No. 882,074. PATENTED MAR. 17, 1908.

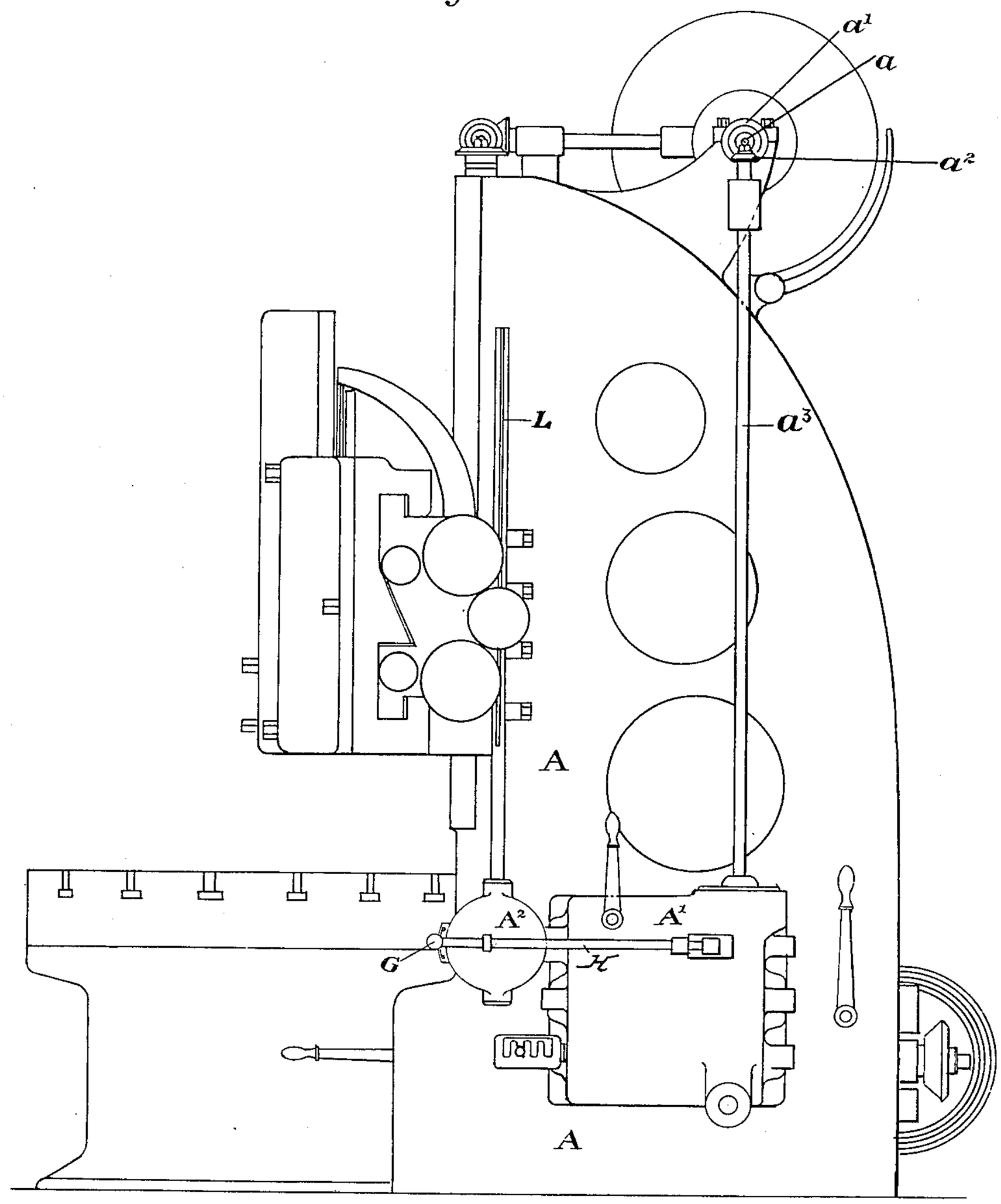
E. A. MULLER.

RAPID TRAVERSE MECHANISM.

APPLICATION FILED MAY 27, 1905.

3 SHEETS—SHEET 1.

Fig. 1



WITNESSES:

Chas. Hobart Jones

Joseph R. Gardner

INVENTOR

Edward A. Muller

BY Walter A. Knight.

