

A. L. DE LEEUW.

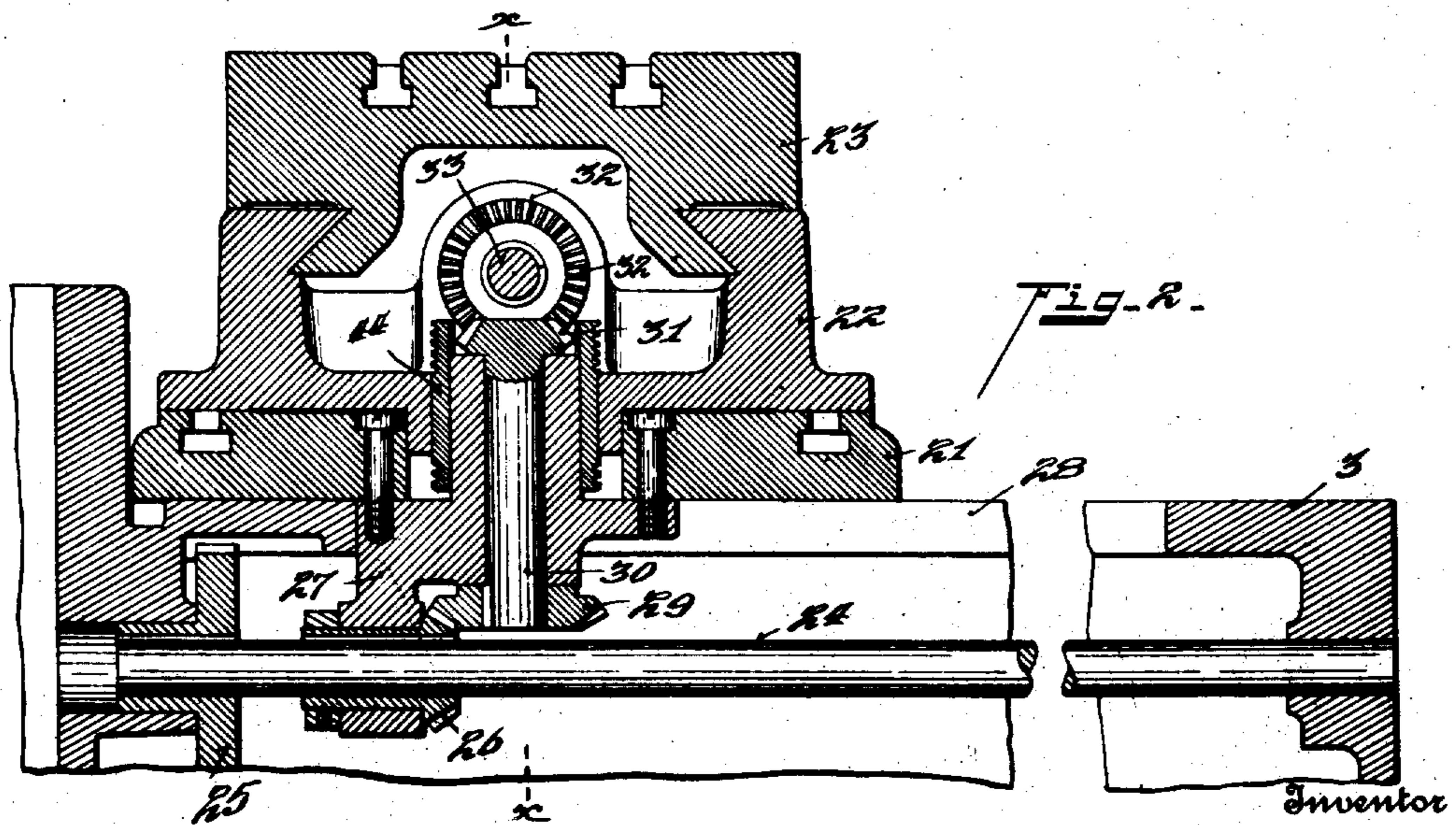
