Feb. 24, 1931. H. H. ASBRIDGE 1,794,271

GRINDING MACHINE

Filed Jan. 28, 1929

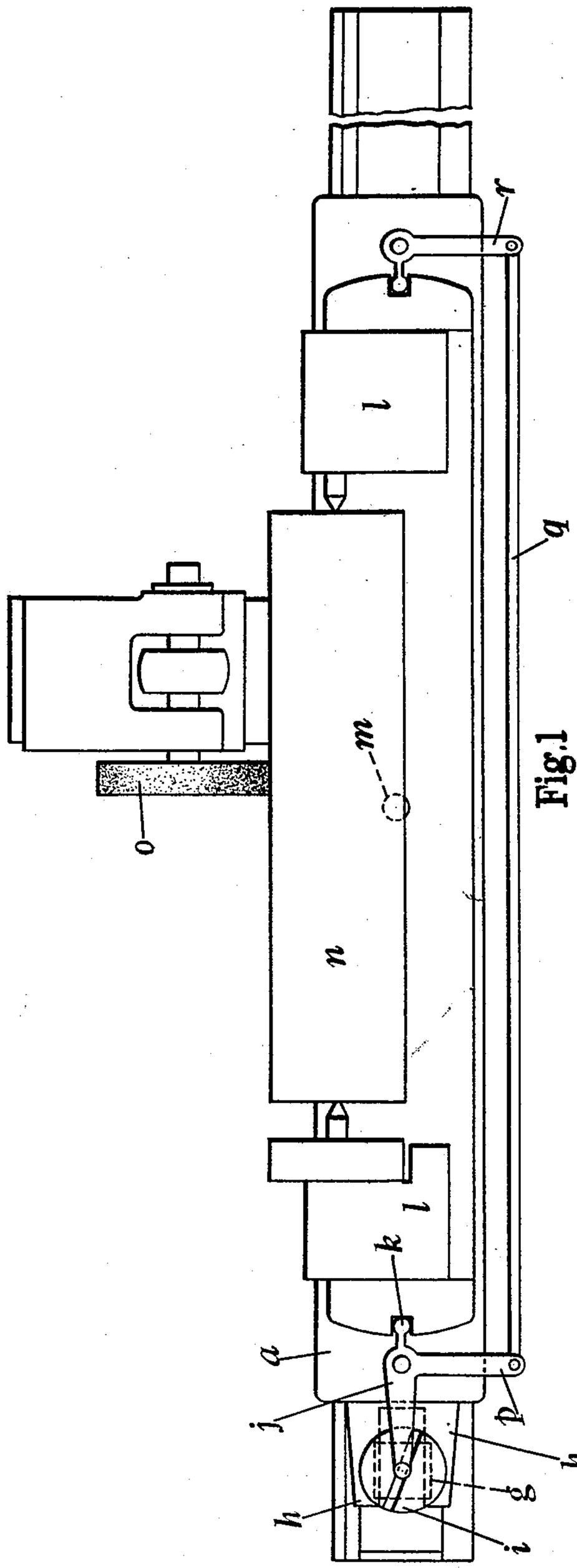


Fig.1

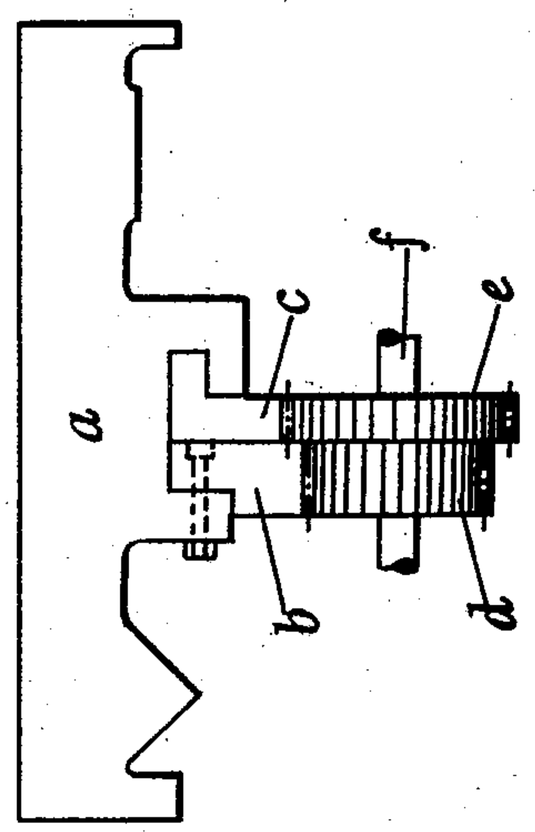


Fig.3

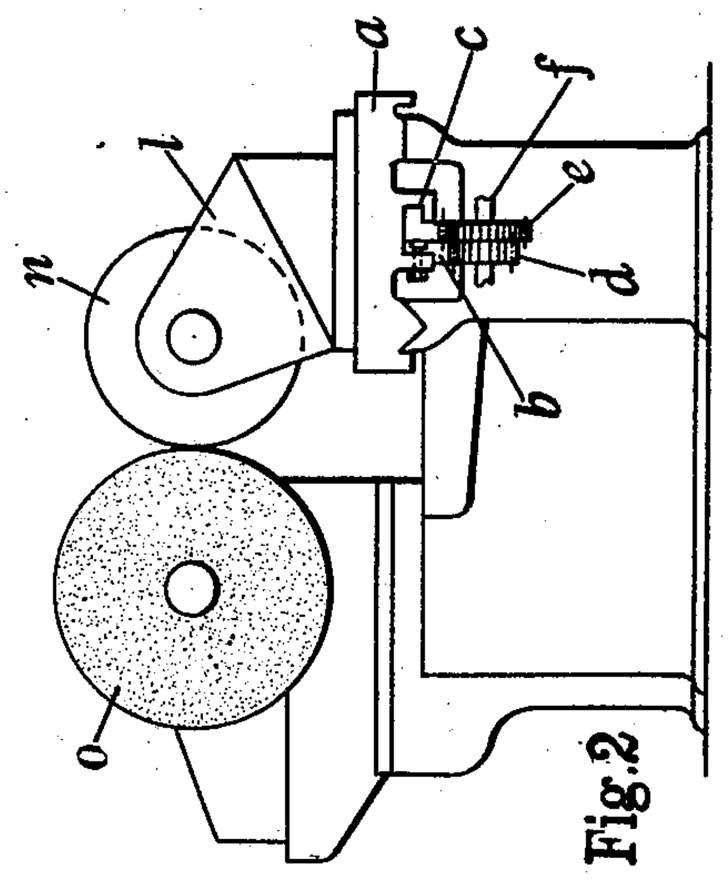


Fig.2

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UNITED STATES PATENT OFFICE

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GRINDING MACHINE

Application filed January 28, 1929, Serial No. 335,701, and in Great Britain February 29, 1928.

This invention relates to grinding machines, particularly of the type employed for the circular grinding of rolls for rolling mills or for calendering and like machines. The said rolls may require to be finished with either a parallel, a convex or a concave surface and the grinding machines for such finishing are, in known practice, provided with a grinding wheel in a relatively fixed position whilst the roll is carried on a swivelling member mounted on a reciprocating table.

The object of this invention is to provide improved means for effecting the swivelling of the roll or work support and for the ready and reliable variation of the amount and direction of such swivelling to suit varying requirements.

The invention comprises the improved combinations and arrangements of parts hereinafter described and claimed.

Referring to the accompanying sheet of explanatory drawings:—

Figure 1 is a plan and Figure 2 an end view representing in diagrammatic form or outline a roll grinding machine with this invention applied thereto.

Figure 3 is an end view showing the rack mechanism to a larger scale than that of Figures 1 and 2.

Like reference letters in the different views indicate like parts.

In the application of the invention as illustrated by the drawings, there is provided beneath the reciprocating table *a* of the machine a rack *b* which is fixed to said table and an auxiliary rack *c* which is capable of a sliding movement relatively to said table. The said racks are respectively in mesh with pinions *d* and *e* having different numbers of teeth thereon which are preferably formed integrally with each other and mounted on the shaft *f*. Attached to one end of the auxiliary sliding rack *c* is a block *g* (shown at the left hand end of Figure 1) adapted to slide in the guide-ways *h* of the table *a*. The said block *g* has arranged therewith a grooved disc *i* capable of being set with its groove either parallel or in alignment with the longitudinal centre line of the table *a* or at an angle thereto. In the illustration (Figure 1), the groove is shown set at an angle.

The groove of the disc *i* is engaged by one end of the lever *j* which has its pivot or fulcrum on the table *a*. The opposite end (*k*) of said lever engages one end of the work support *l* carried by the table *a* and capable of a swivelling movement about a centre as *m*.

