No. 840,765. PATENTED JAN. 8, 1907.

S. G. GOSS.

ROUTING MACHINE.

APPLICATION FILED AUG. 4, 1903.

4 SHEETS—SHEET 1.

Fig. 1.

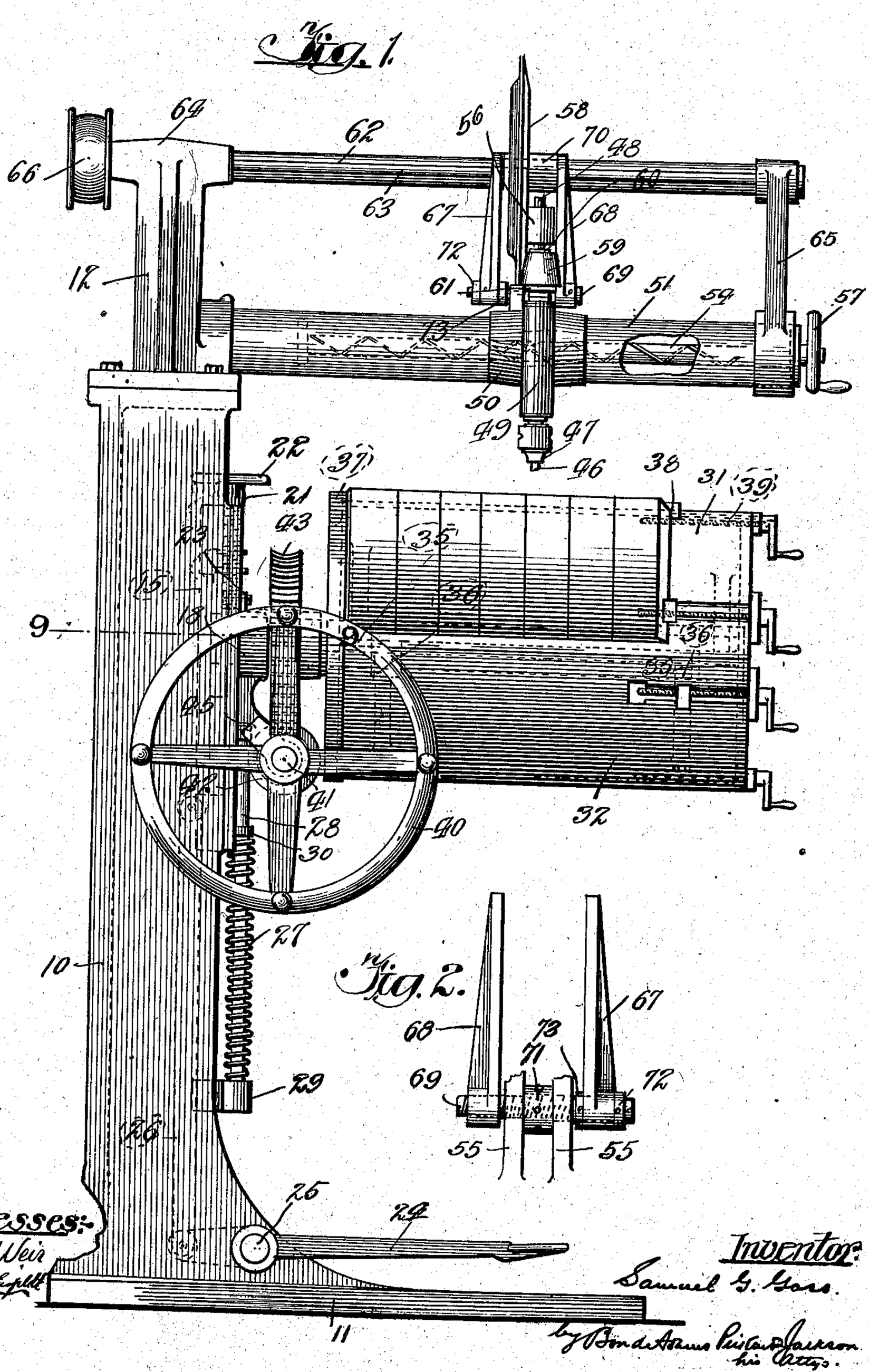

Fig. 2.

