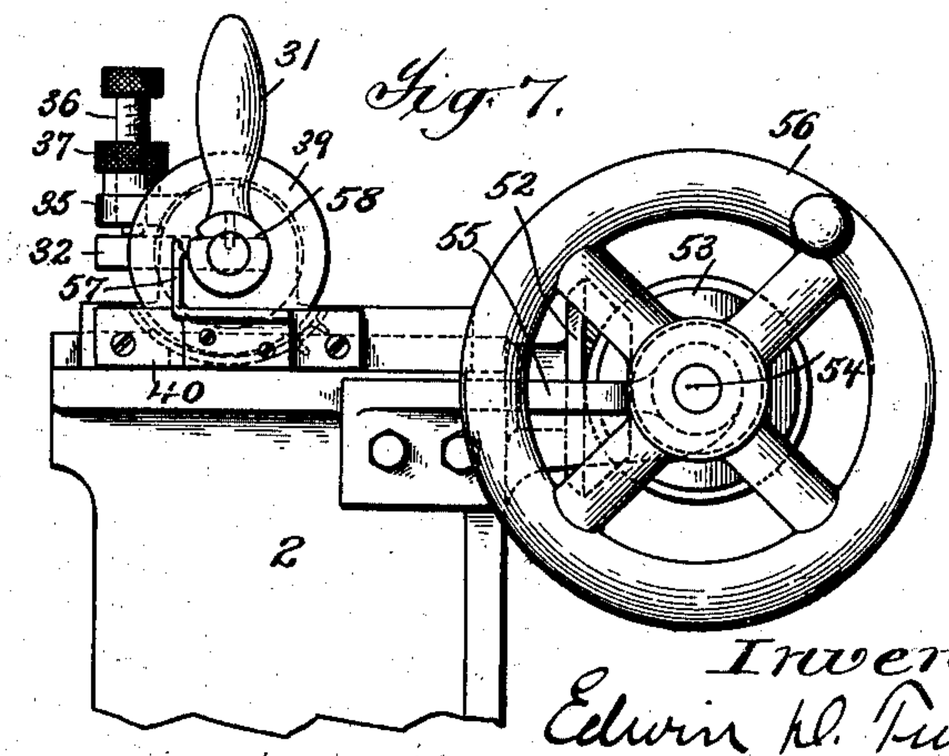


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWIN D. TUCKER, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF NEW YORK, N. Y.

PLATE-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 746,408, dated December 8, 1903.

Application filed December 17, 1900. Serial No. 40,120. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. TUCKER, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Plate-Finishing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in plate-finishing machines.

In preparing printing-plates, and more particularly half-tone plates, for use it is customary before finally proving the plate to subject it to the action of a cutting mechanism commonly called a "beveling-cutter," which produces a deep-beveled cut around the plate, said cut determining the final size of the plate. This cut is not, however, made deep enough so as to entirely cut through the plate, the material outside the cut being left on the plate until after the plate is proved, so as to prevent the shoulder of the plate from being crushed by the heavy pressure to which it is subjected in proving.

It is frequently desirable to prepare a plate of the character referred to so that the picture will have a border which contains one or more white lines. This is accomplished by cutting one or more lines between the shoulder of the plate left by the beveling cut and the edge of the picture. These lines are usually produced by a hand operation, the plate being gone over by an operator, who cuts the required lines with a graver.

It is the object of this invention to produce an improved plate-finishing machine which will embody a beveling-cutter and a line-cutter.

A further object of the invention is to produce a line-cutter of improved construction.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a plan view of the improved plate-finishing machine. Fig. 2 is a side view of the construction shown in Fig. 1, the view being taken in the direction of the arrow 2 in said figure. Fig. 3 is an enlarged plan view of the line-cutting mechanism. Fig. 4 is a side elevation of the construction shown in Fig. 3, the work-clamp being removed and the plate being shown in section. Fig. 5 is a detail view illustrating the construction of the line-cutting mechanism, the direction of view being indicated by the arrow 5 in Fig. 1. Fig. 6 is a sectional elevation on the line 6 of Fig. 1. Fig. 7 is a detail elevation, the direction of view being indicated by the arrow 7 in Fig. 5.