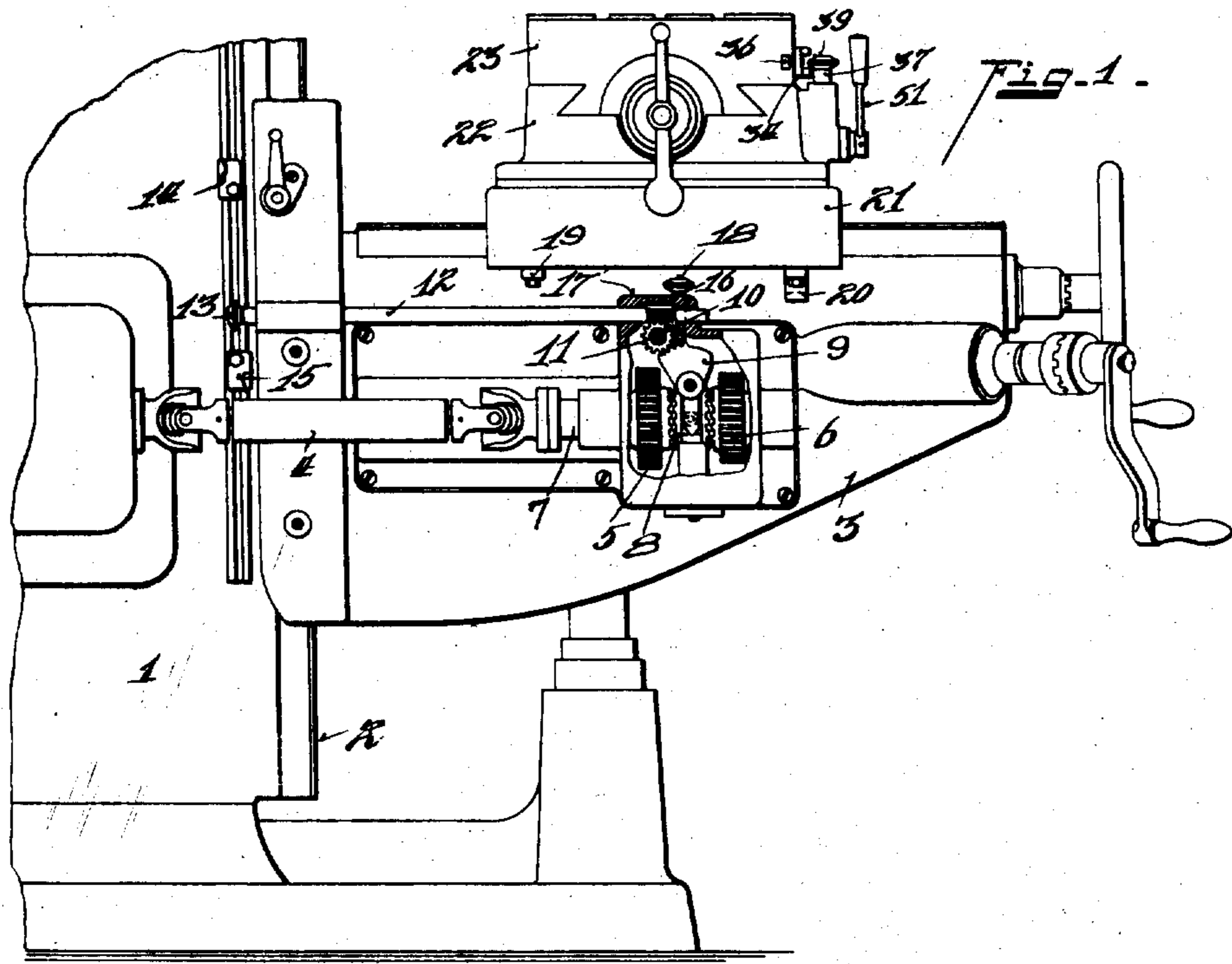
MILLING MACHINE.

