

No. 835,964.

PATENTED NOV. 13, 1906.

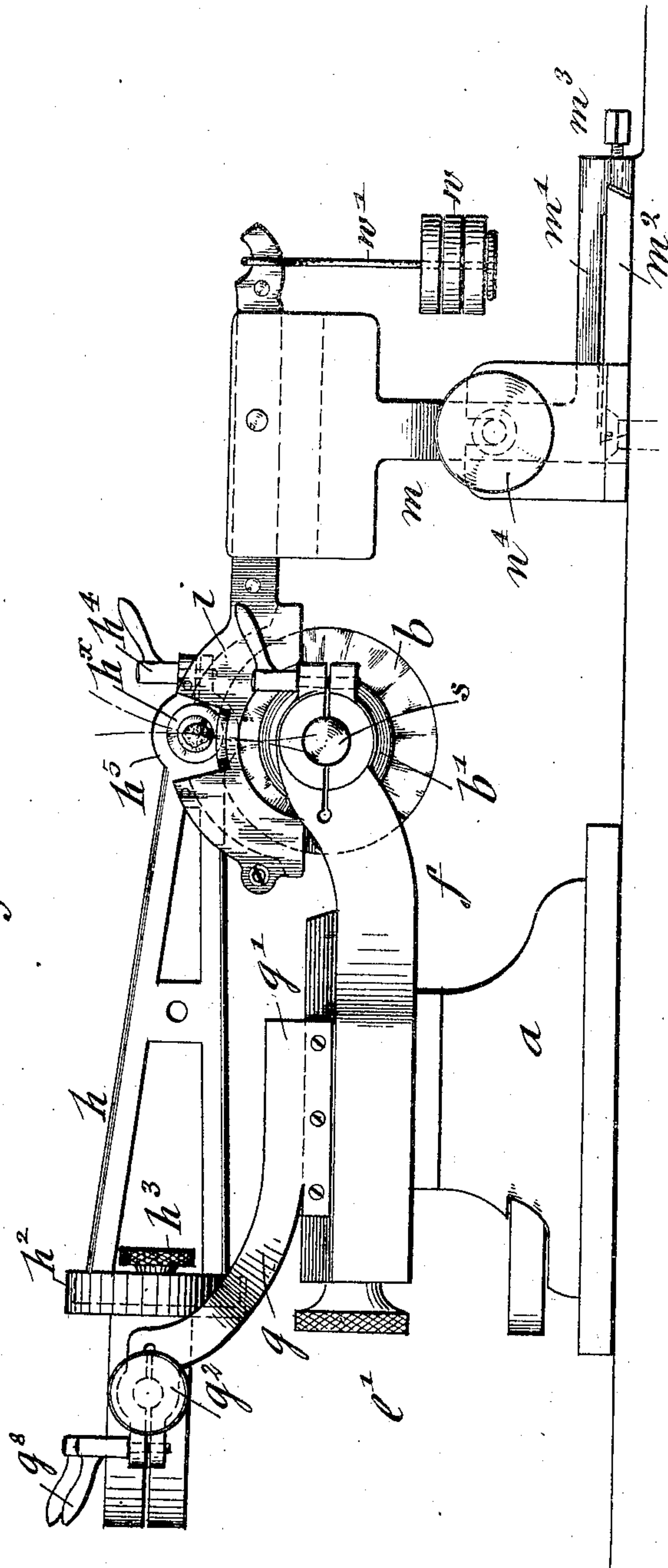
W. LOESSER.

MACHINE FOR SAWING DIAMONDS.

APPLICATION FILED JAN. 6, 1906. RENEWED SEPT. 29, 1906.

3 SHEETS—SHEET 1.

Fig: 1.