Referring to the drawings, which illustrate one embodiment of the invention, the frame, which may be of any desired form or construction, consists of a pedestal or standard 1, to which is secured a platform 2. The work-support will preferably be a reciprocating one. To this end, therefore, the platform or table 2 is provided with ways 3, on which is mounted a work-support 4. Any suitable means may be employed for driving the work-support. As shown, however, a screw-rod 5 is suitably supported in the machine, the supports in the present instance being cross-bars 6, which are located between the ways 3. This screw-rod 5 is engaged by a nut 7, which is secured to the under side of the table 4, and the rod is further provided with a bevel gear-wheel 8, (indicated in dotted lines in Fig. 1,) which is engaged by a similar gear 9, mounted on a shaft 10, suitably supported in the machine, said shaft being provided with a hand-wheel 11 or other suitable means for rotating it.

Any suitable means may be employed for clamping the plate to the work-support. In the construction shown the clamp consists of a U-shaped bar 12, having blocks 13, one at each end. These blocks are provided with projections 14, which engage ways on blocks 15, suitably secured to the support 4. A shaft 16, having a handle 17 or other suitable operating means, is journaled in the blocks 15 and is provided with eccentrics which engage the blocks 13, and thus move the bar 12 vertically to clamp or release the plate. The clamp described is of a well-known form, and

any other suitable clamp may be substituted for it, if desired.

The beveling-cutter may be of any suitable description. In the construction shown the platform 2 is provided with suitable bearings 18, in which is journaled a shaft 19, provided with a driving-pulley 20. This shaft carries a cutter-head 21, to which are secured cutters 22. (See dotted lines in Fig. 4.) The cutter is or may be surrounded by a suitable chip-guard 23. (Shown in Figs. 3 and 4.)

The line-cutter may be varied in its details of construction. In the construction shown, however, a suitable carrying-spindle 24 is provided, having on one of its ends a cutter-head 25, the cutter 26 being secured to said head by means of a clamp 27 and a screw 28 or in any other suitable manner. The carrying-spindle 24 is mounted in a bearing 29, rising from a plate 30. The cutter is thrown into and out of operative position by rotating the spindle 24. This may be accomplished in any suitable manner; but the spindle will preferably be provided with a handle 31, secured thereto in any suitable manner.

Suitable means are provided to vary the amount of cut of the line-cutter, this being necessary in order to produce lines of different widths. Suitable means may be employed for giving the line-cutter the adjustment referred to. The cutter 26, as shown, is polygonal in cross-section, and the width of the cut will therefore depend upon its depth. In order to regulate the depth of the cut produced by the cutter 26, suitable devices are employed, which may vary widely in construction. As shown, the spindle 24 is provided with a projection 32, (see Fig. 4,) which is secured to the spindle in any suitable manner, as by having its stem 33 engage a perforation therein. The bearing 29 is similarly provided with a projection 35, in which is tapped a screw 36, which acts in connection with the projection 32 as an adjustable stop. A lock-nut 37 is or may be provided to hold the screw 36 in adjusted position. Suitable means are also provided for varying the position of the cutter, so as to determine the position of the line cut thereby. While these means may also vary widely in construction, as shown, the spindle 24 is provided near the end which carries the handle 31 with screw-threads 38, which are engaged by a knurled nut 39. The nut 39 is held stationary with respect to the bearing 29 by means of a cross-bar 40, which is secured to projections 41, extending from the plate 30, which carries the bearing 29.

In order to measure and determine the amount of longitudinal adjustment which will be given the spindle by the nut 39, the hub of the nut is preferably provided with scale-marks 42, which operate in conjunction with an indicator 43, secured to the bearing 29. A second indicator 44 is secured to the cutter-head, said indicator coöperating with scale-marks 45, formed on the top of the bearing 29. The two scales are so proportioned that one complete rotation of the adjusting-nut 39 will move the spindle one division of the scale 45.