APPLICATION FILED NOV. 13, 1909.

Patented Oct. 25, 1910.

973,766.

3 SHEETS-SHEET 1.



Witnesses

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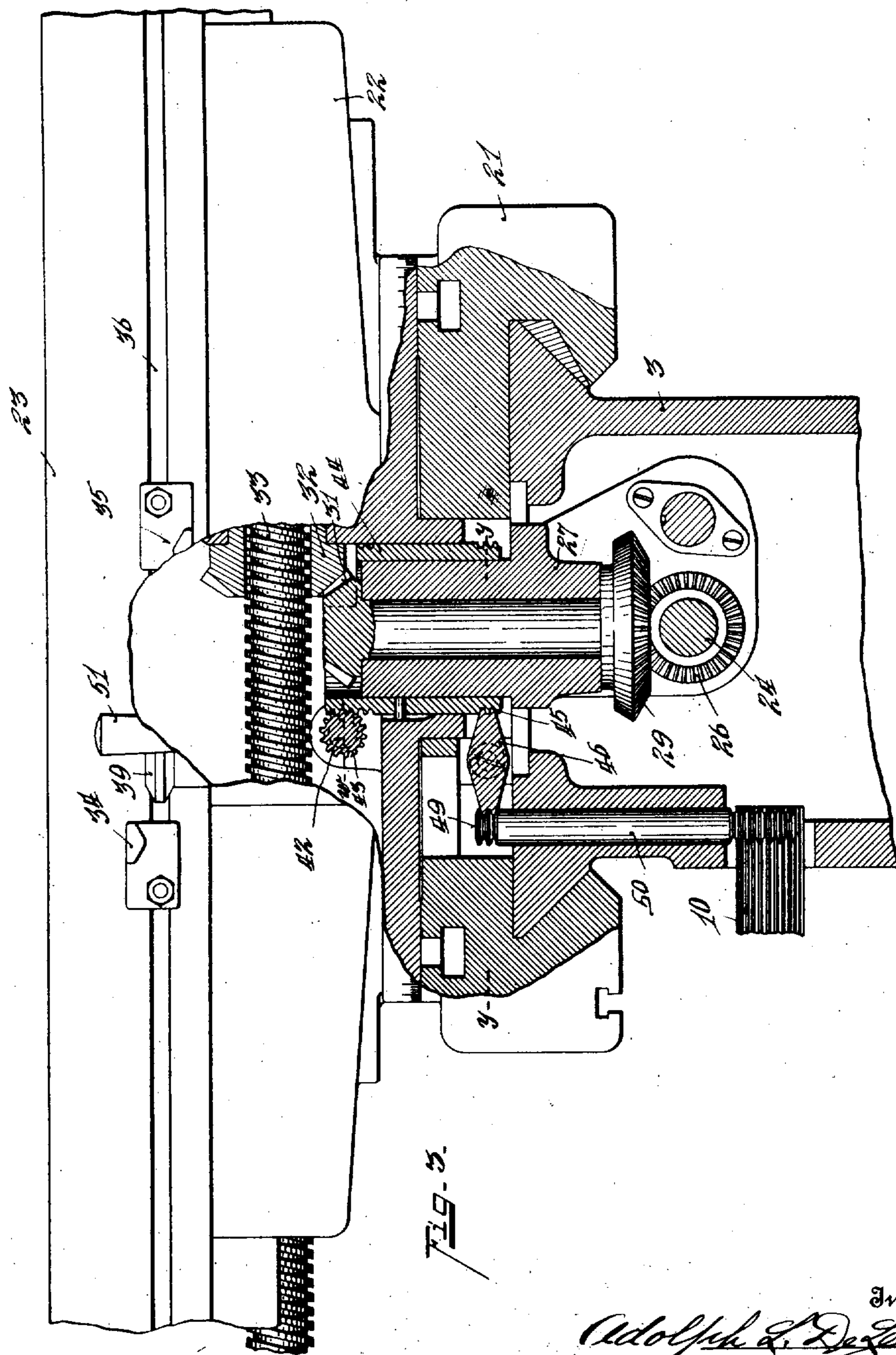


FIG. 3.

