

No. 678,865.

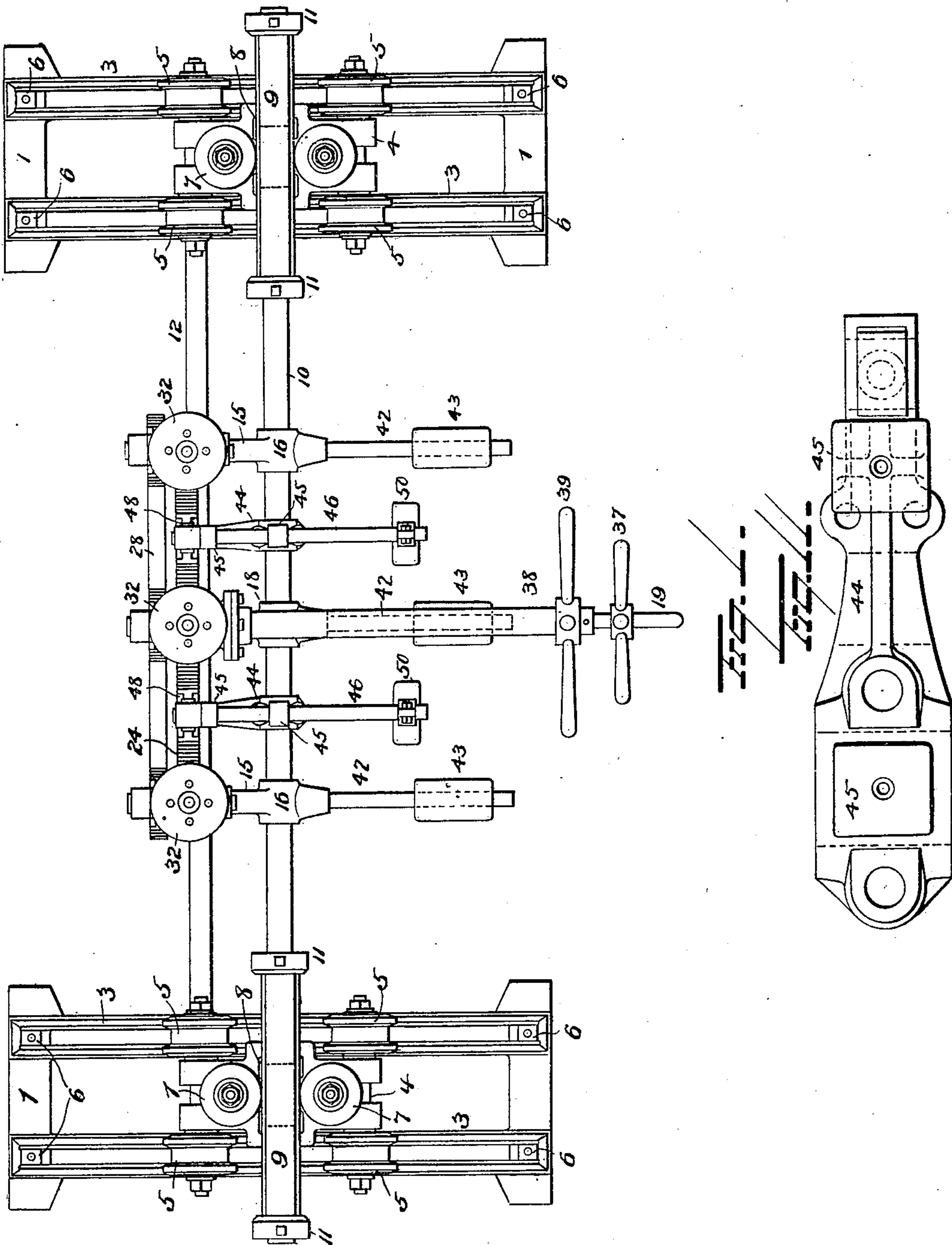
Patented July 23, 1901.

S. DIESCHER.
GRINDING MACHINE.

(Application filed Jan. 19, 1901.)

(No Model.)