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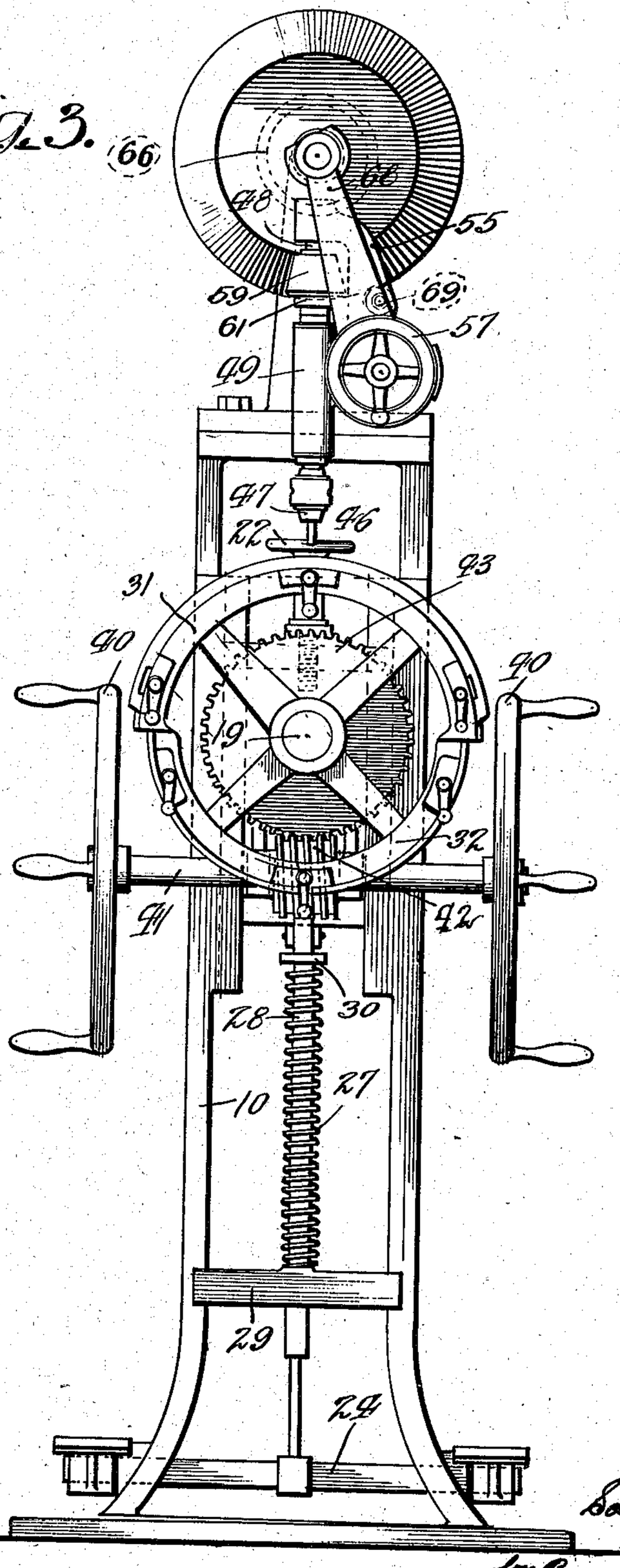
4 SHEETS—SHEET 2.

Fig. 3.



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4 SHEETS—SHEET 3.