Witnesses

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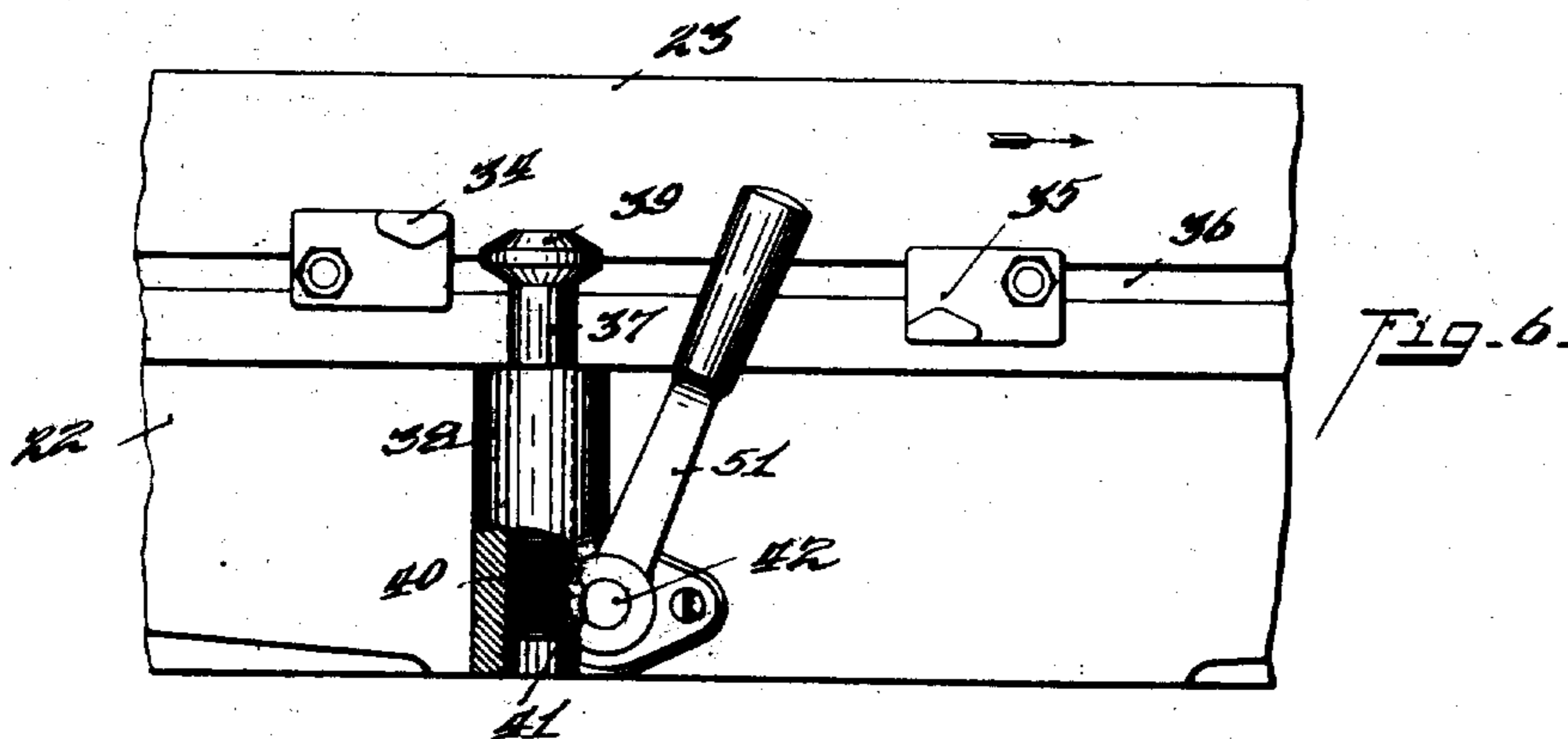