6 Sheets—Sheet 1.



WITNESSES
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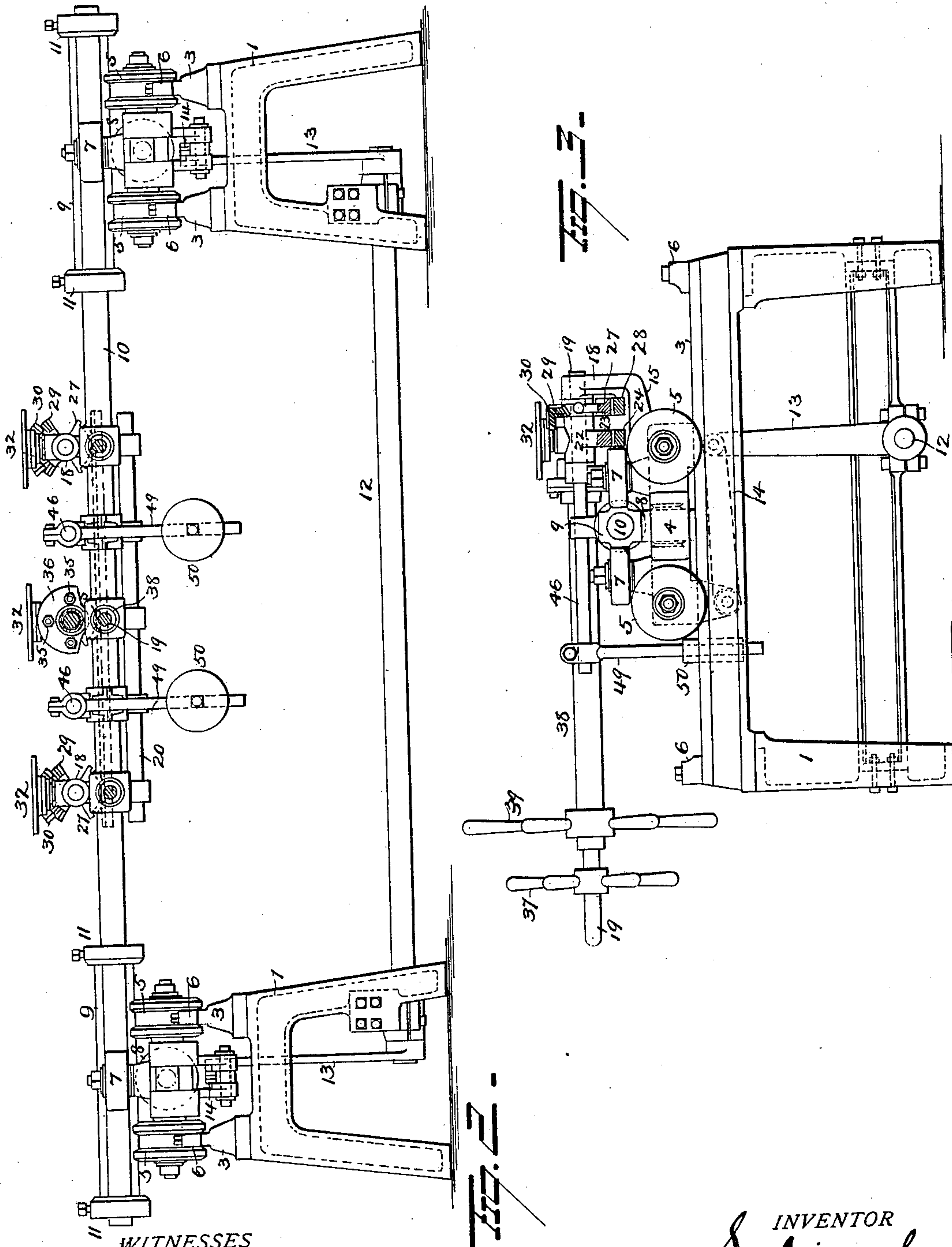