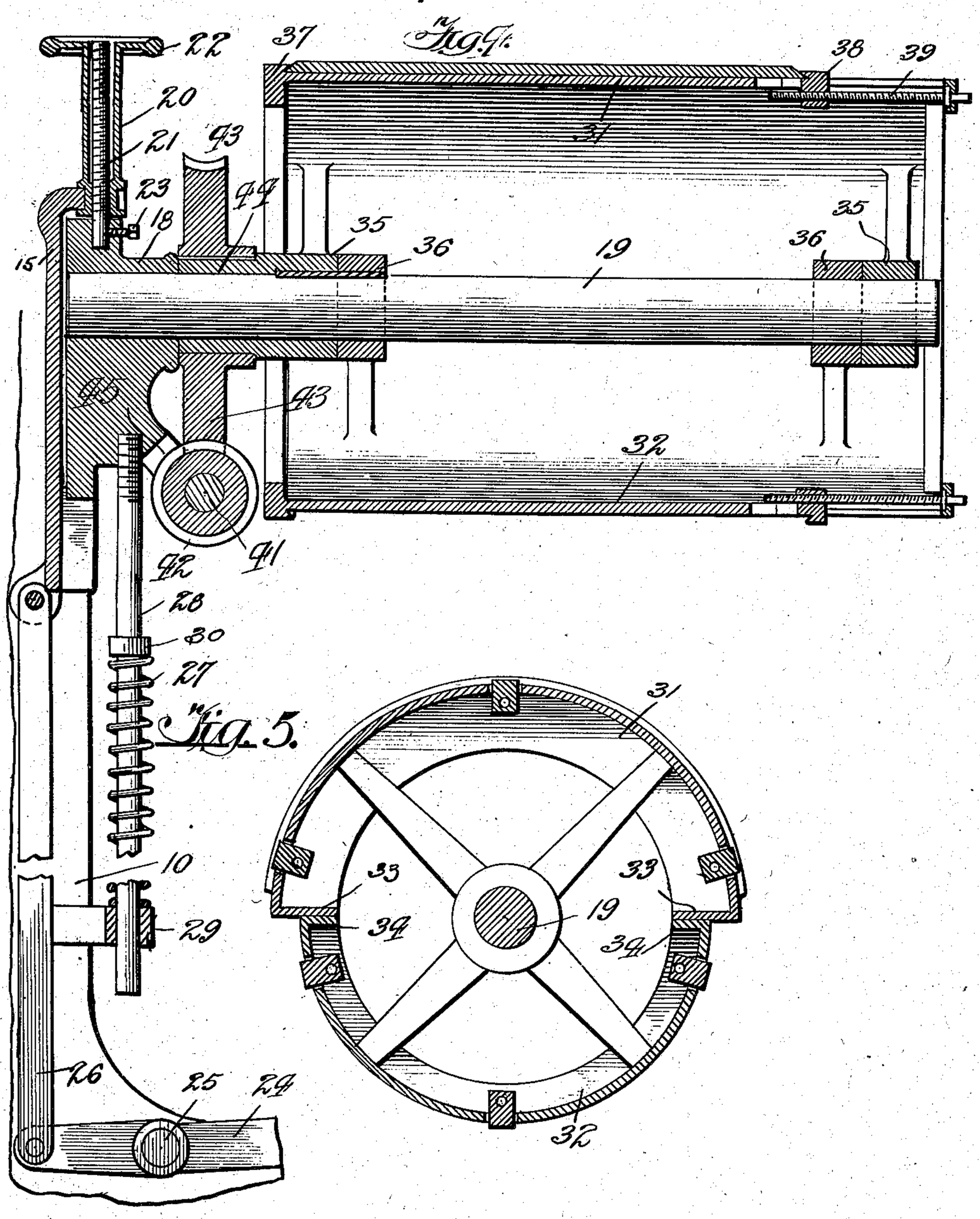

Fig. 4.

Fig. 5.

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4 SHEETS—SHEET 4.

Fig. 6

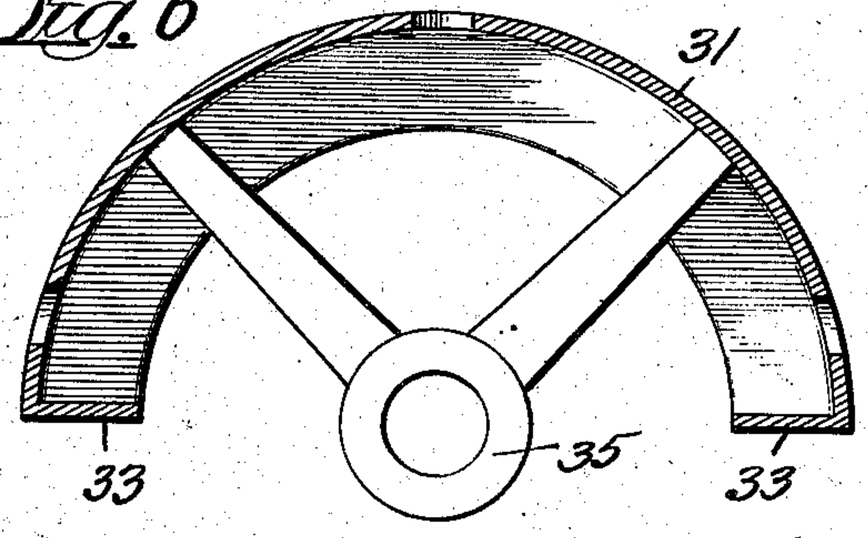
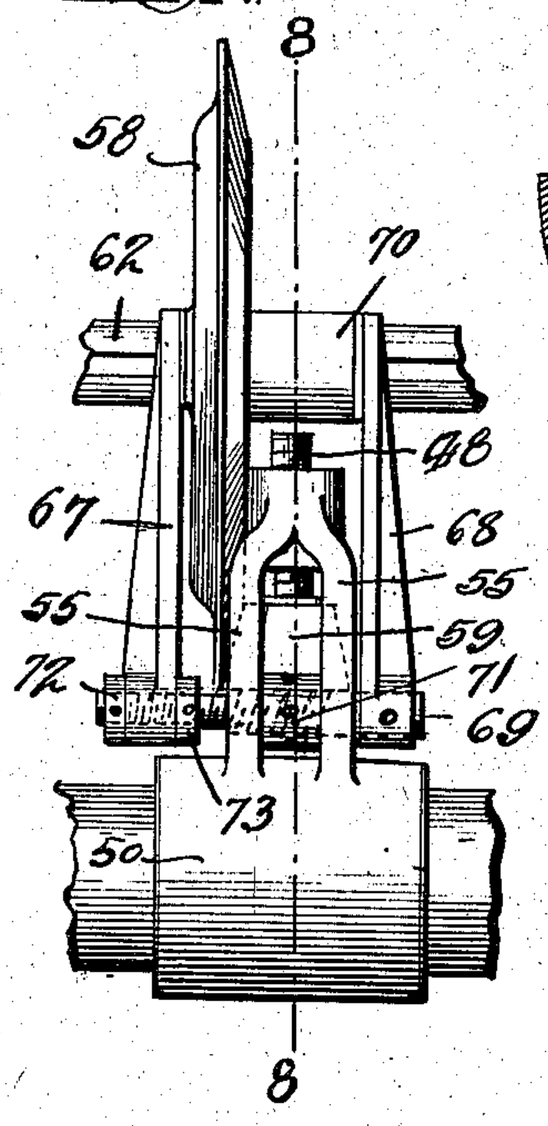