ATTORNEY.

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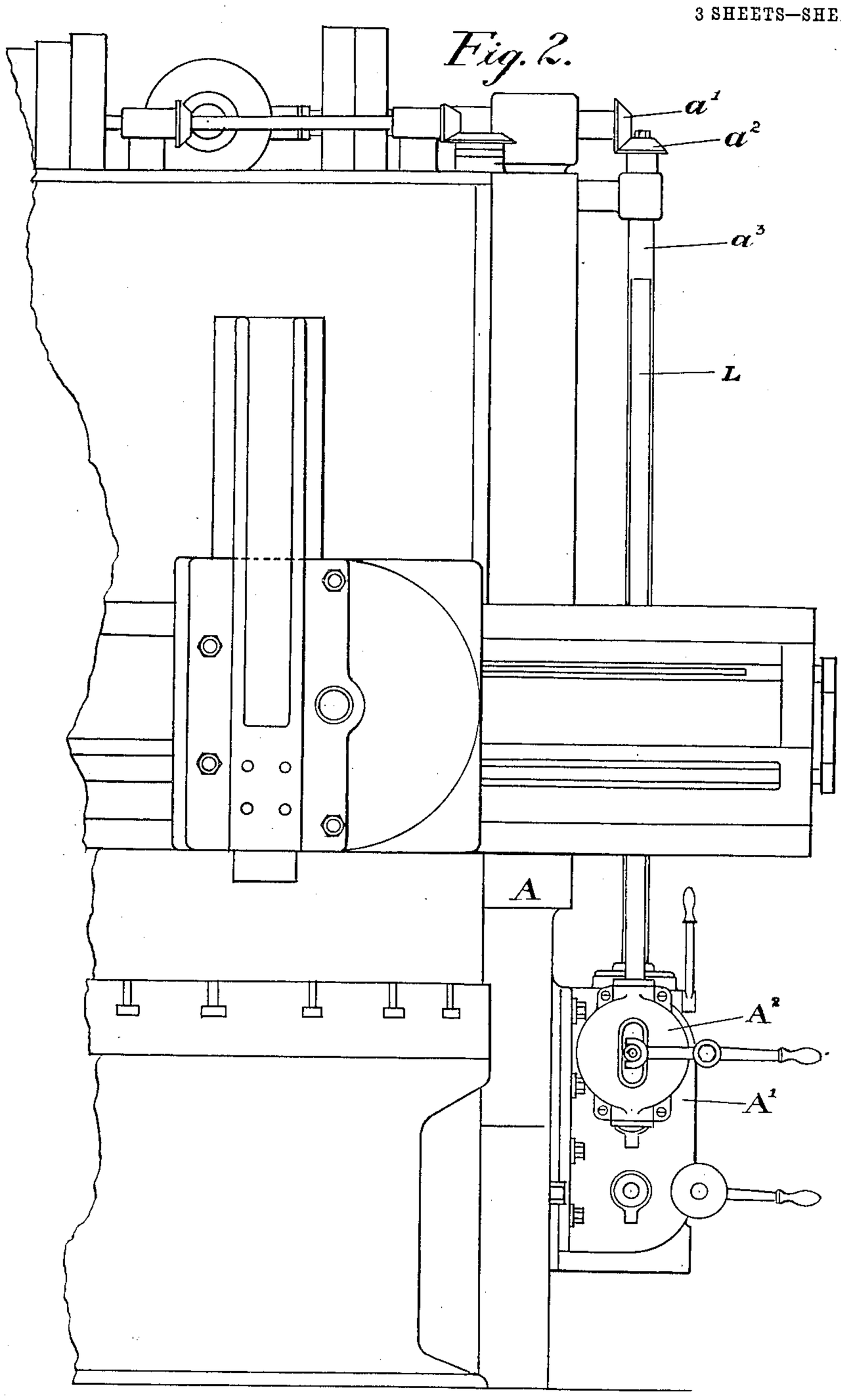
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig 3