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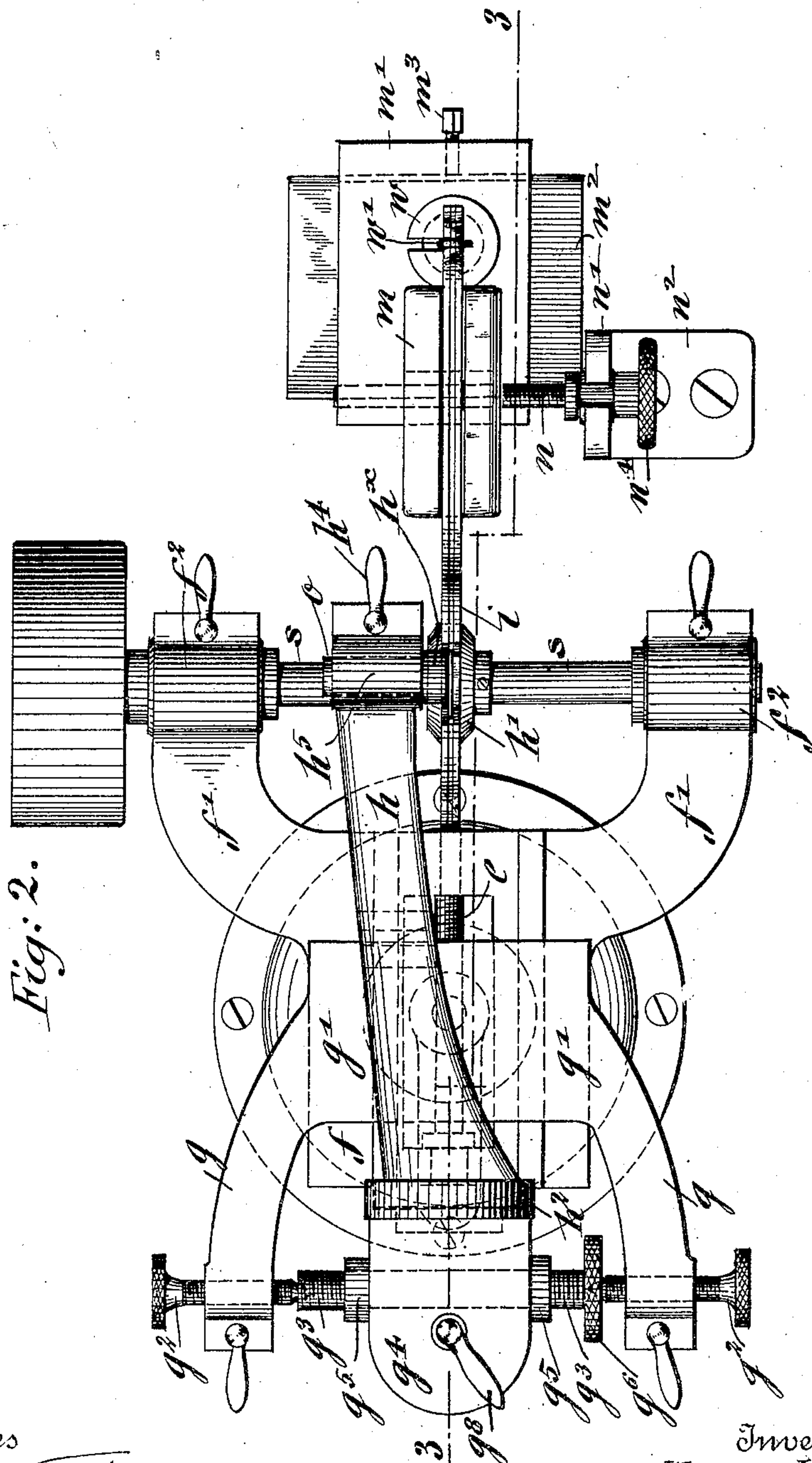


Fig: 2.