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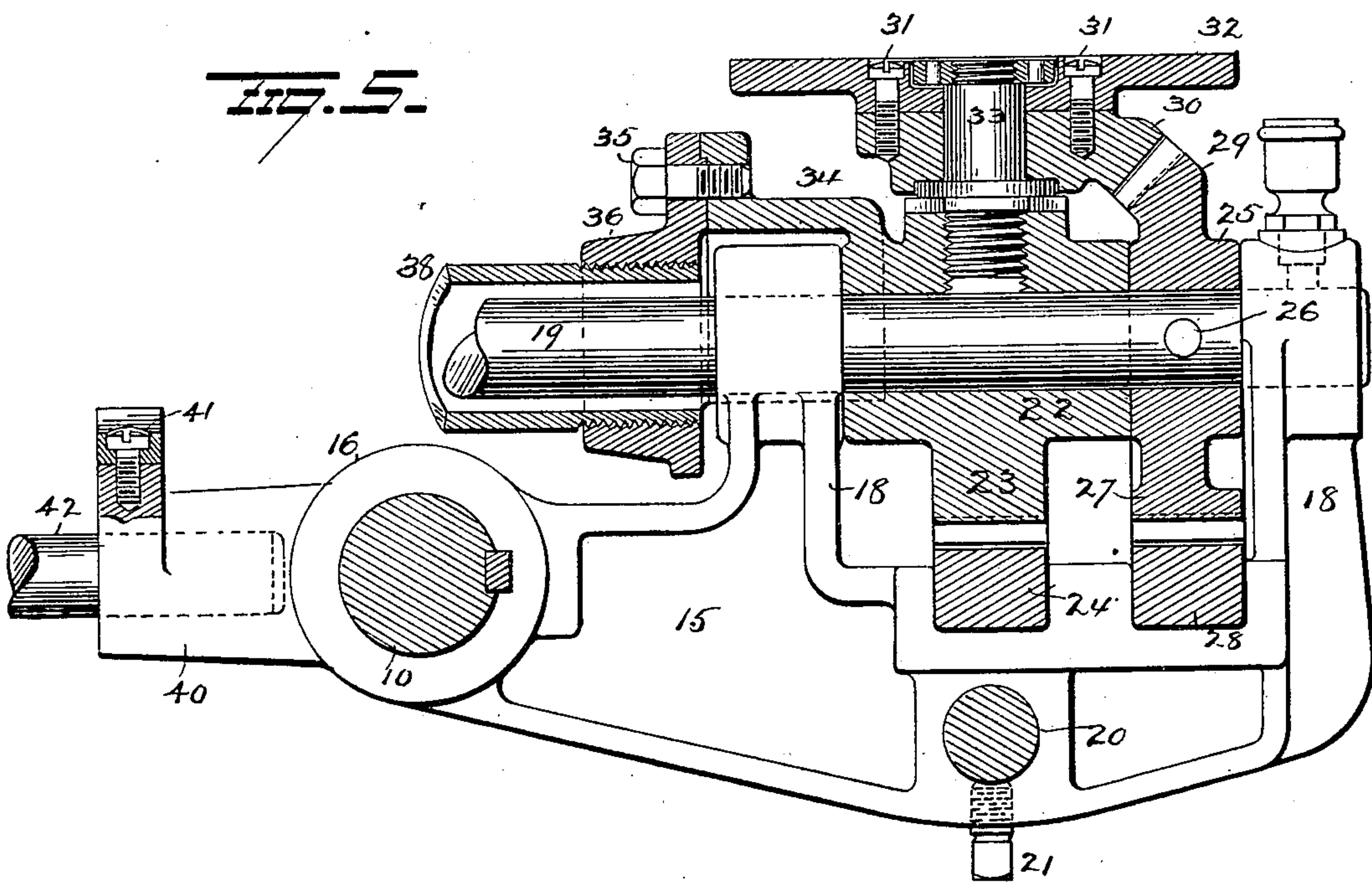
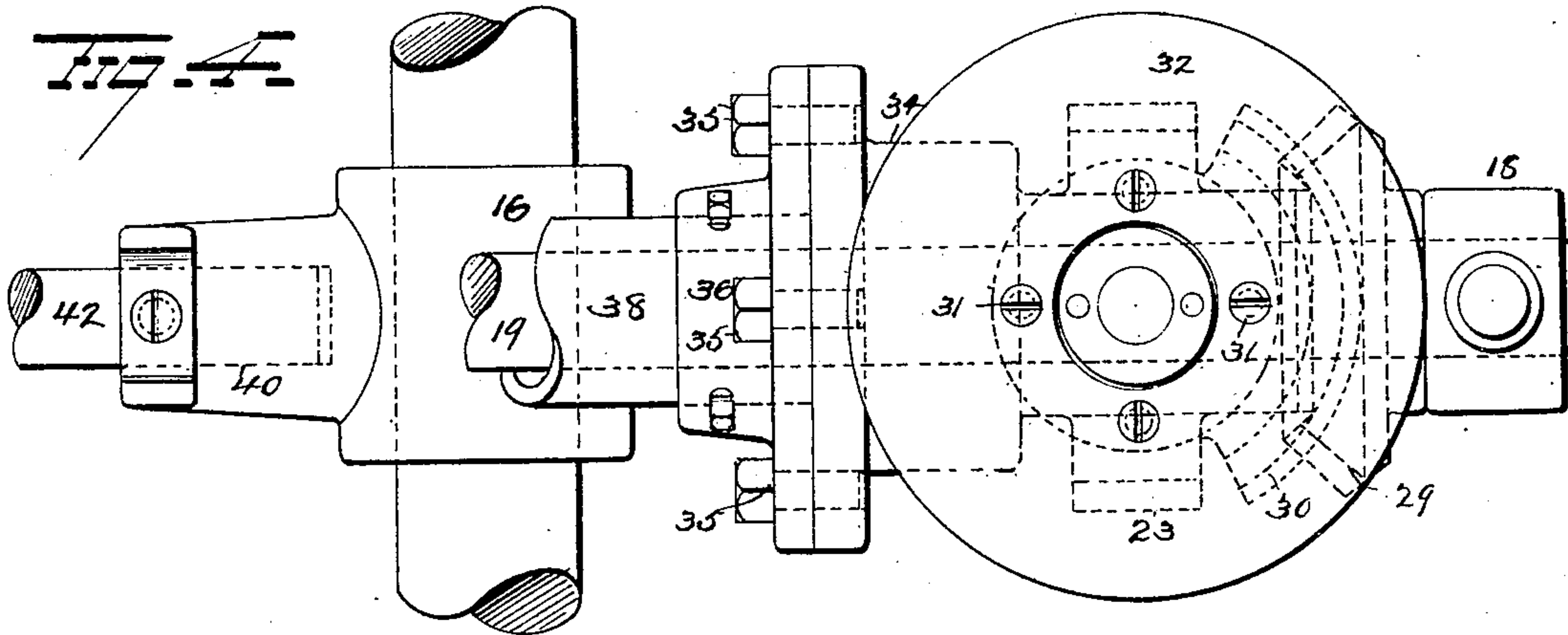
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