Fig. 7



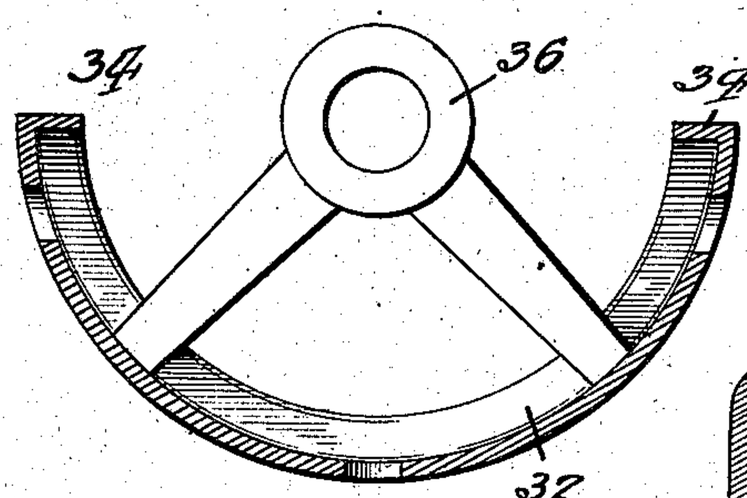
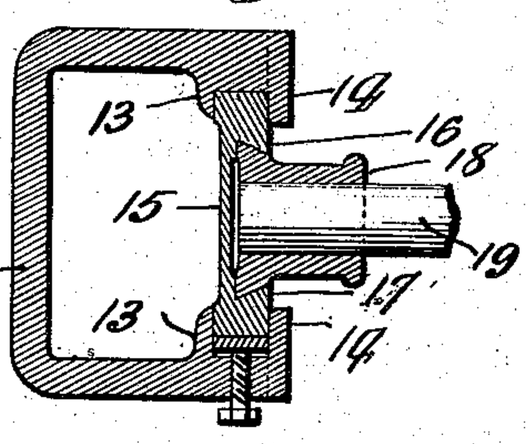
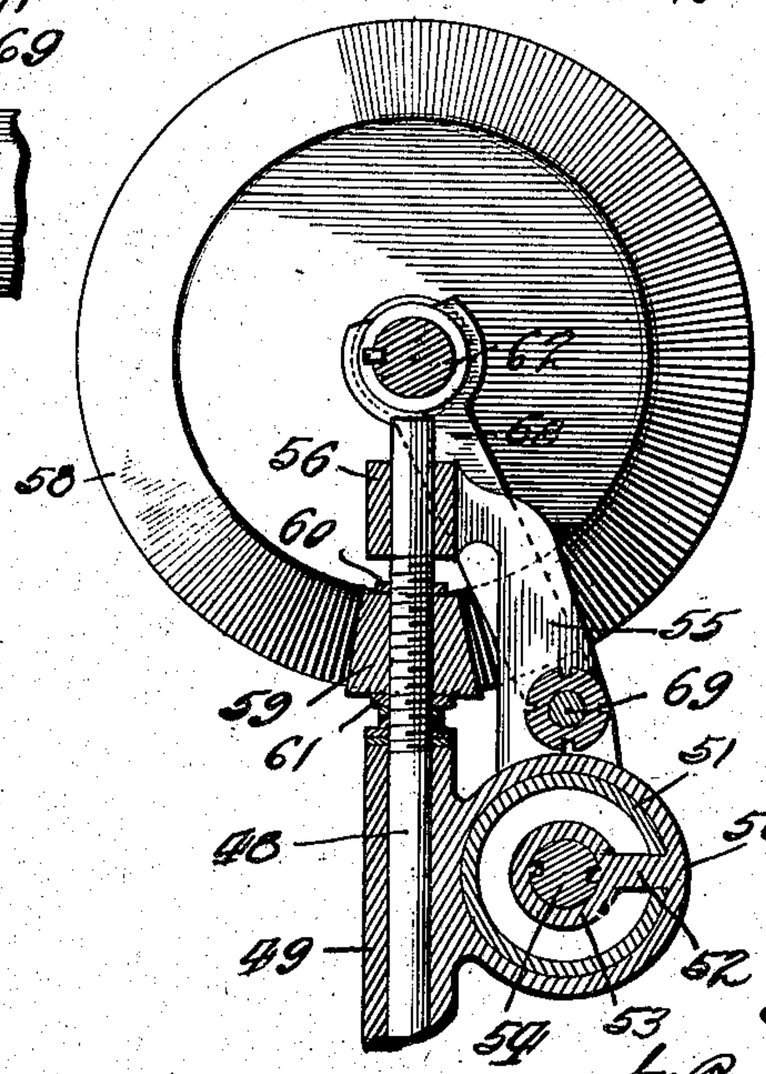