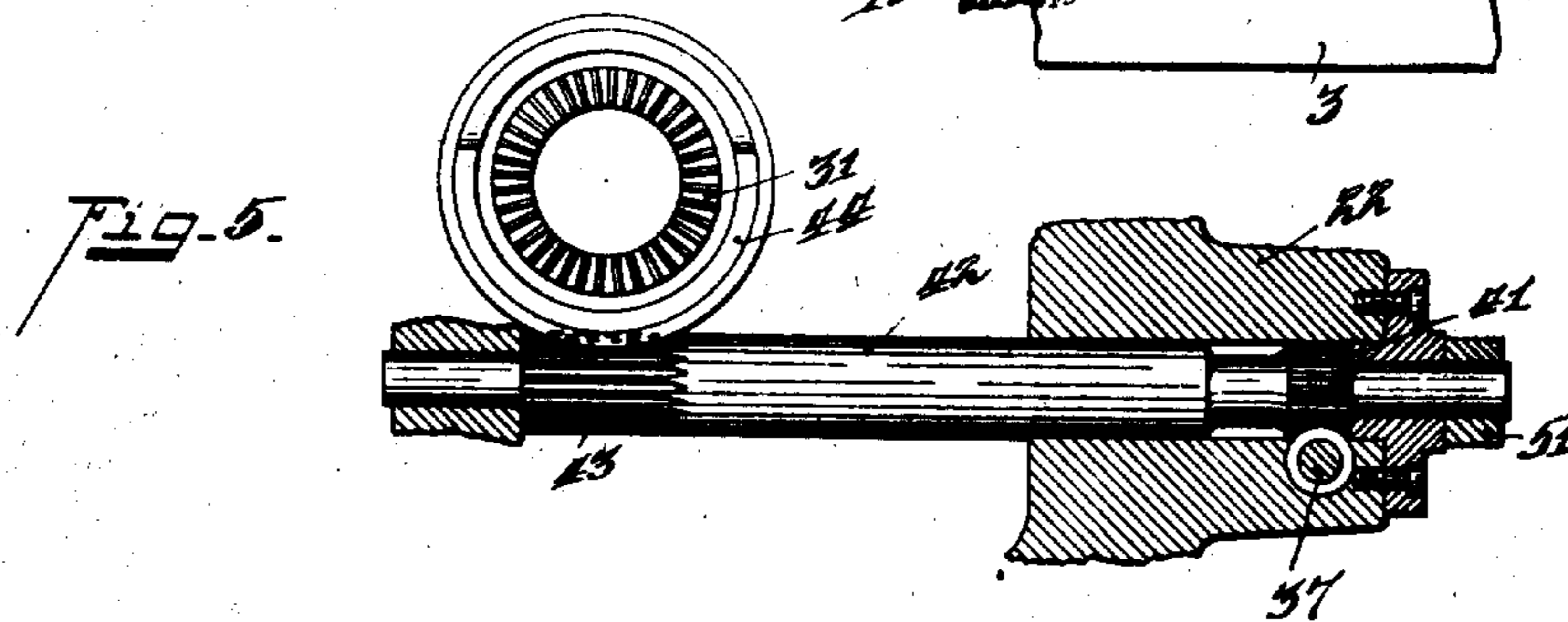
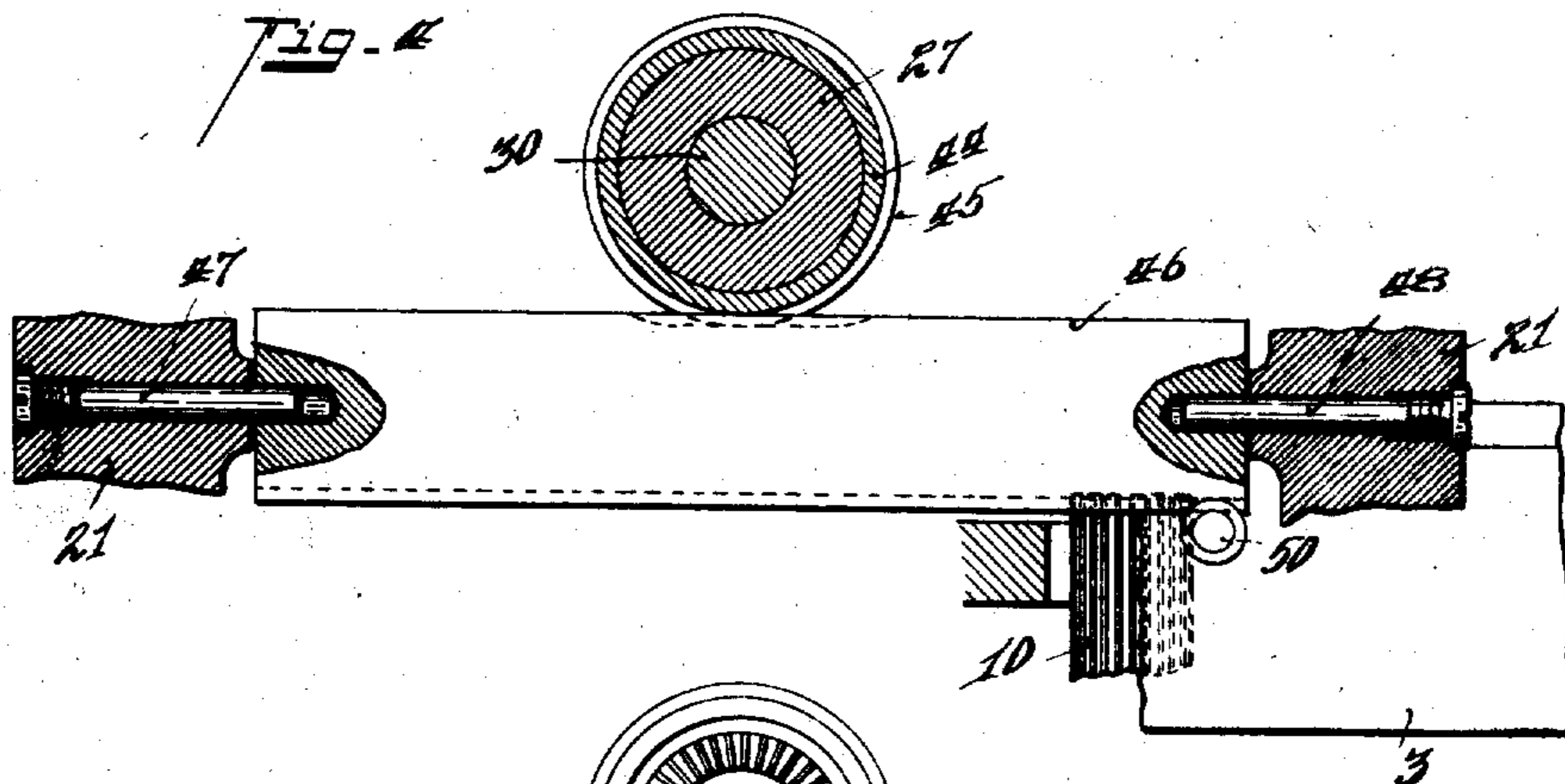
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3 SHEETS-SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