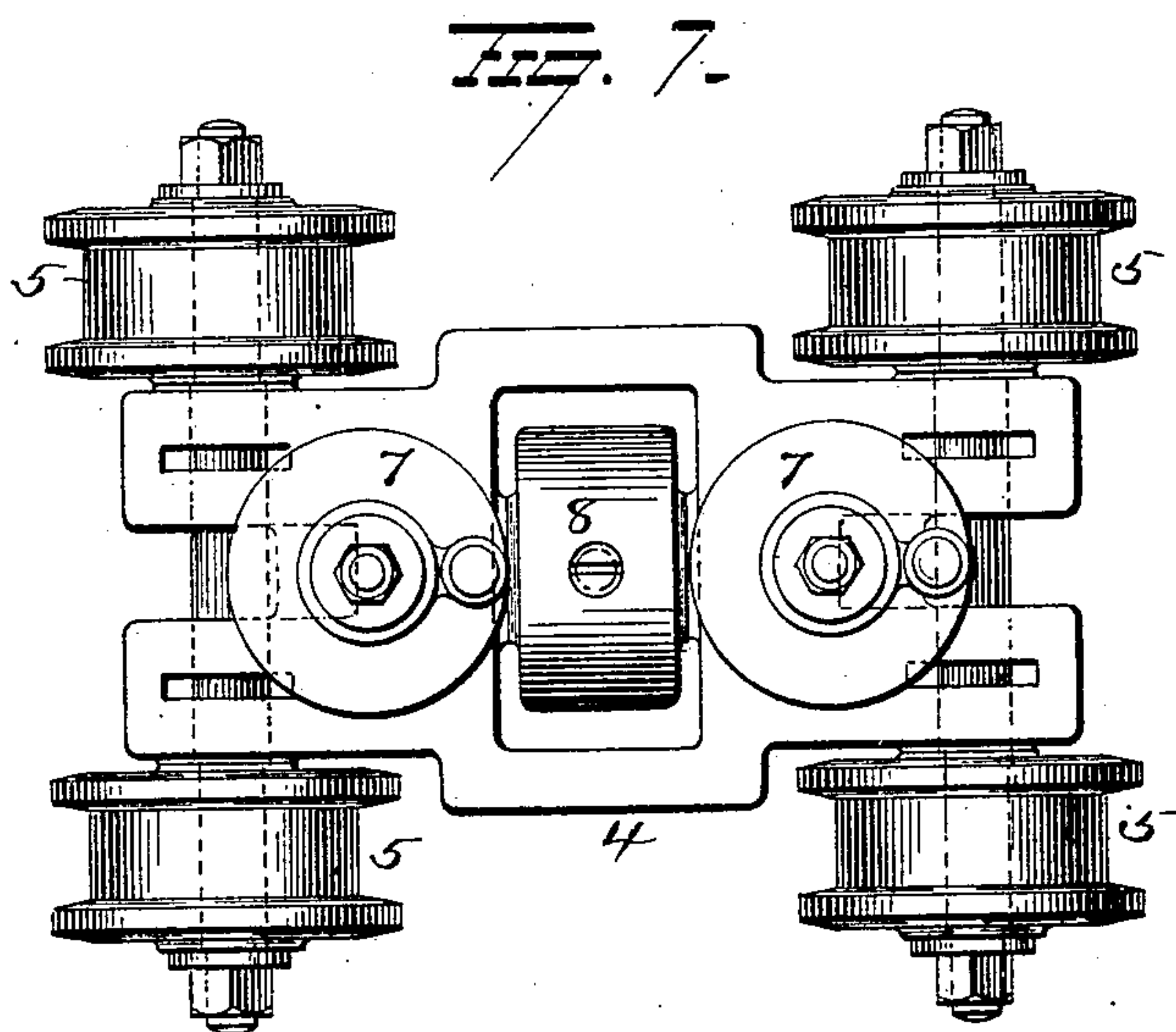
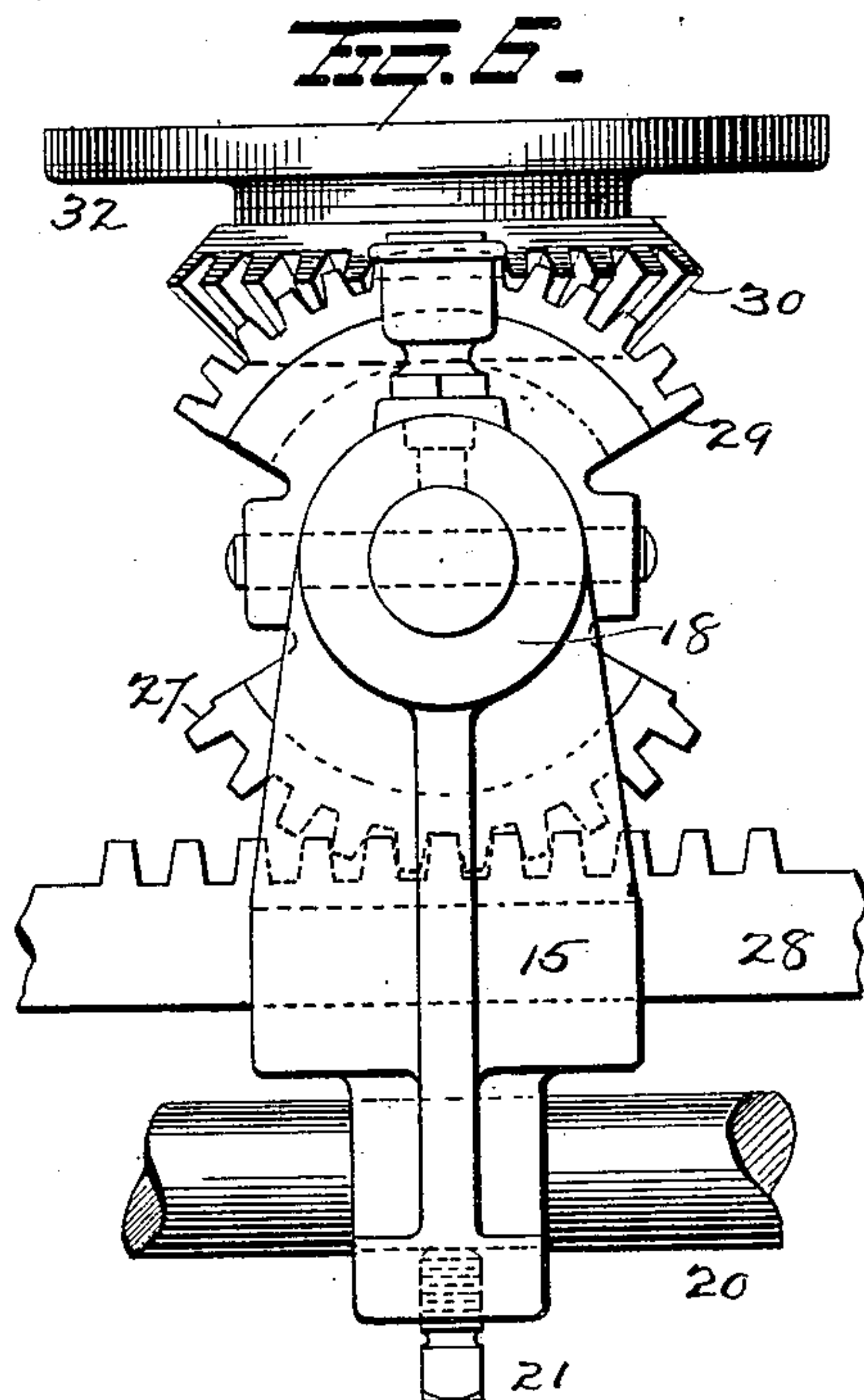
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