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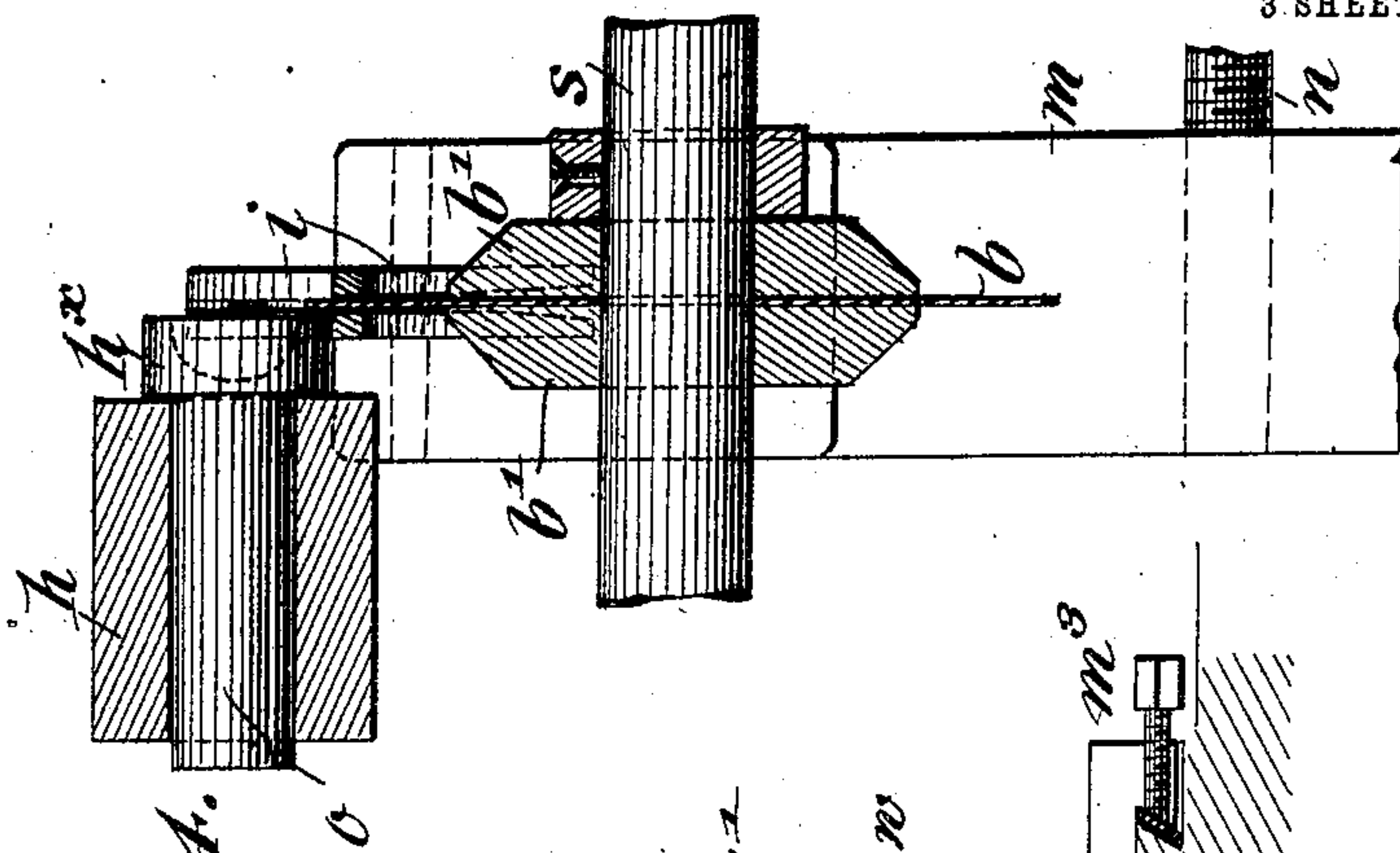


Fig. 4.