The work-support 4 is shown in Figs. 4, 5, and 6 as carrying a plate 46, which has had a beveled groove 47 cut therein by the bevel-cutters 22. With the mechanism so far described it is obvious that after the beveling-cutter has operated the line-cutter may be thrown into operation and as the work-support moves will operate to cut a line therein which varies in width and position according to the adjustment of the cutter. It has been found difficult, however, with a screw-feed such as the work-support is driven by to operate the mechanism, so as to bring the line-cutter to a stop at the precise point desired, and it will be readily understood that inasmuch as the lines cut by the line-cutter surround the picture any failure to bring the line-cutter to a stop at the proper point will cause the line being cut thereby to cross or fall short of the line to which it should be joined. While the line-cutter is generally stationary and the work-support moves, it is desirable to so construct the line-cutters as to give it movement to start and finish the cut. While the means by which the line-cutter is given the movement referred to may be varied widely, in the construction shown the table 30 is provided with depending beveled ways 48, which engage similar ways 49 on the bracket which supports the table 30. The table 30 is also provided with a nut 50, which engages a fine threaded screw 51, mounted in a suitable support in the bracket before referred to. The screw 51 may be driven in any suitable manner, but is preferably provided with a beveled gear 52, engaged by a similar gear 53, mounted on a shaft 54, which is supported in a bracket 55 and is driven by a hand-wheel 56 or in any other suitable manner.

While the line-cutter and the beveling-cutter might be in operation simultaneously, it will usually be found desirable to subject the plate first to the action of the beveling-cutter and then to the action of the line-cutter. Means are therefore preferably provided to hold the line-cutter out of operation while the beveling-cutter is acting. In the construction shown these means consist of a spring-catch 57, which is provided with a projection arranged to engage a nut 58 on the hub of the handle 31 when the handle is turned, so as to throw the cutter out of its operative position.

The operation of the machine will be readily understood from the preceding description.

While the construction which has been described embodies a preferred form of the invention, it is to be understood that the invention is not to be limited to the details thereof.

What is claimed is—

1. The combination with a line-cutter, of a reciprocating work-support, and means for

giving the cutter a movement in the direction of the line of cut in order to finish the cut, substantially as described.

2. The combination with a reciprocating table, of a line-cutter, means for giving the cutter adjustments to vary the amount and position of the cut, and means for giving the cutter a movement in the direction of the line of cut to finish the cut, substantially as described.

3. The combination with a work-support, of a mechanism for driving it, a line-cutter, suitable bearings in which the cutter is supported, and a screw mechanism for giving the cutter in its bearings a movement in the direction of the line of cut, substantially as described.

4. In a plate-finishing machine, the combination with a beveling-cutter, of a line-cutter, suitable bearings in which said line-cutter is supported, a work-support common to both cutters, a mechanism for reciprocating the work-support past both cutters, and a screw mechanism for giving the line-cutter a movement in the direction of the line of cut, substantially as described.

5. The combination with a line-cutter-supporting spindle, of suitable bearings therefor, means for giving the spindle a rotary movement to throw the cutter into and out of cutting position, means for limiting the amount of said rotary movement and thus determining the amount of the cut, means for giving the spindle a lengthwise movement to determine the position of the cut, a scale mechanism for determining the amount of said movement, a screw mechanism for giving the spindle in its bearings a movement in the direction of the line of cut, a work-support, and means for reciprocating the support, substantially as described.

6. In a plate-finishing machine, the combination with a beveling-cutter, of a line-cutter, a spindle on which said cutter is supported, suitable bearings for the spindle, means for rotating the spindle to throw the line-cutter into cutting position, an adjustable stop for limiting the rotary movement of the spindle and thus determining the amount of cut, means for giving the spindle a lengthwise adjustment to determine the position of the cut, a screw mechanism for giving the spindle in its bearings a movement in the direction of the line of cut, a scale mechanism for determining the amount of the lengthwise adjustment, a work-table common to both cutters, and means for reciprocating the table, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDWIN D. TUCKER.

Witnesses:
F. W. H. CRANE,
L. ROEHM.