

No. 643,707.

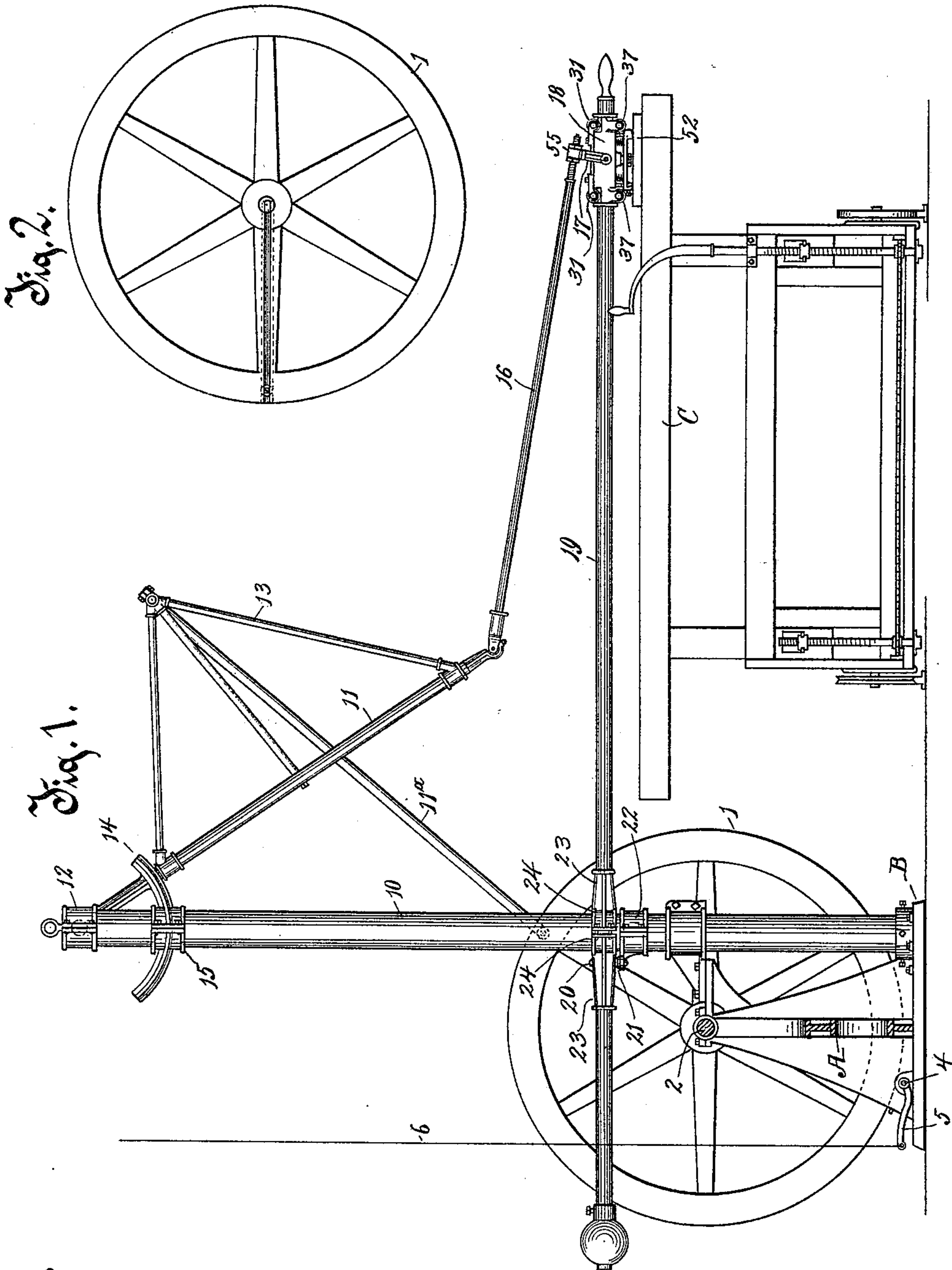
Patented Feb. 20, 1900.

C. S. YARNELL.  
ABRADING OR POLISHING MACHINE.

(Application filed Sept. 23, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

*C. K. Keeney.*

*Anna V. Faust.*

Inventor.

*Charles S. Yarnell*

*By Benedict & Monell*

*Attorneys.*

No. 643,707.

Patented Feb. 20, 1900.

C. S. YARNELL.  
ABRADING OR POLISHING MACHINE.

(Application filed Sept. 23, 1899.)

(No Model.)

3 Sheets—Sheet 2.

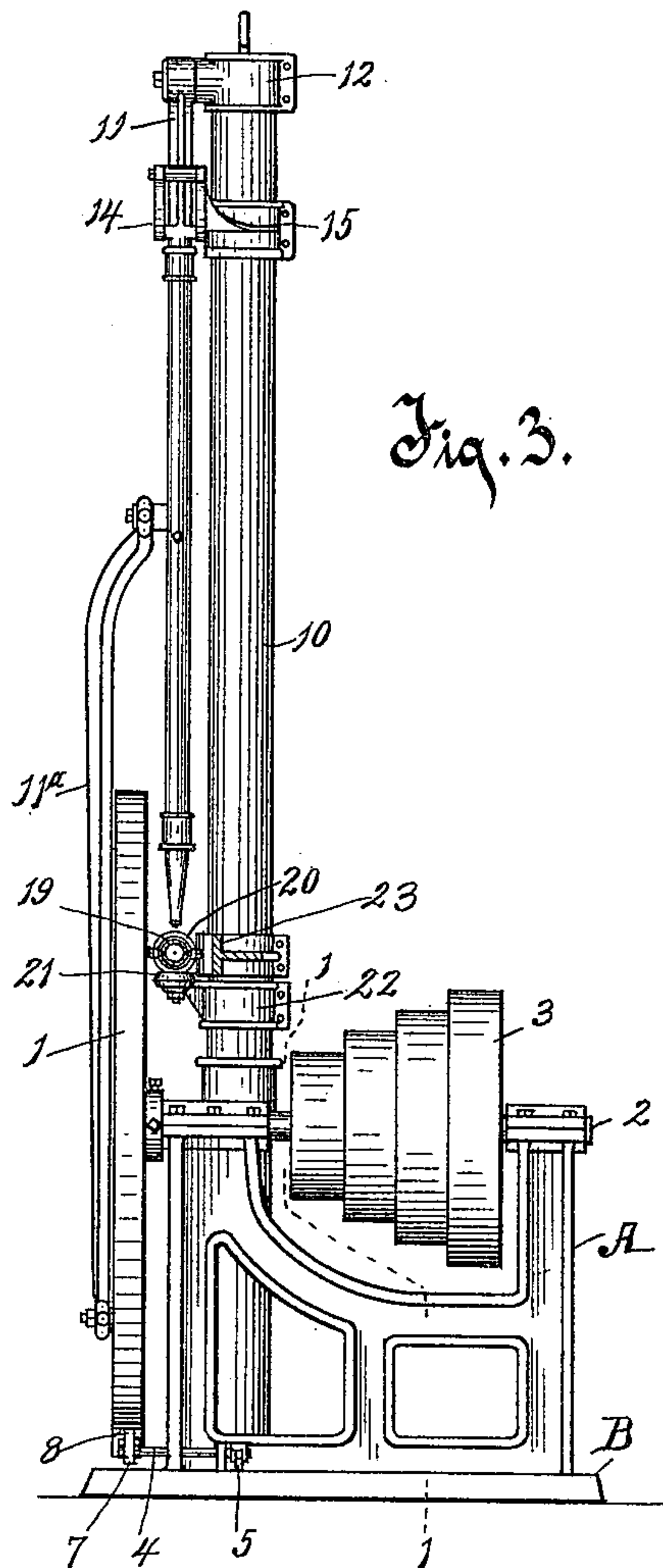


Fig. 3.