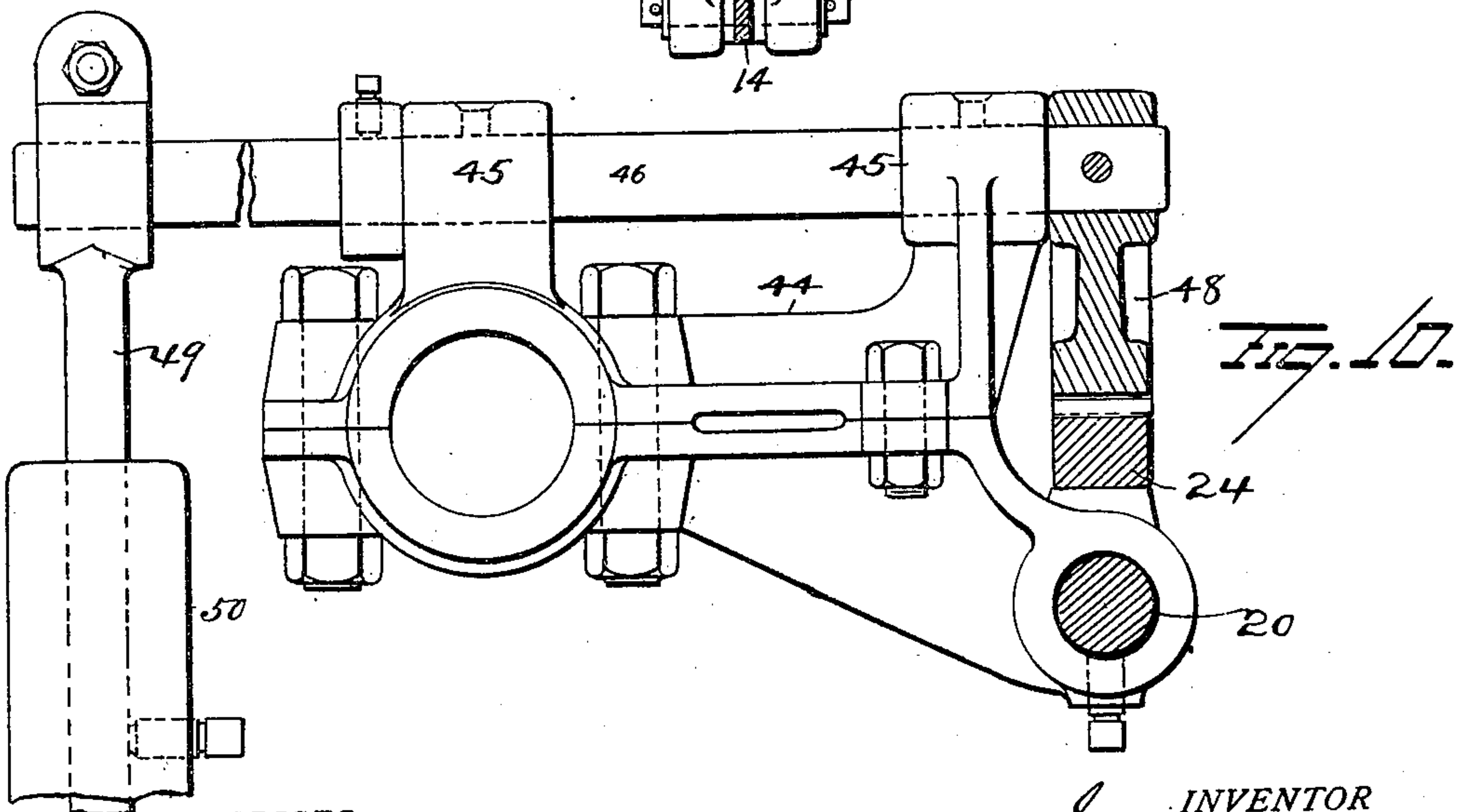
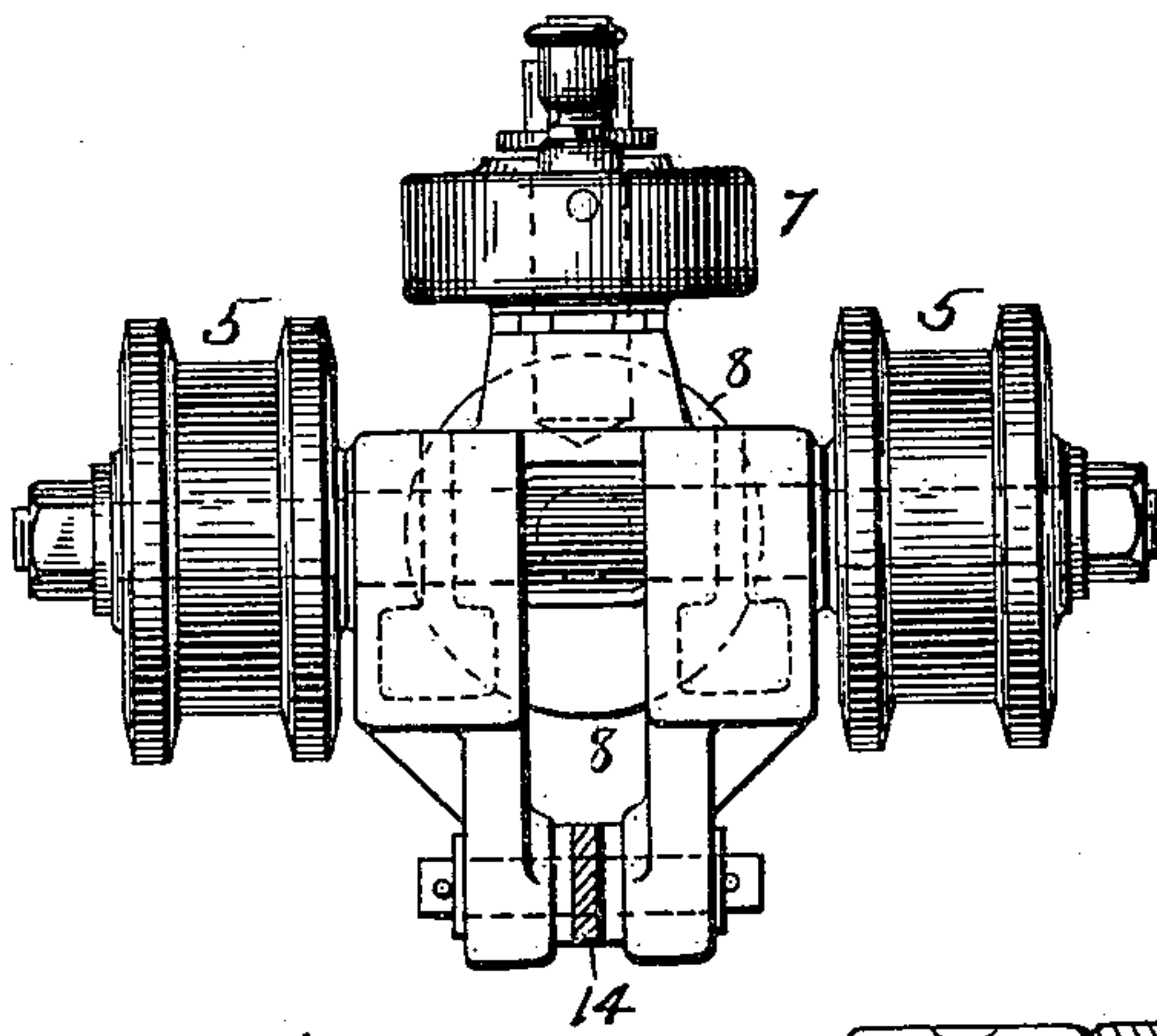
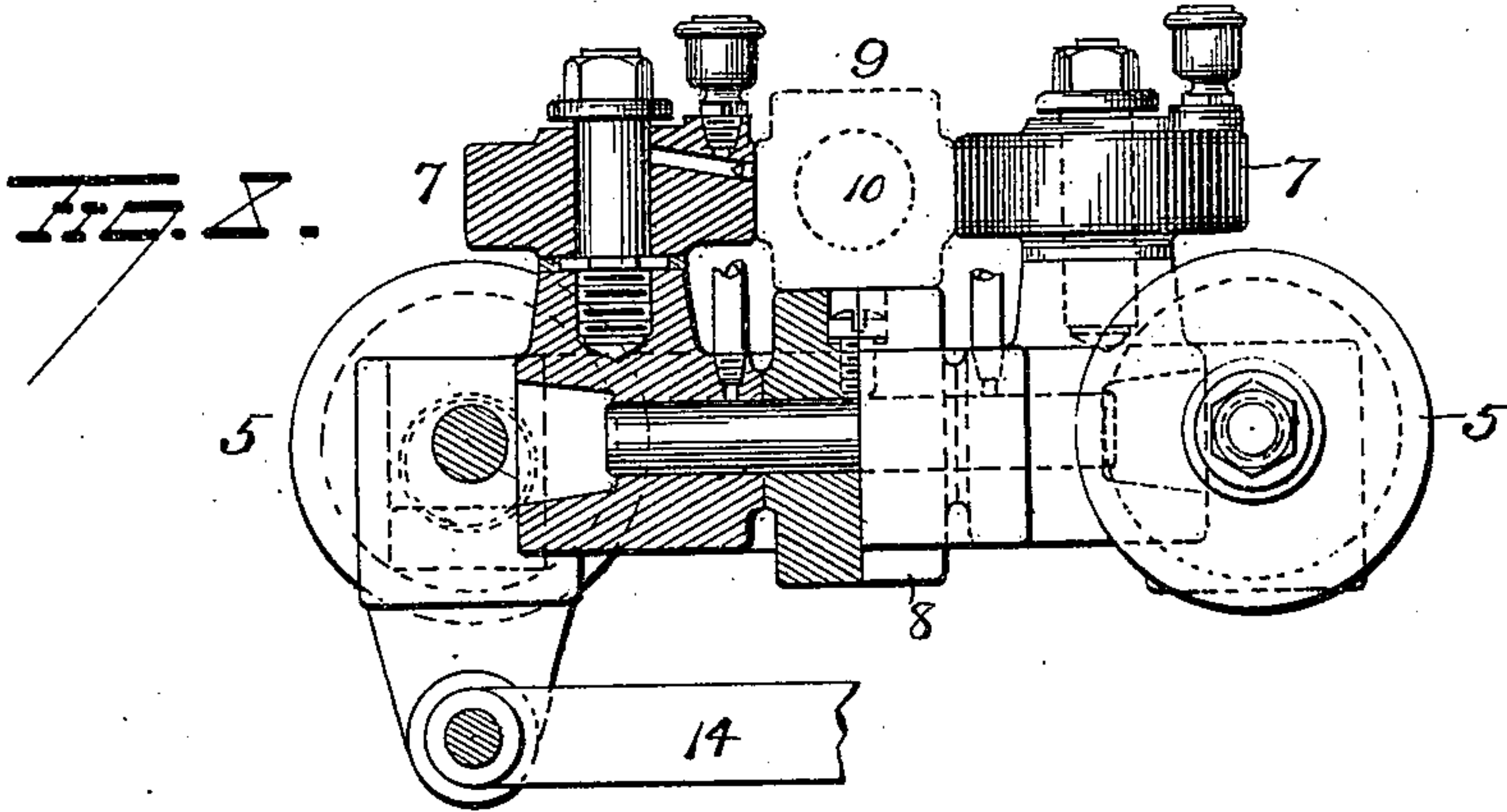