Fig. 8.

Fig. 9





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UNITED STATES PATENT OFFICE.

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ROUTING-MACHINE.

No. 840,765. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed August 4, 1903. Serial No. 168,236.

To all whom it may concern:

Be it known that I, SAMUEL G. GOSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Routing-Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to machines for cutting out such parts of stereotype or other plates as are not intended to print, which operation is commonly called "routing," and has for its object to provide a new and improved machine for operating on curved stereotype-plates, and particularly one which will be adapted for use in connection with plates intended for printing-cylinders of different diameters. I accomplish this object as hereinafter described and as illustrated in the accompanying drawings.

That which I regard as new will be set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine, certain parts being broken away. Fig. 2 is an enlarged detail of part of the mechanism by which the routing-tool is adjusted longitudinally of the plate. Fig. 3 is an end view of the machine. Fig. 4 is an enlarged detail, being a partial longitudinal vertical section. Fig. 5 is a cross-section of the rotary stereotype-plate support. Fig. 6 is a cross-section illustrating the members of the plate-support disassembled. Fig. 7 is an enlarged detail, being an elevation of a part of the mechanism for adjusting the routing-tool-driving devices longitudinally of the plate-support. Fig. 8 is a vertical cross-section on line 8 8 of Fig. 7, and Fig. 9 is a partial horizontal section on line 9 9 of Fig. 1.

My improved routing-machine comprises in general a rotary support for a semicylindrical printing plate or plates, which may be produced by stereotyping or otherwise, said support being rotatably supported, so that it may be wholly or partially rotated about a substantially horizontal axis. Said support is provided with suitable clamps, preferably those commonly employed on printing-press cylinders for securing the stereotype-plates thereupon. The plate-support is rotated by means of a hand-wheel, the latter being mounted upon a shaft which carries the plate-support.

In order to accommodate plates adapted to fit cylinders of different diameters instead of making the plate-support truly cylindrical, said support is composed of a plurality of members, each of which is partly cylindrical, and said members are of such diameters as will accommodate the plates to be operated upon. Where two members only are provided, they are best made semicylindrical, the two sections or members being held together by mounting them upon a common shaft. The routing-tool is preferably arranged above the plate-support on a suitable frame which extends longitudinally of said plate-support and is provided with means for causing the routing-tool to travel longitudinally thereof and also for causing it to rotate rapidly. Suitable mechanism is also provided for adjusting the mechanism for rotating the routing-tool, so as to take up wear and secure the maximum of efficiency.

When the parts are in their normal position, the plate-support is a sufficient distance away from the point of the routing-tool so that the plates carried by said support are not engaged thereby. In order to operate the machine, the plate-support is caused to move toward the routing-tool, this being effected, preferably, by means of a foot-lever connected with a slide or movable support, in which is secured the shaft on which the plate-support is mounted. A suitable standard is provided for carrying the different operating parts.

Having thus stated generally the leading characteristics of my improved machine, I will now describe in detail the specific embodiment of my invention illustrated in the accompanying drawings.

Referring to the drawings, 10 indicates the standard of the machine, which is provided with an extended base 11 of sufficient size to provide a firm foundation.

12 indicates an auxiliary standard mounted upon the upper end of the standard 10.