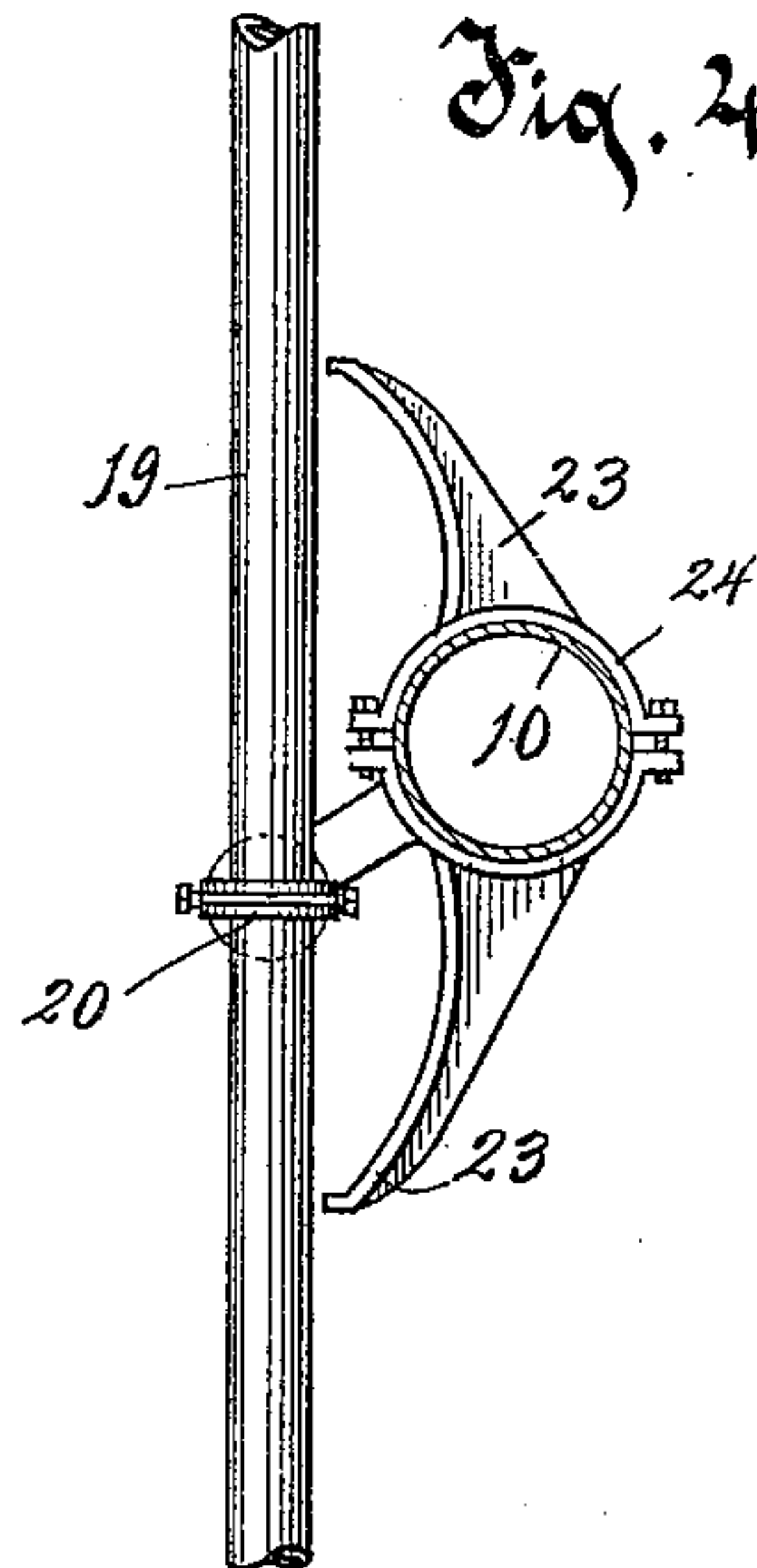


Fig. 4.