As the table *a* is reciprocated, the auxiliary or sliding rack *c* imparts to the block *g* a sliding movement at a rate differing from the rate of the table movement. In the example illustrated the rate of movement of the block *g* will exceed that of the table because the pinion *e* has a larger number of teeth than the pinion *d*. With the grooved disc *i* set at an angle to the line of travel of the table *a*, as indicated at Figure 1, the end of the lever *j* engaged in the groove will have a corresponding angular movement about its pivot. The end *k* of the said lever will therefore operate the swivelling work support *l* so that the roll *n* or the work mounted upon said support and rotated in any convenient and ordinary manner in contact with the grinding wheel *o*, will have a spherical contour imparted to it, either convex or concave, depending on the angle to which the groove of the disc *i* may be set.

For the correct movement of both ends of the swivelling work support *l* (which may be of considerable length) and the prevention of lag or lost motion due to bending or other stresses, the lever *j* has an extension or bell crank arm *p* which is connected by the rod *q* to the lever *r* at the opposite end of the swivelling support *l*.

When the reciprocatory table *a* is operated otherwise than through rack and pinion mechanism, as for example by a screw and nut device or by hydraulic power mechanism, the grooved disc *i* with associated parts for effecting the swivelling movements of the work support *l* are arranged therewith in any convenient manner.

What I claim is:—

1. In roll grinding machines, in combination, a grinding wheel, a slide reciprocable

upon the machine bed, a roll support swivelling about a vertical pivot upon said slide, guide ways in an extension of said slide, a block reciprocable in said guide ways, and means for its reciprocation relatively to the slide, a grooved-disc capable of being swivelled in said block and set at any angle to the direction of reciprocation of the block, and means engaging the groove in said disc and operatively connected to the opposite ends of said roll support for imparting swivelling movements to the latter.

2. In roll grinding machines as claimed in claim 1, means for reciprocating the slide and the block in the guide ways in said slide, comprising a rack secured to said slide and a second rack guided in said slide and connected to said block, and two interconnected driving pinions having different numbers of teeth engaging said two racks.

3. In roll grinding machines as claimed in claim 1, the means for swivelling the roll support from the grooved disc, comprising a lever pivoted on the slide engaging said groove and also one end of said roll support, an arm upon said lever, a further lever also pivoted upon the slide engaging the other end of said roll support, and a rod connecting said arm and said further lever.

In testimony whereof I have signed my name to this specification.

HARRY HALES ASBRIDGE.