ADOLPH L. DE LEEUW, OF HAMILTON, OHIO, ASSIGNOR TO THE CINCINNATI MILLING MACHINE COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

MILLING-MACHINE.

973,766.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed November 13, 1909. Serial No. 527,964.

To all whom it may concern:

Be it known that I, ADOLPH L. DE LEEUW, a citizen of the United States, residing at Hamilton, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Milling-Machines, of which the following is a specification.

My invention relates to an improvement in milling machines, primarily to that type known as a universal machine.

The object of my invention is to provide means in the path of table travel of a universal milling machine, for automatically tripping the feeding devices governing the feed of the table, together with means for manually controlling the same.

The features of the invention are more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which:—

Figure 1 is a side elevation of a universal milling machine illustrating the knee and its contained parts and a portion of the frame. Fig. 2 is a central vertical section through the knee and its contained parts. Fig. 3 is a section on line *x, x*, Fig. 2, with the table shown in elevation. Fig. 4 is a section on line *y, y*, Fig. 3. Fig. 5 is a section on line *w, w*, Fig. 3. Fig. 6 is a front elevation of a portion of the table and carriage, illustrating the clutch tripping mechanism in the path of table travel.

1 represents the frame of a milling machine, provided with the usual slide-way 2, upon which the knee 3 travels. 4 represents the feed shaft in suitable driving connection with the main power devices, not shown, said shaft 4 being of universal form to permit the knee to be raised or lowered upon its slide-way. 5, 6, represent gears forming driving members for the various feed shafts for the vertical feeding of the knee and the horizontal feeding of the table. The gears 5, 6, are loose upon the shaft 7, and 8 represents a clutch member adapted to be alternately engaged with either one of the gears 5, 6, for engaging the same in driving relation with the shaft 7. 9 represents a clutch actuating lever pivotally mounted for shifting the clutch to control the engagements of gears 5, 6, with the shaft 7. Said clutch actuating lever is in the form of a sector, provided with rack teeth, adapted to engage an elongated pinion 10, carried by the stud shaft 11, suitably supported in the gear

housing fixed to the knee 3, as illustrated in Fig. 1. 12 represents a rod, provided with teeth, adapted to intermesh with the pinion 10 and slidably supported upon the knee 3, with its free end provided with a beveled head 13, adapted to engage the dogs 14, 15, adjustable in ways formed on the main frame 1, for automatically controlling the vertical feed of the knee 3. 16 represents a rod slidably mounted in the housing frame 17, provided with a beveled head 18 and rack teeth intermeshed with the pinion 10, for actuating the clutch member 9. Said beveled head is in the path of travel of the dogs 19, 20, adjustably mounted upon the saddle 21, horizontally movable upon the knee 3. These features for automatically controlling or tripping the feed for the knee and saddle are substantially the same as illustrated in a prior application filed by me and S. Einstein, jointly, October 23, 1907, Serial No. 398,720, but in which application the feed controlling mechanism was applied to a plain milling machine.

22 represents the carriage swiveled upon the saddle 21, for universally swinging the carriage and table relative to the cutting tool of the machine.

23 represents a table slidable upon the carriage. The knee is fed vertically by power and hand in any well-known manner, and the means for accomplishing said feed are therefore not illustrated in the drawings.

The feed of the table upon the carriage is accomplished as follows:—24 represents a shaft suitably journaled in the knee, see Fig. 2. 25 represents a gear in train with either one of the gears 5, 6, for producing a forward or reverse rotation of the shaft 24. 26 represents a beveled gear provided with an elongated sleeve journaled in the bracket support 27, depending from the medial portion of the saddle 21 and projected through a slot 28, formed in the knee 3. The gear 26 is splined to the shaft 24 and slidable thereon and movable with the saddle 21. 29 represents a beveled gear in mesh with beveled gear 26, fixed to the stud shaft 30, journaled in the bracket 27, and 31 represents a beveled gear fixed or formed integral with the shaft 30. The shaft 30 is concentric with the axis of adjustment of the carriage 22. 32 represents a beveled gear in mesh with the beveled gear 31, provided with a sleeve

journalled in a bearing formed in the carriage 22, see Fig. 3, and splined to the table feed screw 33, for horizontally feeding the table 23 upon the carriage. The table is provided with a depending nut, of the usual form of construction, engaged with the feed screw 33.