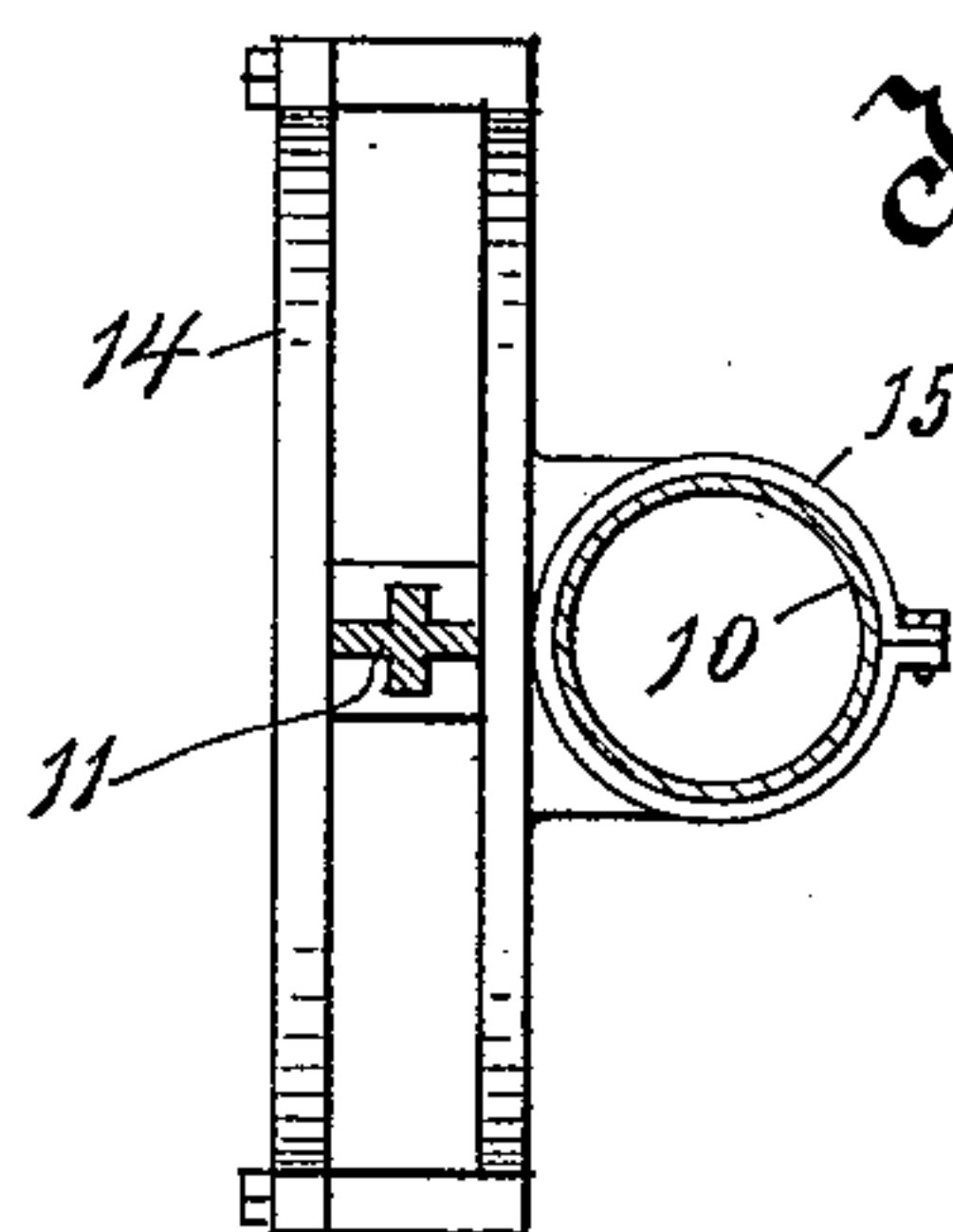


Fig. 5.

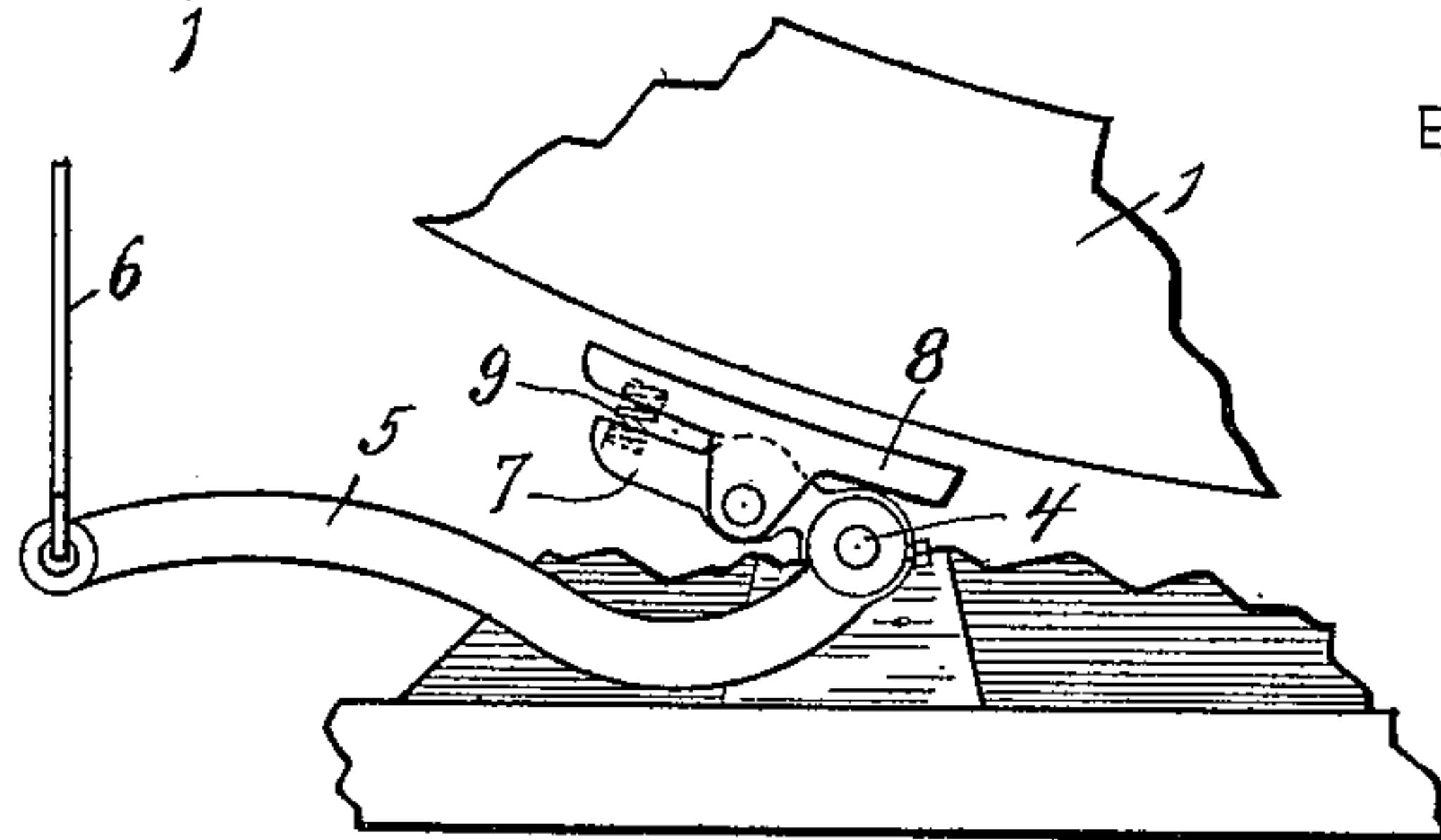


Fig. 6.