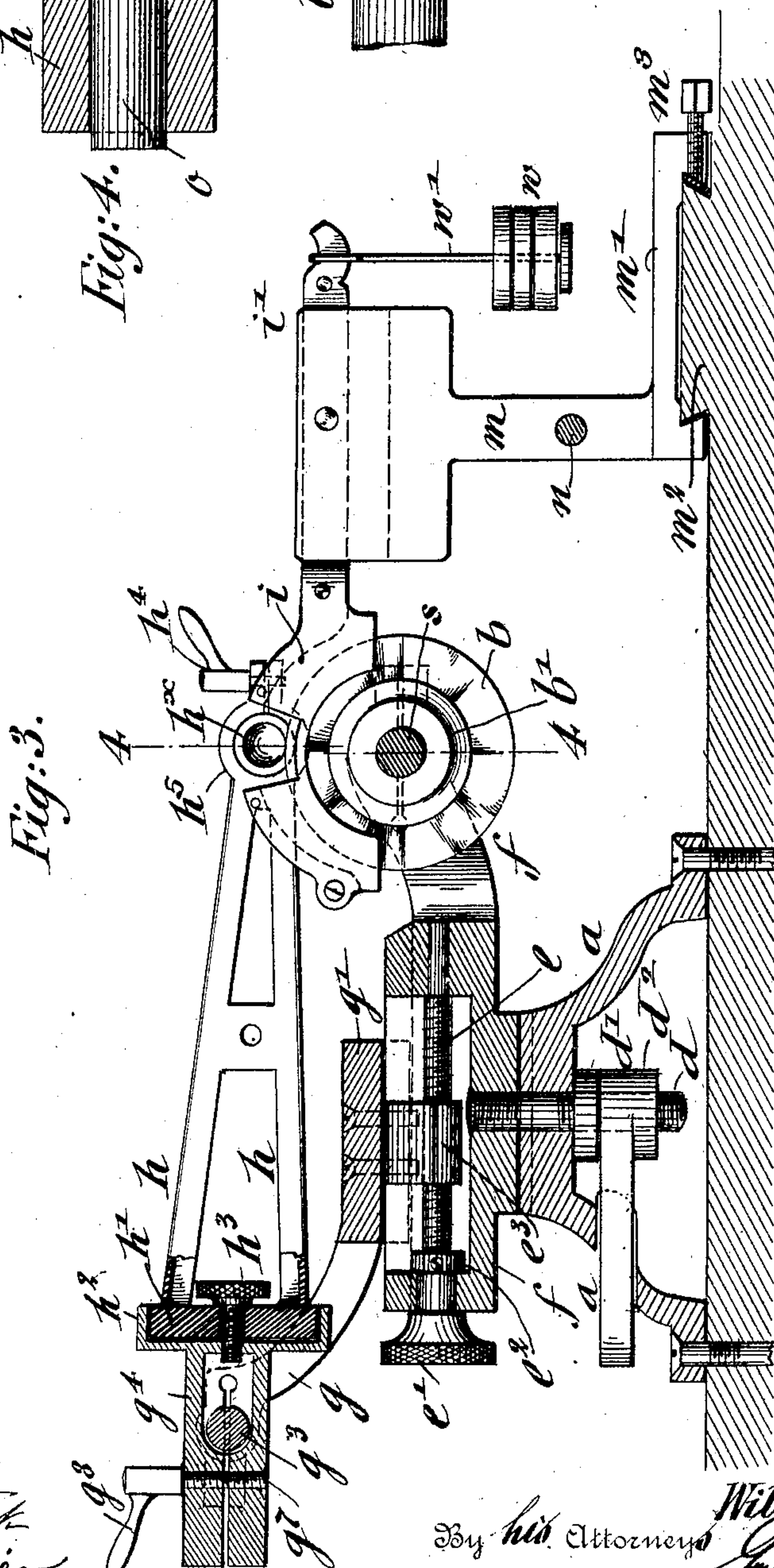


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SAWING DIAMONDS.