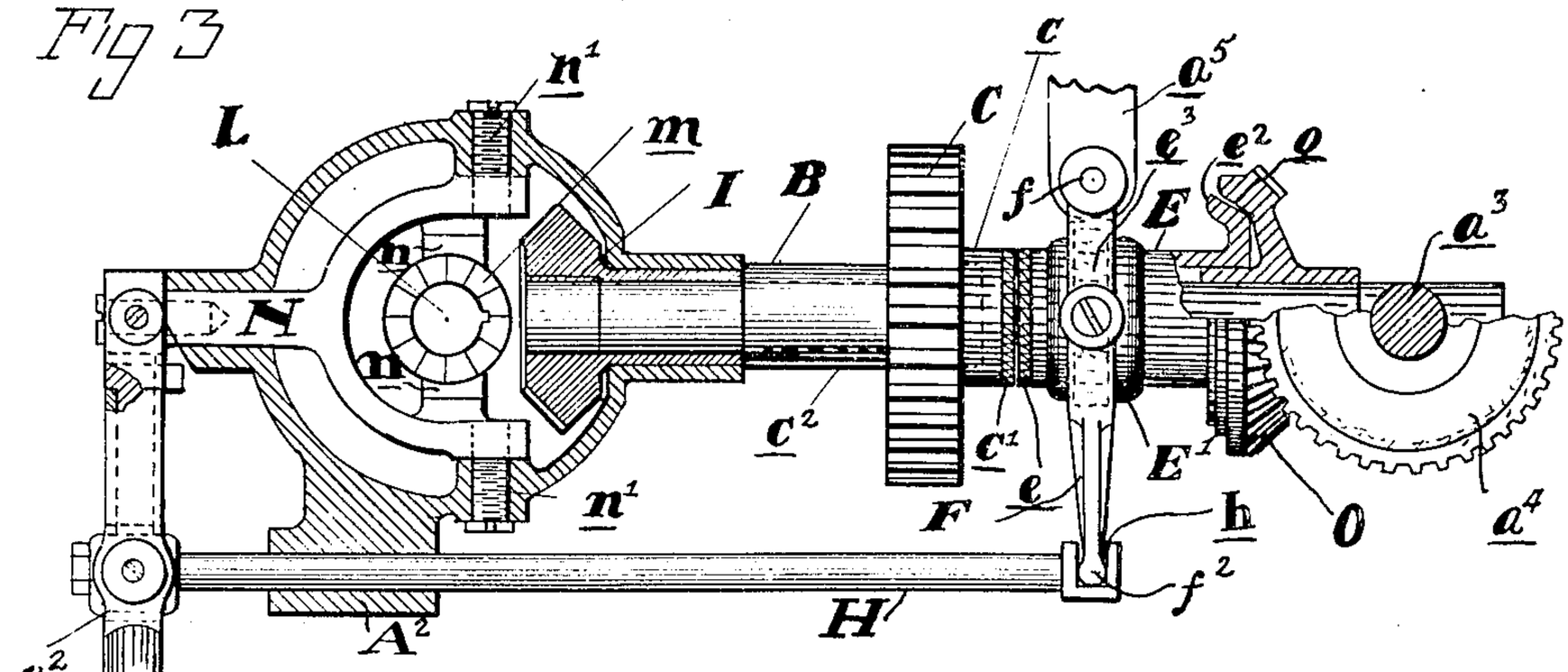


Fig 4

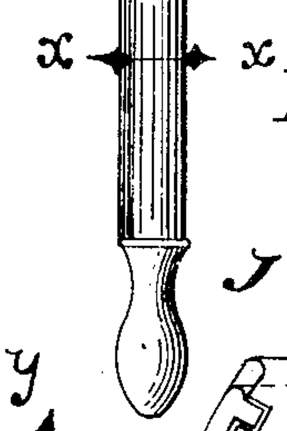


Fig 5

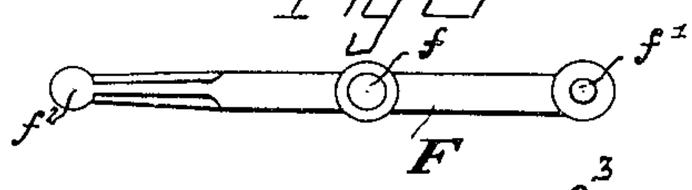


Fig 6

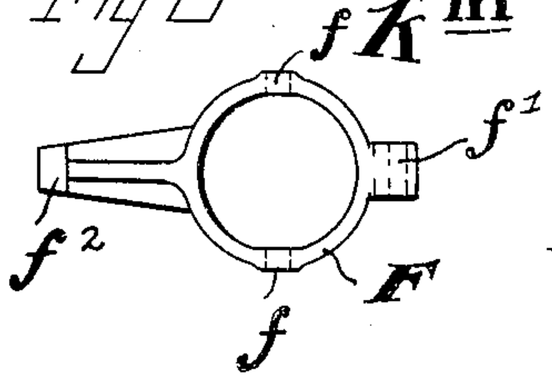


Fig 8

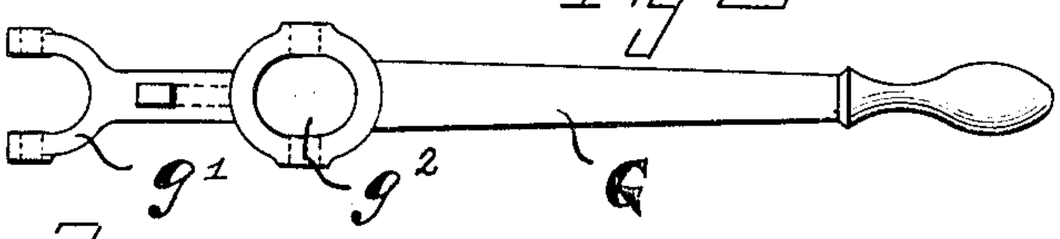
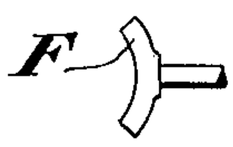


Fig 7



WITNESSES

Chas. Herbert Jones

Joseph R. Gardner

INVENTOR

Edward A. Muller

BY

Walter A. Knight.

ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD A. MULLER, OF MADISONVILLE, OHIO, ASSIGNOR TO THE KING MACHINE TOOL COMPANY, OF WINSTON PLACE, OHIO, A CORPORATION OF OHIO.

RAPID-TRAVERSE MECHANISM.

No. 882,074. Specification of Letters Patent. Patented March 17, 1908.

Application filed May 27, 1905. Serial No. 262,622.

To all whom it may concern:

Be it known that I, EDWARD A. MULLER, a citizen of the United States, residing at Madisonville, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Rapid-Traverse Mechanism, of which the following is a specification.

My invention relates to improvements in machine tools provided with rotating work table, and enables the operator to reverse the feed and also engage either the usual feed gearing or the rapid traverse connections, all by different movements of one lever. Heretofore two levers have been necessary to accomplish the same results, and my invention consists in the provision of means whereby there is added to the regular motion (usually vertical), of the reversing lever, another motion, (in that case horizontal), controlling the speed for working feed and the accelerated speed for rapid traverse, of saddles and tool-bars which hold the cutting tools.

In the particular embodiment of my invention selected for illustration my improvement is shown applied to a boring mill, representing which:—

Figure 1, is a side elevation. Fig. 2, is a front elevation with parts broken away. Fig. 3, is a plan view of my improvement with parts in section. Fig. 4, is a side elevation of my improvement partly in section and with parts broken away. Fig. 5, is a detail of the high speed clutch yoke as shown in Fig. 3. Fig. 6, is another view of same. Fig. 7, is one of the shoes for either clutch yoke. Fig. 8, is a plan view of the lever that operates both reversing and usual speed and rapid traverse mechanism.

Let, A, represent the machine frame, a, the counter-shaft mounted upon the same, provided with the usual pulleys, rotatively attached to said shaft; bevel gear, a^1, meshing with gear, a^2, rotatively attached to the vertical shaft, a^3, which extends into case, A^1, and terminates in the bevel gear a^4, rotatively attached to the inclosed end of, a^3. Gear, a^4, meshes with gear, O, which is normally loose on the shaft, B.

O, is a friction gear, held outwardly by collar or bearing (not shown). On the inner side its hub abuts the clutch sleeve and is thus held in place. The gear, O, has a suitable beveled inner rim, o, adapted to be frictionally engaged by a clutch.