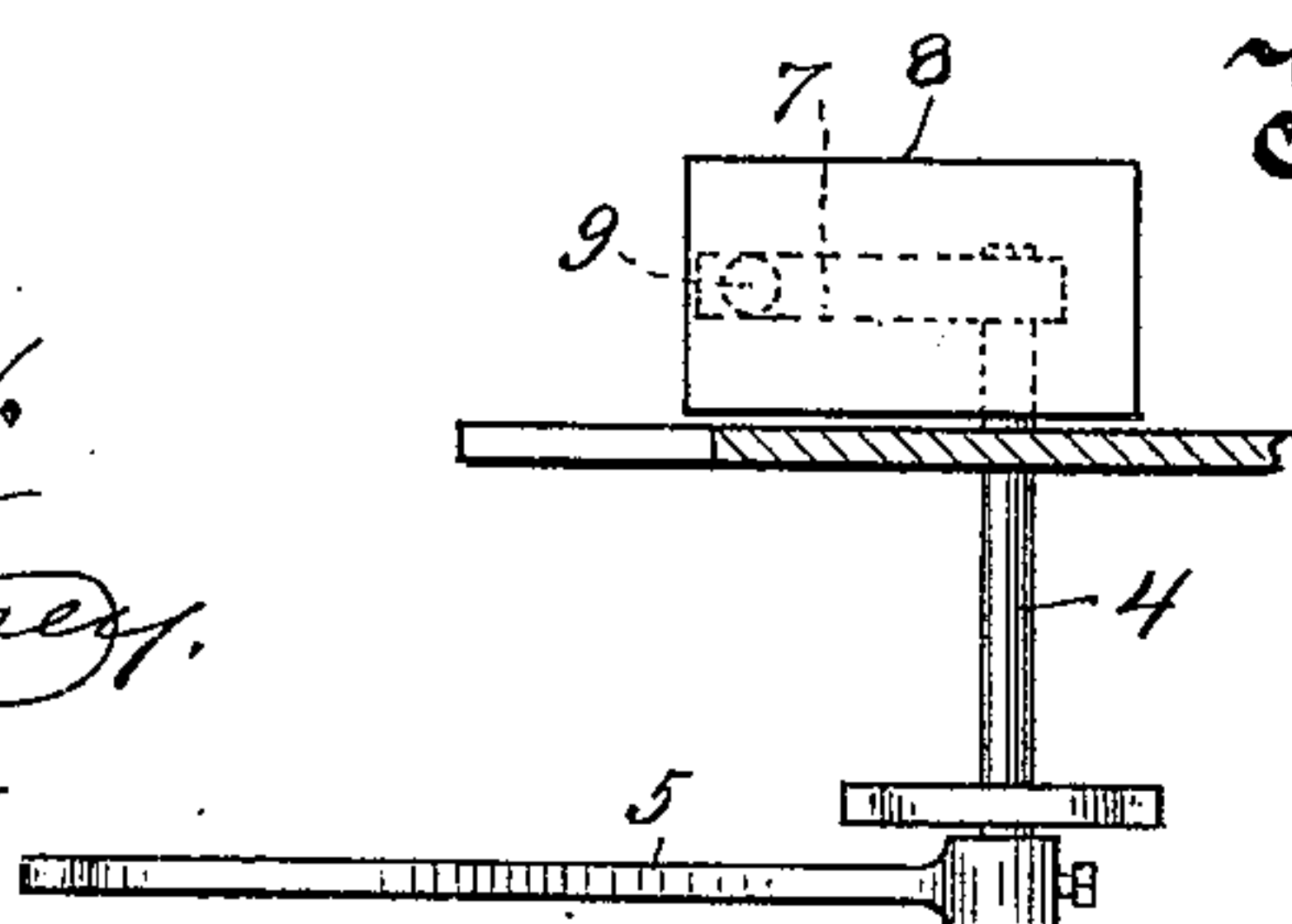


Fig. 7.

Witnesses.  
C. H. Keeney.  
Anna C. Faust.

Inventor.  
Charles S. Yarnell  
By Benedict Monell  
Attorneys.

No. 643,707.