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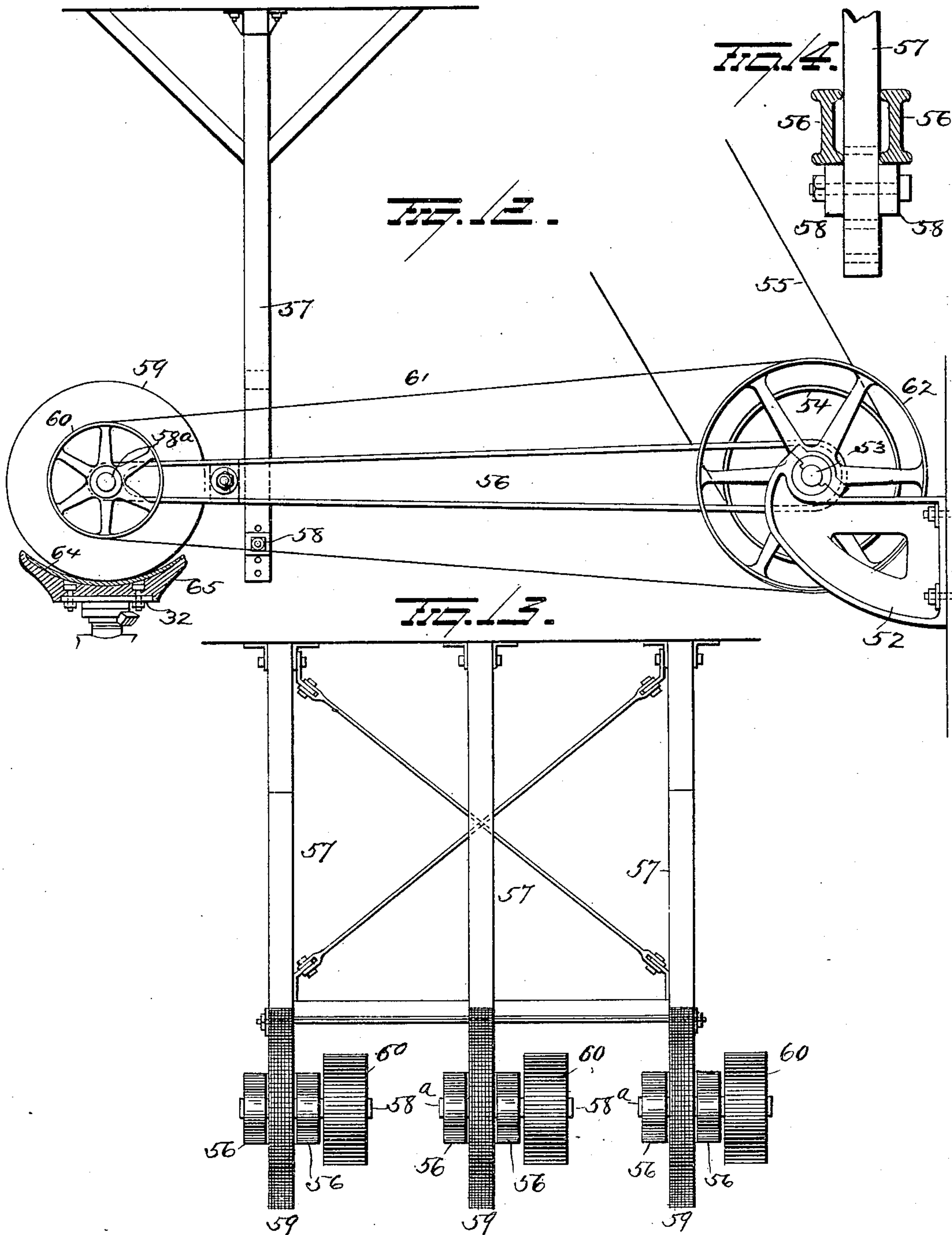
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6 Sheets—Sheet 6.