As best shown in Fig. 9, the standard 10 is hollow and is open at one side, where it is provided with flanges 13 14 at the opposite sides of the opening, forming guides for a slide 15, which is adapted to move vertically on the standard. Said slide on its outer face is provided with beveled flanges 16 17, which also form guides for a block 18, which fits

thereupon and is vertically adjustable on the slide 15. The block 18 carries the shaft 19, upon which the plate-support is mounted. The block 18 is vertically adjusted by means of a screw-threaded sleeve 20, which engages a screw 21, secured to and projecting from the upper end of the block 18, as shown in Fig. 4. The sleeve 20 is fitted in a suitable bearing in the upper portion of the slide 15, as shown in Fig. 4, and is provided with a hand-wheel 22 for convenience in rotating it.

23 indicates a set-screw by which the screw 21 is secured to the block 18.

24 indicates a foot-lever mounted on a pivot 25 at the lower portion of the standard 10, said lever being connected by a connecting-bar 26 with the lower portion of the slide 15, as shown in Fig. 4. By operating the lever 24 the slide 15 may accordingly be adjusted vertically. Obviously, when the slide 15 is adjusted vertically the block 18 is also similarly adjusted; but a further adjustment of the block 18 may also be secured by means of the sleeve 20, the latter being employed where fine adjustment is desired.

To cushion or partly balance the block 18 when it is depressed suddenly, I provide a spring 27, mounted on a rod 28, which depends from the block 18 and passes through a guide 29, secured to the standard 10, as shown in Fig. 4. The spring 27 lies between the guide 29 at its lower end and a collar 30 at its upper end, the whole being secured to the rod 28, so that when the block 18 descends the spring 27 is compressed.

31 32 indicate the sections or members of the plate-support. As shown in Fig. 5, the section 31 is of considerably greater diameter than the section 32; but they are fitted together and secured upon the same shaft 19, as shown. In order to adapt them to fit closely together, the section 31 is provided with inwardly-extending flanges 33, and the section 32 is provided with similar flanges 34, said flanges being adapted to abut against each other, as shown in Fig. 5. Said members are provided, respectively, near their ends with hubs 35 36, which fit upon the shaft 19 and secure said members in place. By this construction it will be seen that plates of different diameters may be secured upon the plate-support at the same time and the machine used for routing such plates without change, since by reason of the fact that the plate-support is adjusted toward and from the routing-tool the fact that the plates are of different diameters does not interfere with the proper operation of the machine.

In order to accommodate plates of different lengths, I provide the plate-supporting members with adjustable clamping devices, as shown in Figs. 1 and 4, said clamping devices consisting of beveled flanges 37, placed at one end of each of said members, and adjustable clamping-blocks 38, provided at the other end of said supporting members, said blocks being movable in longitudinal slots and being supported on clamping-screws 39, as shown in Fig. 4. The specific construction of said clamping devices is not herein claimed, as it forms no part of my present invention, but constitutes the subject-matter of my pending application, Serial No.78,447, filed October 12, 1902.

The plate-supporting members are rotated by means of one or more, preferably two, hand-wheels 40, mounted upon a shaft 41, carrying a worm 42, which engages a worm-wheel 43, mounted on the shaft 19. The worm-wheel 43 is not mounted directly on the shaft 19, but is mounted upon and keyed to an extension 44 of the hub 35. By this construction the plate-supporting members may be rotated without rotating the shaft 19. The shaft 41 is supported in suitable bearings 45, carried by the block 18, so that the mechanism for rotating the plate-supporting members moves vertically with said block, the object of which arrangement has been already described.

46 indicates the routing-tool, which, as best shown in Figs. 1 and 3, is secured in a suitable holder 47, carried at the lower end of a shaft 48, mounted in a suitable bearing-block 49, which is carried by a traveling sleeve 50, as shown in Fig. 8. The sleeve 50 is mounted upon an inner stationary sleeve 51, which is provided at one side with a longitudinal slot, through which passes a web 52, which carries at its inner end a third sleeve 53, which fits closely upon a screw-threaded shaft 54, as shown in Fig. 8. The sleeve 53 is internally screw-threaded to fit the shaft 54, and consequently by rotating said shaft the outer sleeve 50 is caused to travel longitudinally upon the inner or stationary sleeve 51. As shown in Fig. 1, the stationary sleeve 51 is supported at one end in the auxiliary standard 12 and extends horizontally over and longitudinally of the plate-support. The parts are so adjusted that the routing-tool 46 lies substantially in the same vertical plane as the center of the shaft 19. Consequently the shaft 54 lies at one side thereof, as shown in Fig. 8.

55 indicates arms which rise from the sleeve 50 and carry at their upper ends a bearing-block 56, through which passes the upper end of the shaft 48, thereby providing a firm support for said shaft.