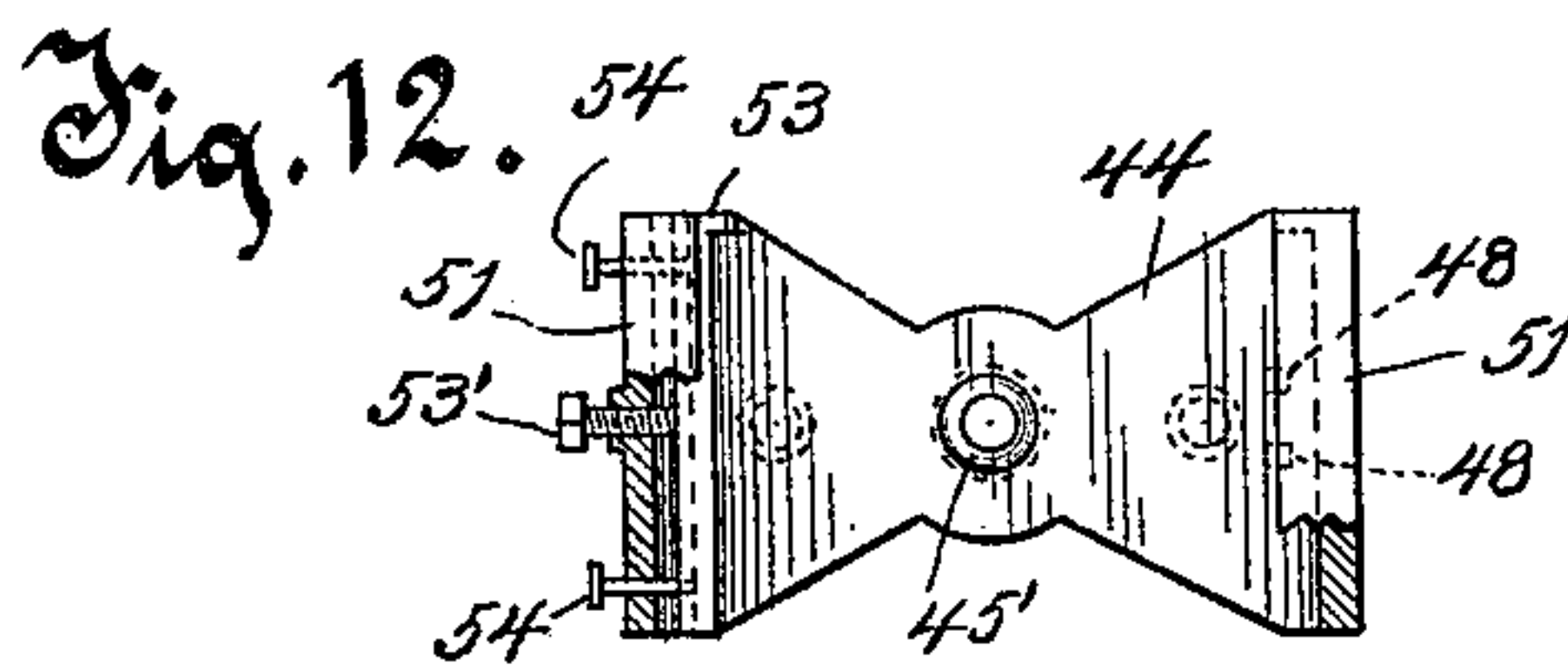
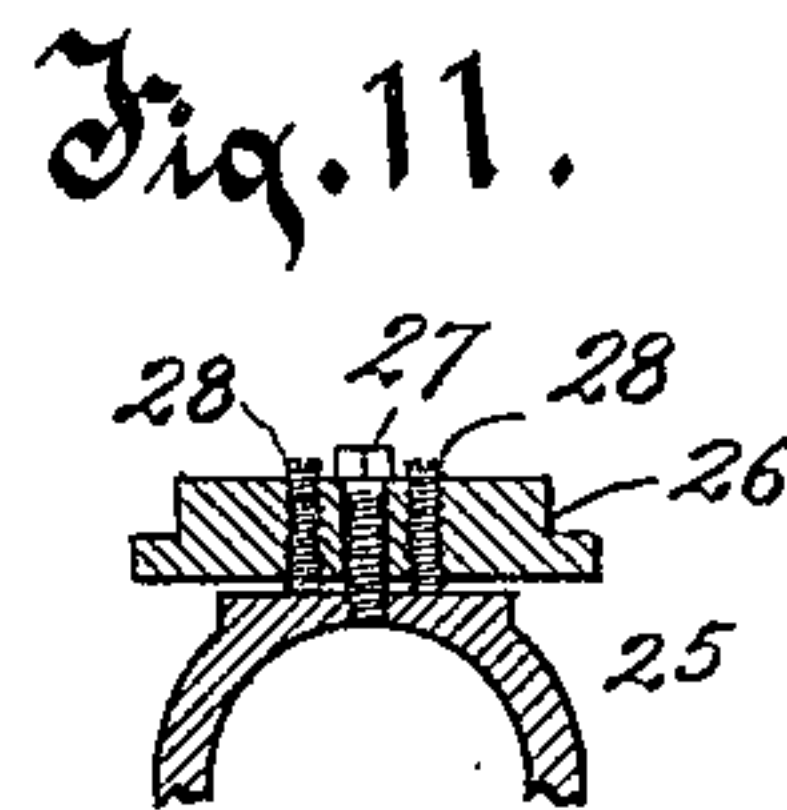
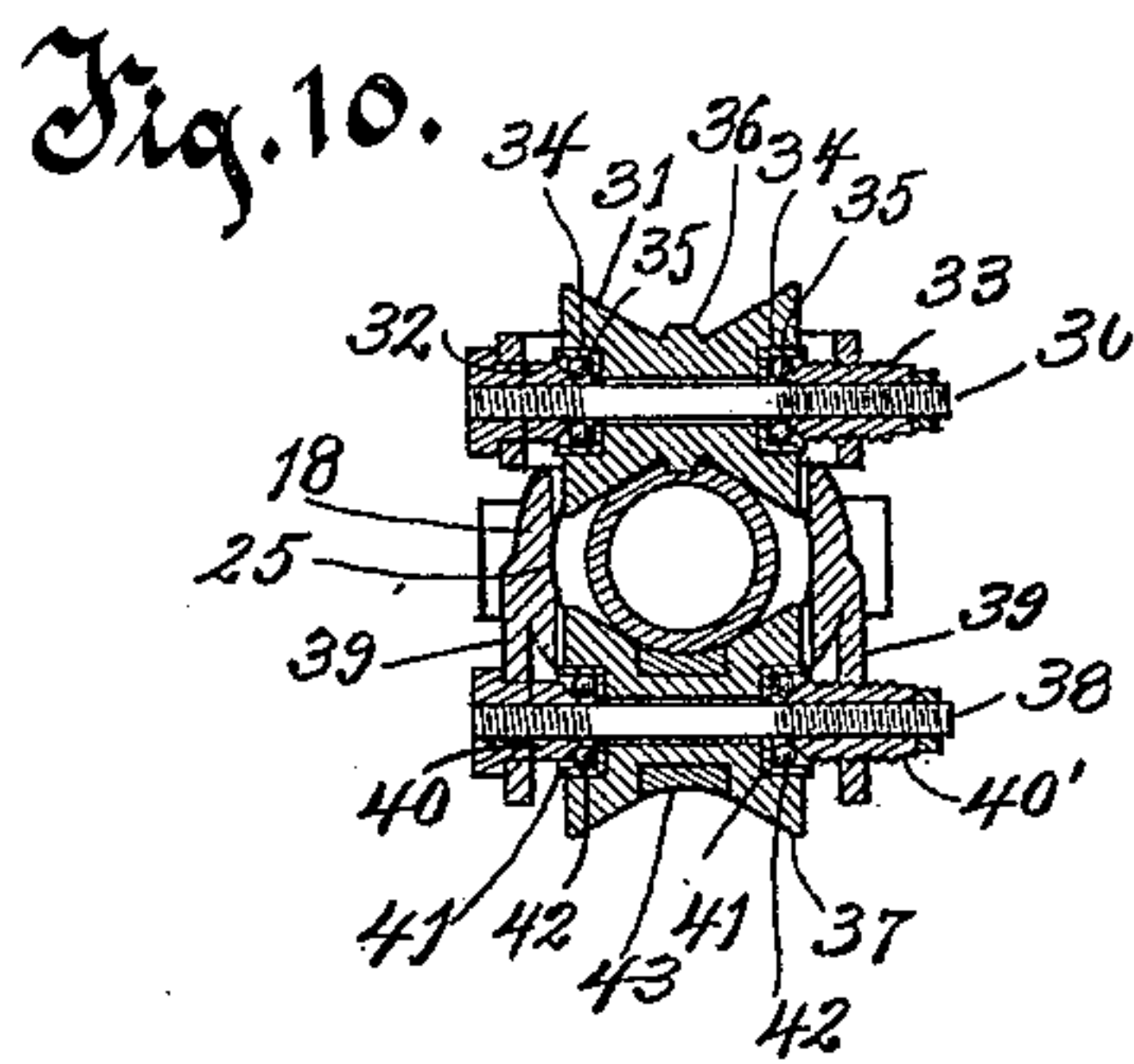