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UNITED STATES PATENT OFFICE.

SAMUEL DIESCHER, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO SOUTH BEND IRON WORKS, OF SOUTH BEND, INDIANA.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,865, dated July 23, 1901.

Application filed January 19, 1901. Serial No. 43,917. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL DIESCHER, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in grinding-machines, and more particularly to an apparatus for supporting and manipulating articles to be ground, the object of the invention being to provide a device of this character which will be under the control of an operator and which will simultaneously grind a number of articles, the movements of one manually-controlled article being communicated automatically to all of the rest.

A further object is to provide a machine of this character which will grind warped surfaces by means of grindstones, emery-wheels, or other agency capable of removing the scale of iron, steel, or any other castings, producing thereby a bright metallic surface.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view illustrating my improvements. Fig. 2 is a side view of the same. Fig. 3 is an end view. Figs. 4, 5, and 6 are enlarged detail views of the supporting mechanism. Figs. 7, 8, and 9 are enlarged detail views of the carriages. Figs. 10 and 11 are detail views of counterbalance mechanism, and Figs. 12, 13, and 14 are views of the grinding mechanism.

At each end of the machine trestle-work or upright frames 1 1 are located and each of which supports two parallel rails 3, the rails on one trestle or frame being parallel with those on the other, and are spaced apart sufficiently to accommodate a given number of face-plates and operating mechanism thereof. In the present instance I have shown three face-plates; but I may employ more than three or less than three, as the machine is

practically unlimited as to their number. A carriage or movable frame 4 is mounted on the rails 3 on each trestle 1, and is supported or carried by wheels 5 to run on the rails from end to end thereof, suitable stops 6 being provided at the ends of the rails to limit the movement of the carriages. The carriages 4 also carry horizontal rollers 7, spaced apart, and a vertical roller 8, disposed between the rollers 7 and slightly below them, and said rollers 7 and 8 bear against angular bearing-sleeves 9, which latter are elongated, and a shaft 10 is revolvably secured at its respective ends therein by collars 11, having set-screws for locking the collars against movement.

A shaft 12 is supported in bearings in the lower portions of the respective trestles and has secured thereon at its ends levers 13, which latter are connected at their free ends by links 14 with the carriages 4, so as to compel the carriages to move in unison and owing to the peculiar mounting of the bearing-sleeves 9 between the rollers 7 and 8 the shaft 10 is permitted to move longitudinally, and by means of the carriages 4 the shaft 10 can be moved laterally as well.

Secured at intervals on the shaft 10 are metal castings or frames 15, which are made with elongated bearings 16, secured to the shaft 10 by keys, as shown. In the present instance I have shown three of these frames; but it is obvious that more or less than three can be employed. Each frame 15 is made with uprights 18, having alined bearings therein for a shaft 19, and all of said frames are made with alined holes to receive a rod 20, secured to the frames by set-screws 21 to insure their simultaneous movement. Sleeves 22 are mounted on the shafts 19 between the uprights 18, and each sleeve 22 is provided on its under side with a gear-segment 23, meshing with a rack 24, mounted in alined notches or recesses in the frames, so as to transmit motion to all of said segments when one is operated.

Collars 25 are secured on the shafts 19 between one end of the sleeves 22 and one upright 18 by pins 26 and carry on their under side gear-segments 27, meshing with a rack 28, mounted in alined notches or recesses in

the frames, so as to transmit movement of one segment 27 to the others, and miter-gear segments 29 are provided on the upper sides of the collars 25 and mesh with miter-gear segments 30, secured by screws 31 with the face-plates 32, which latter are horizontally disposed and mounted to rotate on pintles 33, secured to and projecting up from the upper face of the sleeves 22.

10 The construction above described is common to all of the operating mechanisms; but one of them (in the present instance the central one) is slightly different from the rest, which difference will now be set forth in detail.

15 The sleeve 22 on the central mechanism is provided on one end with a semicircular flange or extension 34, which projects over the bearing on one upright 18 and is secured by bolts or screws 35 with an internally-screw-threaded ring 36, alining with the bearing in the uprights and through which the shaft 19 projects and is provided on its free end with a hand-wheel 37 for turning the shaft. A tube 38 is screwed into the ring 36 to secure it therein and surrounds the shaft 19, but does not project outward as far as the shaft, and has secured on its free end a hand-wheel 39, preferably larger than wheel 37, so as to permit the ready turning of said shaft and tube independent of each other to change the position of the face-plates.

Each frame 15 is provided with a socket 40, located on the opposite side of shaft 10 to the face-plate and has secured therein by set-screws 41 rods 42, on which weights 43 are mounted to counterbalance the weight of the frames and parts carried thereby.

Brackets 44 are secured on the shaft 10 and rod 20 between the frames 15 and are made with alined bearings 45 for shafts 46, on one end of which latter gear-segments 48 are secured and mesh with the rack 24, so as to be moved thereby, and on the other end of said shaft 46 depending arms or levers 49 are secured and carry at their free ends weights 50, which latter are adapted to hold the arms or levers 49 in a vertical position and will automatically return the face-plates to a horizontal position when the pressure on the hand-wheel 39 is removed.

The operation of my improvement is as follows: The articles to be ground are secured on the face-plates, and the emery or other grinding-wheels, which are located above the respective face-plates, are revolved. The operator grasps the hand-wheels 37 and 39 and is ready to begin the grinding operation. When he forces the hand-wheels to one side, the bearing-sleeves 9 will slide freely between the rollers 7 and 8, and the shaft 10 will carry with it all of the frames 15 and face-plates. When the operator forces the hand-wheels back or forward, the carriages will move freely on the rails 3 and carry with them the shaft 10 and face-plates. When the hand-wheel 37 is turned, the shaft 19 is turned,

and through the gear-segment 29, meshing with gear-segment 30, the central face-plate will be revolved, and this motion is transmitted to all of the face-plates by the segments 27 and rack 28, and when the hand-wheel 39 is turned the tube 38 and sleeve 22, connected therewith, are turned to incline or tilt the central face-plate, and this movement is transmitted to all of the face-plates by the segments 23 and rack 24. The movement of the latter moves segment 48 and turns shaft 46, and the weighted levers 49 will return the rack 24 and face-plates to their normal positions when the pressure on the hand-wheel is released. It will thus be seen that every motion which can be communicated to an article when held in the operator's hands can be communicated to the central face-plate by the hand-wheels 37 and 39, and such movement will be communicated to each and every one of the other face-plates by the mechanism above described, thus permitting a number of articles to be simultaneously and uniformly ground without danger to the operator and with a great saving of expense to the owner.