57 indicates a hand-wheel mounted upon the outer end of the screw-threaded shaft 54, as shown in Fig. 1, for rotating said shaft to adjust the sleeve 50 and the routing-tool longitudinally of the plate-support.

The routing-tool is rotated by means of friction drive mechanism, comprising a beveled disk 58, which frictionally engages a beveled pinion 59, mounted on the upper portion of the shaft 48, as shown in Fig. 8. In order

that the beveled pinion 59 may be adjusted vertically, the shaft 48 is screw-threaded, the pinion 59 being correspondingly screw-threaded, and the whole is held in place by lock-nuts 60 61, as shown in Fig. 8. The object of adjusting the pinion 59 vertically is to take up wear or to vary the pressure of said pinion upon the wheel or disk 58.

The wheel or disk 58 is driven by means of a shaft 62, upon which it is mounted and on which it is longitudinally movable. Said shaft is provided with a feather 63, so that the wheel 58 is compelled to rotate with said shaft. As illustrated in Fig. 1, the shaft 62 is journaled at one end in a suitable bearing 64 at the upper end of the auxiliary standard 12 and is connected at its outer end by a connecting-rod 65 with the outer end of the sleeve 51, thus securing said shaft and sleeve together and forming a brace for such parts. 66 indicates a pulley on one end of the shaft 62 for driving said shaft. The pulley 66 may be driven from any suitable source of power.

The friction-wheel 58 is moved longitudinally of the shaft 62 in unison with the pinion 59 by means of a fork, comprising arms 67 68, mounted upon the opposite ends of a rod 69, carried by the arms 55, as best shown in Figs. 2 and 8. As best shown in Fig. 7, the upper ends of the arms 67 68 span the shaft 62 at the opposite ends of the hub 70 of the wheel 58. Consequently as the sleeve 50 moves longitudinally of the shaft 51 it carries the rod 69 and arms 67 68 with it, and the wheel 58 is accordingly moved longitudinally upon the shaft 62 without, however, interfering with its freedom of rotation. In order to further provide for adjusting the friction-contact between the wheel 58 and the pinion 59, the rod 69 is made longitudinally adjustable in its bearings. This is secured by providing said rod with screw-threads, as shown in Fig. 7, and mounting upon said rod between the arms 55 an adjusting-nut 71. By rotating said nut the rod 69 may be moved in one direction or the other, consequently adjusting the wheel longitudinally toward or from the pinion 59. The arm 67 is adjustable upon the rod 69, being secured thereupon between nuts 72 73, as shown in Fig. 7.

In operation the stereotype-plates to be routed are secured upon the members of the plate-support, and the lever 24 is then depressed, raising the stereotype-plates into close proximity with the routing-tool. The tool is then adjusted so as to lie in the same vertical plane as the part to be cut out, after which the plate-support is raised and rotated as much as may be necessary to cut out such portions as lie in the same vertical plane. It will be understood that during the entire operation the routing-tool is rotated at a high rate of speed in the manner described. Obviously, by the construction described, if desired, the routing-tool may be caused to cut along curved lines as well as straight ones, as by rotating the hand-wheels 40 and 57 at the same time the effect is the same as though the routing-tool were given a compound movement.

It should be understood that my invention is not restricted to the specific details of the construction described, except in so far as they are particularly claimed, as obviously many variations may be made without departing from my invention. For example, instead of making the plate-support of two separate sections various other arrangements may be made for providing for supporting-plates of different sizes, and such are included in my invention, generically considered.

Having thus described specifically the embodiment of my invention illustrated in the accompanying drawings, what I claim is—

1. In a routing-machine, the combination of a shaft, and a rotary plate-support mounted on said shaft, said plate-support being composed of a plurality of sections fitted together, each of said sections having a sleeve fitting upon said shaft and acting to secure the section thereto, the outer surfaces of said sections being curved.

2. In a routing-machine, the combination of a non-rotary shaft, and a plate-support rotatably mounted on said shaft, said plate-support being composed of a plurality of sections fitted together, each of said sections having a sleeve fitting upon said shaft and acting to secure the section thereto, the outer surfaces of said sections being curved and of different degrees of curvature.

3. In a routing-machine, the combination of a non-rotary shaft, a plate-support rotatably mounted on said shaft, said plate-support being composed of a plurality of sections adapted to fit together and having bearings fitting upon said shaft, the surfaces of said sections being curved, a routing-tool, and means for moving said shaft toward and from said routing-tool.

4. In a routing-machine, the combination of a non-rotary shaft, a plate-support rotatably mounted on said shaft, said plate-support being composed of a plurality of sections adapted to fit together and having bearings fitting upon said shaft, the surfaces of said sections being curved and of different degrees of curvature, a routing-tool, and means for moving said shaft toward and from said routing-tool.