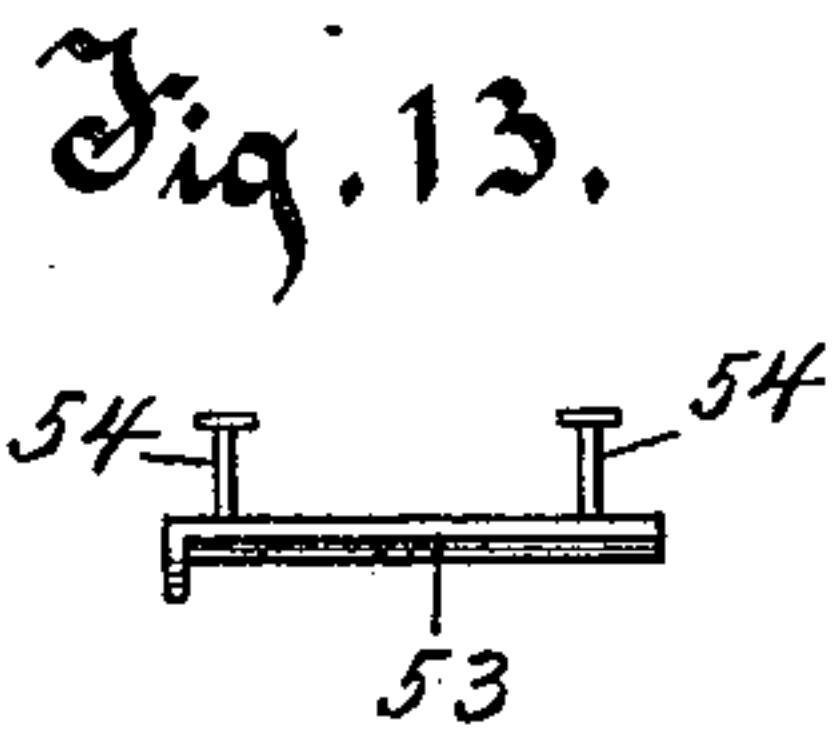
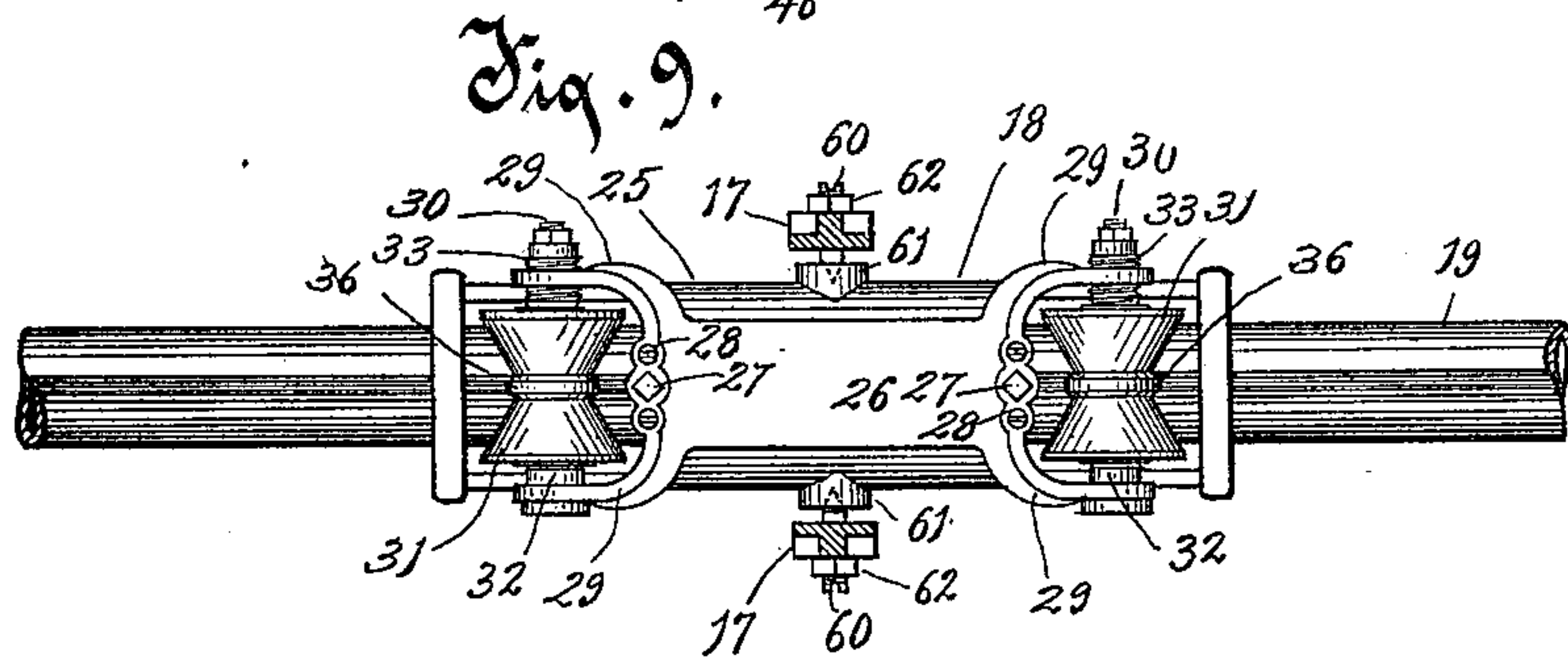
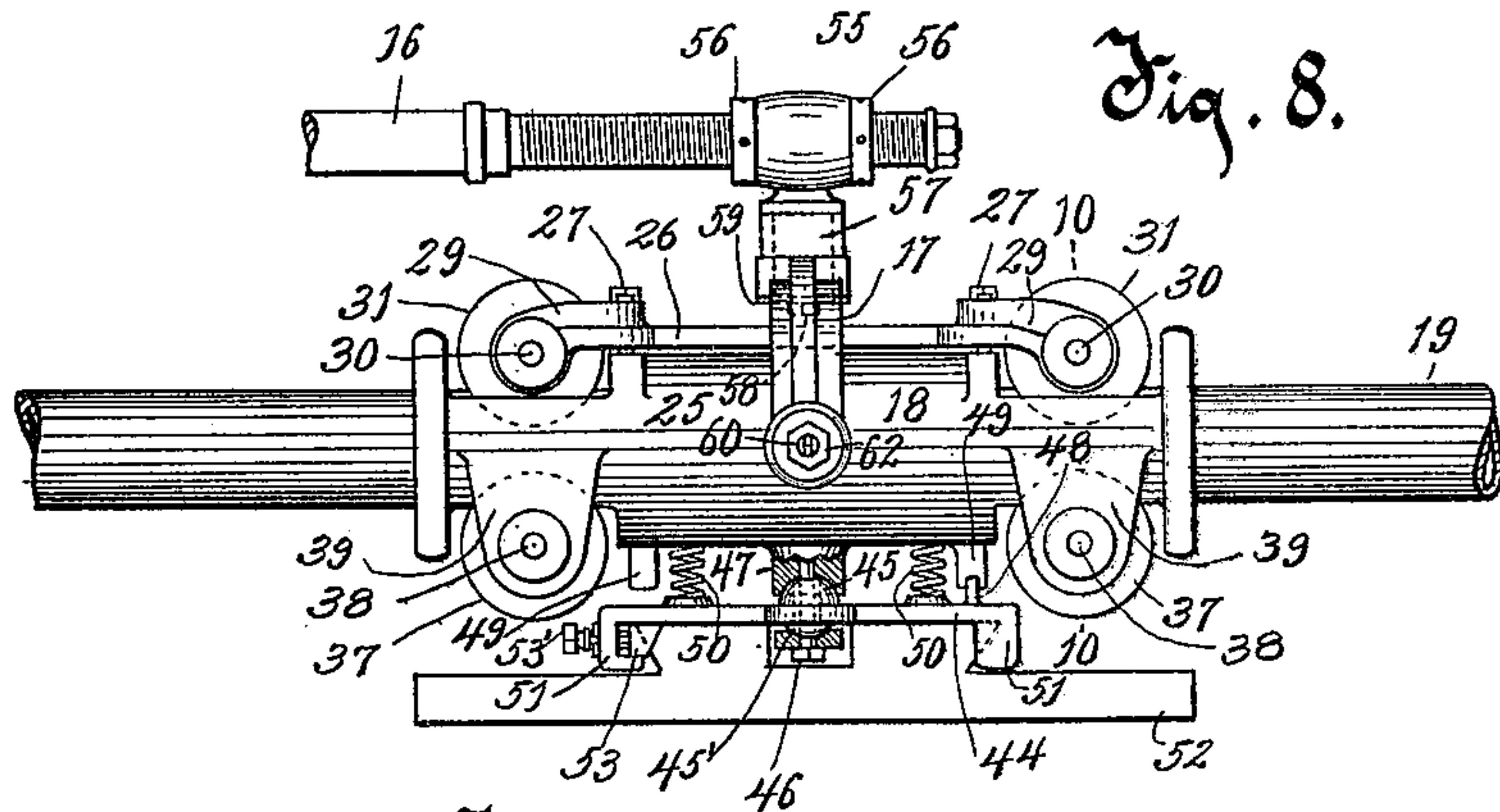
Patented Feb. 20, 1900.