Gear, C, also normally loose on shaft, B, has an elongated hub, c, provided with clutch teeth c^1, on the side next gear, O, and an elongated hub, c^2, collar or the like, to prevent gear, C, receding from possible contact with the clutch. Gears, O, and C, are held proper distances apart by sleeve, E, keyed to the shaft, B. Upon this sleeve, E, and splined to it is a clutch member, E^1, with teeth, e, adapted to engage with clutch, c^1, and friction gear, e^2, adapted to engage surface, o, of gear, O. Clutch, E, is provided with an annular groove, e^3, adapted to receive shoes, F^1, the shanks of which fit into holes, f, in the yoke, F, and turn freely to accommodate themselves to the changing position of the yoke, F, when clutch is being shifted.

Yoke, F, is pivoted at f^1, to any stationary part, as, a^5, a lug cast or attached to the inner wall of the case, A^1. At, f^2, yoke, F, is adapted to fit into a lateral recess, h, in the shifter rod, H. Lengthwise movement of rod, H, which pierces, case, A^2, for a guide is produced by motion of lever, G, in either of the directions indicated by the arrow, x, x.

Lever, G, is provided with the usual handle at the free end, a yoke, g^1, at the other end at a convenient point and an opening, g^2, adapted to receive the shaft, H, where a universal joint is provided. Lever, G, is made in two pieces jointed between g^1, and g^2, the cylindrical extensions of one part fitting into similarly bored extension of the other, so that free longitudinal and torsional movement is allowed.

When shifting clutch, E^1, lever G, is a lever of the second class, fulcrumed at g^1.

Shaft, B, extends from case, A^1, into case, A^2, where there is rotatively attached to it bevel gear, I. Bevel gears J, and K, normally loose on the shaft, L, through which the rail mechanism is actuated, are respectively provided with clutches, j and k, adapted to engage clutches, m, and m^1, respectively. Clutch, M, is also provided with an annular groove, m^2, adapted to receive yoke shoes, n, n, of the yoke, N, which is fulcrumed at n^1.

Lever, G, when used as a lever of the first class fulcrumed at g^2, and moved in either of the directions indicated by the arrow, y, y, shifts the clutch, M, through the yoke, N.

The operation of my invention is as follows: As shown in Fig. 4, movement of lever, G, downward causes clutch, m, to contact

with clutch, *j*, causing shaft, L, which communicates motion to feeding mechanism for saddles and tool-bars on cross-rails, to rotate to the left as indicated by the arrow, *v*, while movement in the opposite direction causes clutch m^1 to engage clutch, *k*, and causes shaft, L, to rotate to the right as shown by the arrow, *w*. As shown in Fig. 3, movement of the lever, G, to the right causes clutch, e^2, to engage friction clutch, *o*, of gear, O, securing rapid rotation of shaft, B, which movement is transmitted through gears, I, and J, or K, to shaft, L. Movement of lever, G, to the left causes clutch teeth, *e*, to engage clutch, c^1, securing motion through gear, C, to shaft, B, which is transmitted through gears, I; and J, or K, to shaft, L. Gear, O, gives constant and predetermined high rate of speed relieving the operator of the labor of traversing the heads by hand. Gear, C, receives motion from the differential feed gearing, (not shown), which gives the various rates of speed for the heads of the machine, which various rates of speed are necessary to adapt the machine to all classes of work within its capacity.

I claim as my invention and desire to secure by Letters Patent of the United States:—

1. The combination, with two inter-dependent shafts arranged one at right angles to the other and adapted to be geared together, said shafts being provided with clutches, a plurality of gears on each shaft, and actuating yokes for the clutches, of an operating lever, a shifter rod between said lever and one of the yokes, means forming a universal connection between one end of the rod and an intermediate portion of the lever, and means forming a universal connection on the other yoke and an end of said lever, whereby said lever is capable of swinging in two planes at right-angles to each other, in one plane to operate one of the yokes and in the other to operate the other yoke.

2. The combination with two inter-dependent shafts arranged one at right-angles to the other, a plurality of gears on each of said shafts, complementary clutch-mechanism between each shaft and its gear, yokes connected to the clutches, a shifter rod connected to one of the yokes, and a single lever, said lever being formed of two parts, a universal joint between one of the parts of the lever and one of the yokes and a universal joint between the other part of said lever and the shifter rod of the other yoke, whereby said lever is permitted to swing in two planes at right angles to each other, in one plane to operate one of the yokes and in the other plane to operate the shifter rod and the other yoke.

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

EDWARD A. MULLER.

Witnesses:
BURTON O. GREGG,
JOSEPH R. GARDNER