No. 835,964.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed January 6, 1906. Renewed September 29, 1906. Serial No. 336,803.

To all whom it may concern:

Be it known that I, WILLIAM LOESSER, a citizen of the United States, residing in New York, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Machines for Sawing Diamonds, of which the following is a specification.

This invention relates to certain improvements in machines for sawing diamonds, and more especially to means for guiding the thin disk by which the projecting portions of the rough diamonds are cut off; and the invention consists, mainly, in a machine for sawing diamonds, in combination with a rotary sawing-disk and means for guiding the saw-blade, so as to prevent vibrations of the thin saw-blade and give a steady even cut on the diamond.

The invention further consists of certain details of construction by means of which the guide for the saw-blade is adjusted and retained in proper position relatively to the rotary blade.

In the accompanying drawings, Figure 1 represents a side elevation of my improved machine for sawing diamonds. Fig. 2 is a plan view. Fig. 3 is a vertical longitudinal section on line 3 3, Fig. 2; and Fig. 4 is a vertical transverse section on line 4 4, Fig. 3, through the saw-blade and its guide drawn on a larger scale.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

Referring to the drawings, *a* represents a hollow base or pillar which is attached to a table or other suitable support. On the base or pillar *a* is mounted a horizontal frame *f*, which is made of rectangular shape at the portion immediately above said pillar and of fork shape at the projecting end, the ends of the fork *f'* being provided with journal-bearings *f²* for a shaft *s*, to which rotary motion is supplied by means of a suitable belt-and-pulley transmission. On the shaft *s* is mounted a thin saw-blade *b* of disk shape by means of disks *b'*, the hubs of which are attached to the shaft *s* by means of set-screws or otherwise. The rectangular portion of the horizontal frame *f* is clamped to the flat top of the pillar *a* by means of a clamping-screw *d*, which passes through holes in the rectangular portion of the frame *f* and the top of the pillar *a*, said clamping-screw being

enlarged at its upper end and being provided with a screw-thread for screwing into the rectangular portion of the frame *f* and with a screw-thread at the lower end for applying a screw-nut *d'* and jam-nut *d²* thereto, so that a rigid connection between the pillar *a* and the horizontal frame *f*, supported thereon, is obtained.

The rectangular portion of the frame *f* is provided with an oblong recess or depression, in which is arranged a screw-spindle *e*, which turns in suitable bearings of the raised or rim portions of the frame *f* and which is retained by a fixed collar *e²* in said bearings and provided with a knurled head *e'* at its outer end, so as to permit the convenient turning of said screw-spindle. On the threaded portion of the screw-spindle is adjusted a sleeve *e³*, which is attached to the rectangular end *g'* of a bracket *g*, which extends in opposite direction to the forked end of the frame *f* and is likewise made in the shape of a fork, so as to support in each end transverse horizontal set-screws *g²*, the inner conical tapering ends of which support a pivot-shaft *g³*, to which the split socket *g⁴* of the dop-holding arm *h* is attached. The set-screws *g²* are provided with knurled heads and are capable of adjustment in the ends of the forked bracket *g*, so as to permit the lateral adjustment of the supporting-shaft *g³*. This shaft is provided with an exterior screw-thread, on which are screwed home screw-nuts *g⁵* against the sides of the socket *g⁴*, so that the same is firmly held in position on the shaft *g³*. One end of the shaft *g³* is provided with a knurled head *g⁶* for permitting the tight setting of the screw-nuts by turning the threaded shaft *g³* on its axis. The split socket *g⁴* is firmly clamped to the shaft *g³* of a screw-bolt *g⁷*, which passes through the ends of the same and which is provided with a short thumb-lever *g⁸* for operating the same. The supporting-arm *h* of the dop-holder is secured by a disk-shaped portion *h'* into the circular seat *h²* of the member *g⁴* and firmly secured by a clamp-screw *h³*, as shown in Fig. 3. The arm is placed at a slight angle to the longitudinal center plane of the machine, which passes through the disk-shaped saw-blade, so that the shank of the dop *o* can be inserted into the split end or head *h⁵* of the supporting-arm *h* and firmly clamped thereto by a clamping-screw *h⁴*, which is provided with a short thumb-lever for conveniently operating the same. The diamond is inserted

by means of aluminium or other suitable material into the head h^x of the dop in such a manner that the part to be sawed off projects from the head of the dop and over the edge of the disk-shaped blade b .