C. S. YARNELL.  
ABRADING OR POLISHING MACHINE.

(Application filed Sept. 23, 1899.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:  
A. H. Keeney,  
Anna C. Faust.

Inventor:  
Charles S. Yarnell  
By Benedict Morrell  
Attorneys.



# UNITED STATES PATENT OFFICE.

CHARLES S. YARNELL, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE  
MOORE CARVING MACHINE COMPANY, OF SAME PLACE.

## ABRADING OR POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 643,707, dated February 20, 1900.

Application filed September 23, 1899. Serial No. 731,402. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES S. YARNELL, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and  
5 useful Improvement in Abrading or Polishing Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 My invention relates to improvements in an abrading or polishing machine of the general character of the machine shown and described in Letters Patent No. 507,280.

15 The invention consists in the improved parts and the combinations thereof in the machine or the equivalents thereof.

In the drawings, Figure 1 is a side elevation of the improved machine, parts being shown in section on line 1 1 of Fig. 3. Fig. 2 is an  
20 elevation of the fly-wheel, showing means for attaching a connecting-rod adjustably thereto. Fig. 3 is an end elevation of the improved machine, the guide-rod and guard being shown in section. Fig. 4 is a top plan  
25 view of a guard or stop on the post adapted to prevent swinging of the guide-rod. Fig. 5 is a plan view of a guide preventing lateral play of the vibrating arm. Fig. 6 is an elevation of a brake for the fly-wheel. Fig. 7  
30 is a top plan view of the brake shown in Fig. 6. Fig. 8 is an elevation of the polisher-carriage on the guide-rod and related parts, parts being broken away for convenience of illustration. Fig. 9 is a top plan view of the  
35 carriage shown in Fig. 8. Fig. 10 is a cross-section of the carriage and guide-rod on line 10 10 of Fig. 8. Fig. 11 is a detail in cross-section of means for adjusting the top plate on the carriage shown in Figs. 8 and 9. Fig.  
40 12 is an under view of the head-block mounted on the under side of the carriage of Figs. 8 and 9, parts being broken away for convenience of illustration. Fig. 13 is a top plan view of a clamping-block forming a part of  
45 the head-block shown in Fig. 12.

In the drawings, A is a frame, and B the base thereof, the frame and base being of such form and size as properly to adapt it for supporting parts of the mechanism thereon. A  
50 fly-wheel 1 of large size is mounted on the shaft 2, that has its bearings in the frame A.

A stepped or speed driving-pulley 3 is also fixed on the shaft 2. A brake for holding the fly-wheel 1 against rotation consists of a rock-shaft 4, mounted on the frame and pro-  
55 vided with a crank 5, to which an actuating-cord 6 may be attached. The shaft 4 is provided with a radial arm 7, and a brake-shoe 8, having medial lugs, is pivoted thereby medially on the arm 7 in such manner that the  
60 face of the shoe is normally opposite and near to the periphery of the fly-wheel 1. A spring 9, inserted between the arm 7 and the shoe 8 at one side of the axis of the shoe, is adapted to hold that extremity of the shoe  
65 yieldingly away from the arm and toward the fly-wheel. This construction adapts that end of the shoe that is supported by the spring 9 to first contact yieldingly against the periphery of the fly-wheel when the brake is car-  
70 ried to the fly-wheel by the rocking of the shaft 4 and when the brake-shoe is brought against the wheel permits of the adjustment of the shoe to the surface of the wheel in such manner as to obviate any rattle or noise and  
75 to secure the most complete and extensive bearing of the shoe on the wheel obtainable.

A standard 10 is located at the side of and adjacent to the fly-wheel 1 and is preferably held in upright position by being secured to  
80 the base B, conveniently by a collar bolted to the base, in which collar the post 10 is footed. A vibrating arm 11 is pivoted, and thereby suspended, on the post, conveniently by being pivoted on a pin rigid on a split  
85 collar 12, that is clamped on the standard 10. The arm 11 is provided with a laterally-projecting truss 13, connected to the fly-wheel 1 eccentrically and adjustably by a pitman 11<sup>a</sup>, and the arm travels in a slotted segmental  
90 guide 14, the guide being adapted to prevent undesired lateral play of the vibrating arm. The guide 14 is rigid on a split collar 15, clamped on the standard 10. A connecting-rod  
95 16 is jointed at its inner end to the free outer extremity of the vibrating arm 11 and at its outer end is connected through a yoke 17 to a carriage 18. The carriage 18 is mounted reciprocally on a guide-bar 19, that is piv-  
100 oted so as to be capable of tilting vertically in a collar 20 by means of cone-pointed pins set in the collar 20, Fig. 3, and the collar 20



is swiveled for swinging horizontally by a pintle affixed thereto and entering the head 21, rigid on the split collar 22, clamped on the standard 10. A guard adapted to prevent undue swinging or movement of the guide-bar 19 laterally consists of two fingers 23 23, each rigid to the half of a divided clamping-collar 24, which collar is clamped by bolts through the extremities of its members to the standard 10. This construction permits of the adjustment of the fingers 23 at any desired distance within certain limits from the guide-bar 19, and as the extremities of the fingers are at a considerable distance apart on opposite sides of the laterally-swiveling axis of the guide-bar the lateral play of the guide-bar 19 can thereby be obviated or suitably controlled.

The carriage 18 consists, as stated in a general way, of a tubular body portion 25, somewhat larger than and surrounding the guide-bar 19, and means for mounting it reciprocally on the guide-bar and means for connecting it to related mechanisms. A carriage-plate 26 is secured near its respective ends to the upper surface of the body 25 by bolts 27 27, passing loosely through the plate in a central longitudinal line and turning into the body 25, and is made adjustable tiltably on the body 25 by screws 28 28 in pairs, one at each side of each bolt 27, turning through the plate 26 against the surface of the body 25. At each end the plate 26 is provided with spreading legs 29 29, in the free extremities of each pair of which legs an axle 30 is inserted and supported, and each axle carries thereon a spool-shaped roller 31, fitted and adapted to travel on the guide-bar 19. At one end each of said axles 30 is provided with a sleeve-like cone 32, turning by screw-thread on the end of the axle and having a head adapted to bear against the leg 29. At the other extremity of the axle 30 there is a sleeve-cone 33, turning by screw-thread on the axle 30 and by exterior screw-thread in and through the opposite leg 29. Annular ball-bearing cups 34 are set in the ends of the rollers 31 about the axle 30, and bearing-balls 35 are interposed between the cups and the cones 32 and 33. An annular rib 36 about each of the rollers 31 centrally fits and travels in a longitudinal groove therefor in the bar 19, holding the carriage in position against rotatable movement on the bar. On the lower side of the carriage-body 25 rollers 37 37 are mounted opposite the rollers 31 31 and on axles 38 38, supported in legs 39 39, depending from the body of the carriage. These rollers 37 are mounted rotatably on the axles 38 by means of sleeve-cones 40 40', ball-bearing cups 41, and bearing-balls 42, that are substantially duplicates in construction and arrangement of the similar parts by means of which the rollers 31 are mounted on the body of the carriage above. The rollers 37 are each provided centrally with an annular inserted band or bushing 43, of soft metal,

adapted to bear against the bar 19 on the under side and forming a tread that frictionally so adheres to the bar as to prevent any sliding of these rollers on the bar. The rollers 31 and 37 by reason of their reversely-formed truncated cone or spool shape are adapted to fit on and partially about the cylindrical bar 19.