To automatically trip the drive by the travel of the table, the following instrumentalities are employed:—34, 35, represent dogs adjustable in the groove 36, formed on the front face of the table 23, see Figs. 3 and 6. 37 represents a rod slidably mounted in a bearing 38, formed on the carriage 22, provided with a beveled head 39 in the path of dog travel, adapted to be engaged thereby and actuate the rod 37 in a direction dependent upon which of the dogs it engages. The rod 37 is provided with rack teeth 40, intermeshed with a rack pinion 41, formed on the rod 42, journalled in the carriage, see Figs. 3, 5 and 6, with the opposite end of the rod provided with teeth 43, intermeshed with the teeth formed on the sleeve 44, loosely supported upon a sleeve bearing of the bracket 27, adapted to swivel thereon with the swiveling of the carriage 22, to which the sleeve 44 is splined, as illustrated in Fig. 3, and at the same time free to move vertically. The opposite end of the sleeve 44 is provided with rack teeth 45, intermeshed with a rock bar 46, pivotally supported within the saddle 21, by means of pins 47, 48, as illustrated in Fig. 4. This rock bar is of elongated form to accommodate the saddle and its contained parts to be adjusted upon the knee with the sleeve 44 maintained in constant connection with the rock bar 46 and moving therewith, while the opposite side of the rock bar 46 is provided with teeth extending the entire length thereof and intermeshed with the teeth 49 of the rod 50, slidably mounted in the knee 3, see Fig. 3, the opposite end of the rod being likewise provided with teeth intermeshing with the teeth of the elongated pinion 10, which, as before described, is in connection with the clutch actuating lever 9. Thus, as the trip bar 37 is moved upward or downward, according to which of the dogs 35 it engages, it will rock the rod 42, actuating sleeve 44, which in turn rocks the rock bar 46, thereby actuating rod 50, elongated gear 10, and the clutch lever 9, to shift the drive from forward to reverse, or vice versa, or stop the carriage feed. The trip rod 37 may be also shifted manually by means of the lever 51, fixed to the free end of rod 42, see Figs. 1, 5 and 6, enabling the feed to be controlled in a universal milling machine either automatically or manually from the forward position

or face of the table convenient to the operator.

By this construction it will be seen that the carriage can be swiveled upon its saddle and the feed controlling mechanism actuated in any position the carriage and table occupy relative to the saddle and in any adjusted position the parts occupy upon the knee.

Having described my invention, I claim:—

1. In a machine of the class described, a saddle, a carriage swiveled thereon, a table sliding on the carriage, a table driving shaft concentric relative to the swivel, feed mechanism between one end of the shaft and table, a clutch controlled feed mechanism connected to the other end of said shaft, a longitudinally movable and circumferentially toothed sleeve concentric to the swivel, tripping mechanism having connections between one end of the sleeve and the table and between the other end of the sleeve and the clutch.

2. In a machine of the class described, a knee, a saddle sliding thereon, a carriage swiveled on the saddle, a table sliding on the carriage, a clutch controlled primary feeding mechanism, tributary feeds to said saddle and table, the table feed having a driving shaft concentric to said swivel, a longitudinally movable and circumferentially toothed sleeve concentric to said table shaft, tripping mechanism between the table and support, having connections for moving said sleeve, a longitudinal plunger in the knee having connections with the clutch, and a rock bar having elongated toothed connection with said plunger and the sleeve, whereby the table can be tripped irrespective of its position of longitudinal and swiveled adjustment.

3. In a device of the class described, a knee, a saddle, feeding mechanism for reciprocating the saddle thereon, a feed control, a carriage swiveled on the saddle, a table slidable on the carriage, a trip, and devices on the carriage, adapted to positively reciprocate the trip by the reciprocation of the table, a member concentric with the carriage swivel, and devices connecting said concentric member with the trip and with the feed control, said concentric member being adapted to be reciprocated so as to automatically reverse the feed irrespective of the swiveled position of the table.

In testimony whereof, I have hereunto set my hand.

ADOLPH L. DE LEEUW.

Witnesses:

OLIVER B. KAISER,
EMMA SPENER.