5. In a routing-machine, the combination of a non-rotary shaft, a plate-support rotatably mounted on said shaft, said plate-support being composed of a plurality of sections adapted to fit together and having bearings fitting upon said shaft, the surfaces of said sections being curved, a routing-tool, means for moving said shaft toward and from said routing-tool, and a cushioning-spring for said shaft.

6. In a routing-machine, the combination of a non-rotary shaft, a plate-support rotatably mounted on said shaft, said plate-support being composed of a plurality of sections adapted to fit together and having bearings fitting upon said shaft, the surfaces of said sections being curved, a routing-tool, means for moving said shaft toward and from said routing-tool, and means for rotating said plate-support sections upon said shaft.

7. In a routing-machine, the combination of a supporting-shaft, a plate-support composed of separable curved sections having hubs adapted to fit upon said shaft and inwardly-extending flanges at their side edges, a routing-tool, and means for bringing said tool into operative relation to the plate or plates carried by said support, substantially as described.

8. In a routing-machine, the combination of a supporting-shaft, a plate-support composed of separable curved sections having hubs adapted to fit upon said shaft and inwardly-extending flanges at their side edges, said sections being of different diameters, a routing-tool, and means for bringing said tool into operative relation to the plate or plates carried by said support, substantially as described.

9. In a routing-machine, the combination of a rotary plate-support, a routing-tool movable longitudinally of said plate-support, a traveling sleeve supporting said tool, a stationary sleeve upon which said traveling sleeve is mounted, means within said stationary sleeve for moving said traveling sleeve longitudinally, and means for rotating said routing-tool, substantially as described.

10. In a routing-machine, the combination of a rotary plate-support, a routing-tool movable longitudinally of said plate-support, a traveling sleeve supporting said tool, a stationary sleeve upon which said traveling sleeve is mounted, means within said stationary sleeve for moving said traveling sleeve longitudinally, a pinion connected with said tool, a friction-disk engaging said pinion, means for rotating said friction-disk, and means for moving said disk and pinion longitudinally with said tool, substantially as described.

11. In a routing-machine, the combination of a routing-tool, a stationary sleeve, means supporting said tool and movable longitudinally of said stationary sleeve, means within said stationary sleeve for moving said tool longitudinally thereof, and means for rotating said tool, substantially as described.

12. In a routing-machine, the combination of a stationary sleeve, a routing-tool, a traveling support for said routing-tool mounted on said stationary sleeve, means within said sleeve for moving said support longitudinally thereof, mechanism for rotating said tool, and means carried by said support for moving said rotating mechanism longitudinally with said tool, substantially as described.

13. In a routing-machine, the combination of a stationary sleeve, a routing-tool, a tool-support movable longitudinally of said sleeve, means within said sleeve for moving said tool-support longitudinally thereof, a shaft arranged parallel with said stationary sleeve, a driving-disk mounted on said shaft and adapted by its rotation to rotate said tool, and means for moving said disk longitudinally of said shaft with said tool-support, substantially as described.

14. In a routing-machine, the combination of a non-rotary shaft, a plate-support rotatably mounted on said shaft, said plate-support being composed of a plurality of sections adapted to fit together and having bearings fitting upon said shaft, the surfaces of said sections being curved and of different degrees of curvature, a routing-tool, means for moving said shaft toward and from said routing-tool, and means for rotating said plate-support sections upon said shaft.

15. In a routing-machine, the combination of a shaft, a plate-support comprising semicylindrical sections of different diameters, said sections having surfaces adapted to abut, means carried by each of said sections adapted to fit upon said shaft to form supports for said sections, and means for rotating said sections.

16. In a routing-machine, the combination of a vertically-movable plate-support, means for moving said plate-support vertically, a cushioning-spring for said plate-support, means for rotating said plate-support, a routing-tool, and means for rotating the same, substantially as described.

17. In a routing-machine, the combination of a supporting-shaft, a plate-support composed of abutting separable curved sections having supports fitting upon said shaft, a routing-tool, and means for bringing said tool into operative relation to the plate or plates carried by said support.

18. In a routing-machine, the combination of a supporting-shaft, a plate-support composed of separable curved sections, each of said sections having a sleeve fitting upon said shaft, a routing-tool, and means for bringing said tool into operative relation to the plate or plates carried by said support.

19. The combination of a shaft and a plurality of cylinder-segments mounted thereon, said cylinder-segments having abutting longitudinal margins and each having an axially-disposed sleeve fitting upon said shaft and acting to secure the segment thereto.

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