As an improved means for mounting the emery or other grinding wheels I employ the construction disclosed in Figs. 12, 13, and 14, in which 52 represents a wall-bracket supporting a shaft 53, on which a pulley 54 is secured and connected by a belt 55 with the engine. (Not shown.) Parallel I-irons 56 are pivotally supported at one end on the shaft 53, as many of said pairs of irons 56 being employed as there are grinding-wheels. Each pair of irons 56 are disposed on opposite sides of a vertical rod 57, depending from the ceiling and provided on opposite sides with stops 58 to support the irons 56 when the grinding-wheels are not in operation. A shaft 58 projects through the free ends of the irons 56 and has secured thereon between the irons an emery-wheel or other grinding-wheel 59 and also carries a pulley 60, and the pulleys 60 on the several shafts 58 are connected by belts 61 with pulleys 62 on the shaft 53. It will thus be seen that each grinding-wheel is supported independently of the others, so as to insure its engagement with the work to be ground, as clearly shown in Fig. 12, where the work 64 is shown supported in a mold 65 and the latter secured on a face-plate 32.

Various slight changes might be resorted to without departing from my invention, and hence I do not wish to limit myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope thereof.

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

1. The combination of a support for an article to be ground, and means constructed and adapted to move said support backward and

forward revolving and tilting the same and moving it sidewise while the work is in contact with a grinding wheel or device.

2. The combination of two supports for articles to be ground, means for moving one of said supports backward and forward, sidewise, and revolving and tilting the same while the work is in contact with a grinding device, and means for transmitting all of the movements of one of said supports to the other while the article carried thereby is in contact with a grinding device.

3. In a machine for supporting and manipulating articles to be ground, the combination with two supports or face-plates on which the articles to be ground are to be secured, of means connected with one face-plate for moving it in all directions and revolving it while the work is in contact with a grinding device so as to present the entire surface of the work to the grinding device and means for transmitting all of the said movements of said last-mentioned face-plate to the other.

4. In a machine for supporting and manipulating articles to be ground, the combination with a shaft mounted to move longitudinally and laterally, of two frames secured on said shaft, face-plates revolubly and pivotally supported on said frames, and means so connecting said face-plates that all of the movements given to one will be simultaneously transmitted to the other.

5. In a machine for supporting and manipulating articles to be ground, the combination with a shaft mounted to move longitudinally and laterally, of frames secured on said shaft, face-plates revolubly and pivotally supported on the frames, racks and gears connecting said face-plates so as to transmit the movements of one face-plate to the other, and means for revolving and tilting one of said face-plates and for moving the shaft longitudinally and laterally.

6. In a machine for supporting and manipulating articles to be ground, the combination with a frame mounted to move backward and forward and sidewise in either direction while the work is in contact with a grinding device, of a shaft supported in bearings in the frame, a sleeve on said shaft, a face-plate revolubly supported on the upper side of the sleeve, means for turning said sleeve so as to tilt the face-plate, and a gear on the shaft meshing with a gear on the face-plate so as to turn the latter when the shaft is turned.

7. In a machine for supporting and manipulating articles to be ground, the combination with a frame mounted to move backward and forward and sidewise in either direction, of a shaft revolubly supported in bearings in the frame and carrying a gear, a sleeve on said shaft, a pintle or pin on the upper side of the sleeve, a face-plate revolubly mounted on said pintle and carrying a gear meshing with the first-mentioned gear, and means for turning said sleeve and shaft independent of each other.

8. In a machine for supporting and manipulating articles to be ground, the combination with two tracks spaced apart, of carriages mounted to move on said tracks, bearing-sleeves mounted to move longitudinally thereof on the carriages, a shaft revolubly secured at its ends in the respective sleeves, a face-plate or support carried by the shaft and means for revolving and tilting said face-plate.

9. In a machine for supporting and manipulating articles to be ground, the combination with two parallel tracks spaced apart, of carriages mounted to run on said tracks, a vertical roller and horizontal rollers revolubly mounted on each carriage, bearing-sleeves having angular exteriors, supported between and adapted to engage all of said rollers and move thereon, a shaft revolubly secured at its ends in said bearing-sleeves, a face-plate or support mounted on the shaft, and means for revolving and tilting said face-plate.

10. In a machine for supporting and manipulating articles to be ground, the combination with two trestles or framework spaced apart and supporting tracks parallel to each other, of carriages mounted to run on said tracks, bearing-sleeves supported on the carriages and adapted to be moved longitudinally, a shaft revolubly secured at its ends in said sleeves, a face-plate or support carried by the shaft, means for tilting and revolving said face-plate, another shaft revolubly supported at its ends in the respective trestles, levers on the ends of said arms and links connecting the levers and carriages to compel the simultaneous movement of both carriages.

11. In a machine for supporting and manipulating articles to be ground, the combination with a shaft supported to move longitudinally and laterally, of frames secured on said shaft and spaced apart, shafts revolubly supported in bearings in the frames, sleeves on said shafts having gear-segments on their lower sides, a rack mounted to slide in the frames, in mesh with all of said segments, face-plates revolubly supported on the upper side of said sleeves and carrying gear-segments, collars secured on the shafts and carrying gear-segments on their upper side meshing with the last-mentioned gear-segments, gear-segments on the lower sides of said collars, a rack mounted to slide in the frames and meshing with all of said last-mentioned segments on the lower side of the collars, and means for turning said last-mentioned shaft and sleeve independent of each other.

12. In a machine for supporting and manipulating articles to be ground, the combination with a shaft mounted to move longitudinally and laterally, frames secured on said shaft and a rack mounted to slide on said frames, of sleeves on the frames having gear-segments thereon meshing with said rack, face-plates revolubly supported on said sleeves, means for turning said face-plates and sleeves, a bracket secured on said first-

mentioned shaft, a shaft revolubly supported
in said bracket, a gear on said shaft meshing
with the rack, and a weighted depending
lever secured on said last-mentioned shaft to
5 hold the rack in a position to maintain the
face-plates horizontal.

13. In a machine for supporting and ma-
nipulating articles to be ground, the combi-
nation with a shaft mounted to move longi-
10 tudinally and laterally, of frames secured on
said shaft and together, face-plates on said

frames, means for revolving and tilting said
face-plates, and weighted rods or levers for
counterbalancing the frames on the shaft.

In testimony whereof I have signed this 15
specification in the presence of two subscrib-
ing witnesses.

SAMUEL DIESCHER.

Witnesses:

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E. W. ARTHUR.