Below the body 25 of the carriage a longitudinally-extended head-block 44, provided centrally with upwardly and downwardly projecting semispherical bosses 45 45', is secured to the carriage-body 25 by means of a bolt 46, passing loosely in an aperture therefor vertically through the head-block 44 at the diametrical axis of the bosses 45 45' and turning into a boss 47, integral with the body 25. A pair of upwardly-projecting pins 48 48 on the head-block 44 straddle a lug 49, depending from the carriage-body 25, and prevent the lateral swing of the head-block. Springs 50 50, interposed one at each side of the bolt 46 between the head-block 44 and the carriage-body 25, are adapted to hold the respective ends yieldingly substantially equidistant from the under side of the carriage-body and permit of the slight movement of the polishing-block, whereby it adapts itself to the surface of the material being abraded or polished. The extremities of the head-block 44 are turned downwardly and then inwardly, forming ways or devices 51 for supporting the polishing-block 52 detachably thereon. The polishing-block 52 is provided with a raised portion transversely thereof centrally, which has overhanging edges fitted and adapted to enter above and within the supporting devices 51. At one end of the head-block 44 the overhanging wall of the polishing-block 52 enters and bears against the device 51, while at the other end of the head-block 44 there is a slidable clamp 53, Figs. 8, 12, and 13, fitted in the supporting device 51 at that end of the head-block 44, which is adapted to be forced against the overhanging wall of the block 52 by means of the set-screw 53', turning through the downwardly-turned end of the head-block against the clamp. Guide-pins 54 54, fixed in the clamp 53, pass movably through the end of the head-block and limitedly control the movement of the clamp reciprocally on the supporting device. The block 52 is adapted to receive and hold on its under surface abrading or polishing material.

The carriage 18 is secured to the rod 16 by means of a sleeve 55, fitted movably on the extremity of the rod and held to place adjustably against longitudinal movement thereon by set-nuts 56 56, turning by screw-thread on the rod against the ends of the sleeve. The sleeve 55 is provided with a downwardly-extending pintle 57, (shown in broken lines in Fig. 8,) that fits and swivels medially in the yoke 17, being secured in place therein by a bolt 58 and a washer 59, the bolt passing loosely through the yoke and turning into the pintle. The yoke 17 at its furcate extremi-



ties is pivoted on the carriage-body 25 substantially in the line of its diameter by conically-pointed pins 60 60 through the extremities of the yoke and bearing in sockets therefor in trunnion-bosses 61 61 on the carriage-body 25. Nuts 62 turn on the pins 60 against the legs of the yoke. This means of connection of the rod 19 to the carriage-body 25 by the yoke 17, straddling the body and pivoted thereto substantially in the line of its horizontal diameter, is adapted to steady the movement of the carriage on the rod 19 and prevent binding of the carriage on the rod.

By mounting the fly-wheel 1 on a frame substantially independent of the standard 10, on which the operative mechanism is principally supported, a shaking of the standard is obviated, which is found to exist in those machines in which the fly-wheel is mounted on the standard. A standard much lighter in weight can be employed than when the fly-wheel is mounted on the standard, and the fly-wheel can be mounted in a much lower position, and a heavy fly-wheel, securing greater steadiness of movement, can be employed to great advantage in the work of abrading or polishing material and in the expense of construction of the machine.

In Fig. 1 a material-supporting table C is shown in connection with the improved polishing-machine to illustrate the method of using the improved machine. The material-supporting table forms no part of the present invention.

What I claim as my invention is—

1. In an abrading or polishing machine, the combination with a standard and a vibrating arm pivoted on the standard, of a segmental slotted guide clamped to the standard through which guide the vibrating arm extends and in which it vibrates and by which it is prevented from movement laterally out of the plane of its vibration.

2. In an abrading or polishing machine, the combination with a standard, of a guide-bar swiveled vertically and pivoted horizontally on the standard, and a guard clamped adjustably on the standard projecting to near the guide-bar at both sides of its swiveling support on the standard, the guard being adapted to limit and substantially prevent lateral play of the guide-bar.

3. In an abrading or polishing machine, the combination with a guide-bar, and a carriage reciprocable on the guide-bar, of a vibrating arm, a rod connected at one end to the vibrating arm, and a yoke to which the connecting-rod is swiveled at its other end, said yoke straddling the carriage and being pivoted thereto at its furcate ends substantially in the line of the horizontal diameter of the carriage.

4. A carriage in a polishing-machine, comprising a tubular body part, a top detachable

plate provided with legs, spool-shaped rollers mounted in said legs, and other spool-shaped rollers mounted under the body part in legs thereon, the upper and lower spool-shaped rollers being adapted to travel on the upper and under surfaces respectively of a guiding-bar.

5. In a carriage in an abrading or polishing machine, the combination of a tubular body part, a plate secured above to the body part by bolts in a medial longitudinal line thereof, and screws in pairs one on each side of each of said securing-bolts turning in the plate against the body part adapted to adjust the plate tiltably on the body part.

6. In a carriage in an abrading or polishing machine, the combination of a tubular body part, and spool-shaped rollers mounted one at each end in the upper portion of the body part said rollers being each provided with an annular rib medially adapted to travel in a groove therefor in a guide-bar on which said carriage is reciprocable.

7. In a carriage in an abrading or polishing machine, the combination of a tubular body part, and spool-shaped rollers mounted one at each end in the tubular body part, said rollers being severally provided with a soft-metal band medially forming an adhering tread adapted to travel on the guide-bar on which the carriage is reciprocable.

8. In a carriage in an abrading or polishing machine, the combination with a tubular body part provided with legs in pairs, of rollers severally mounted in a pair of said legs by means of an axle, a sleeve-cone in a leg turning by screw-thread on the axle, another sleeve-cone in the other leg turning by screw-threads respectively on the axle and in the leg, ball-bearing cups in the ends of the rollers opposite said cones, and bearing-balls between the cones and cups.

9. In an abrading or polishing machine, the combination of a tubular carriage reciprocable on a guide-bar, a head-block swiveled and tiltably medially on the carriage, and expanding springs, inserted one at each side of the tilting connection, between the carriage and the head-block.

10. In an abrading or polishing machine, the combination with a reciprocable carriage, of a head-block pivoted thereto, a polisher-block having overhanging walls adapted to enter supporting-ways therefor in the head-block, and an adjustable clamp in the head-block provided with means for setting it up against the polisher-block.

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

CHARLES S. YARNELL.

Witnesses:

E. A. FORCE,

GEO. F. PORTER.