The machine above described is well known and forms no part of my invention. It was found by practical tests that the thin saw-blades, which are made of bronze-steel, vibrated slightly during the cutting action, so that only blades of a certain degree of thickness could be used. This caused sometimes uneven sawing of the projecting portions of the diamond and loss, for the reason that very thin blades could not be used for sawing diamonds. To overcome this defect and to bring the sawing operation into better control and permit the use of thinner saw-blades, a guide i for the upper part of the saw-blade is employed, which guide is formed of two parallel pieces of hardened steel that are connected by transverse pins at such a distance from each other that the saw-blade can rotate freely between the semicircular end of the guide. The guide is recessed at its upper middle portion, so as to give sufficient play for the head h^x of the dop and leave only a small portion of the circumference immediately adjacent to the lower part of the diamond free for the sawing action, while the upper remaining portion of the upper half of the saw-blade is supported by the two sections or plates of the guide i . The lower edge of the recess in the guide-plate i is held in contact with the head of the dop by means of a counterweight w , which is suspended from the outer end of the shank i' of the guide i by means of a rod w' , having a disk-shaped lower end on which the weight rests and a hook-shaped upper end that is set into the recess of the shank. The shank is fulcrumed to an upright support m , the base m' of which is adjusted by means of a dovetail groove, on a dovetail guide-piece m^2 of the supporting-table and screwed in position by means of a set-screw m^3 . An adjusting-spindle n , which turns in a recessed ear n' of a plate n^2 , that is attached to the supporting-table, is adjusted, by means of its knurled head n^4 , so as to move the dovetailed base m' laterally on the guide-piece m^2 and bring thereby the space between the guide-plate i into proper vertical plane with the rotary saw-blade b by the counterbalancing-weight w . The edges of the recessed guide-plate i are held in proper contact with the projecting

portion of the dop, so that the small segmental portion of the saw-blade which projects above the same can exert its sawing action on the projecting portion of the diamond without vibration or "wabbling," so that a perfectly clear cut is produced, while at the same time thinner saw-blades than heretofore can be used, and thereby a more perfect, reliable, and economical cutting action on the diamond obtained. By this construction the lateral turning of the saw-blade in the kerf is also prevented, and the counterweight reliably supports the dop-holding arm. The walls of the guide are hardened and so arranged with respect to the saw that the latter can move in only one plane—viz., it is forced to run true.

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

1. In a machine for sawing diamonds, the combination with the dop-holder, the dop, and rotary saw-blade, of a guide for the upper part of the saw-blade disposed below the head of the dop.

2. In a machine for sawing diamonds, the combination with the dop-holder, dop, and rotary saw-blade, of a guide for the upper part of the saw-blade below the head of the dop, said guide being composed of two guide-plates provided with a recess receiving the head of the dop.

3. In a machine for sawing diamonds, the combination with the dop-holder, dop, and rotary saw-blade, of a guide for the upper part of the saw-blade disposed below the head of the dop, said guide being provided with a counterweight for being held in contact with the head of the dop during the sawing operation.

4. In a machine for sawing diamonds, the combination with the dop-holder and dop in the same, of a rotary saw-blade below the head of the dop, a guide provided with a recess, the shank of the guide being fulcrumed and counterweighted, a support for the shank of the guide, and means for laterally adjusting said support.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WILLIAM LOESSER.

Witnesses:

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