

1,431,024.

Patented Oct. 3, 1922.

4 SHEETS—SHEET 1.

Fig. 1

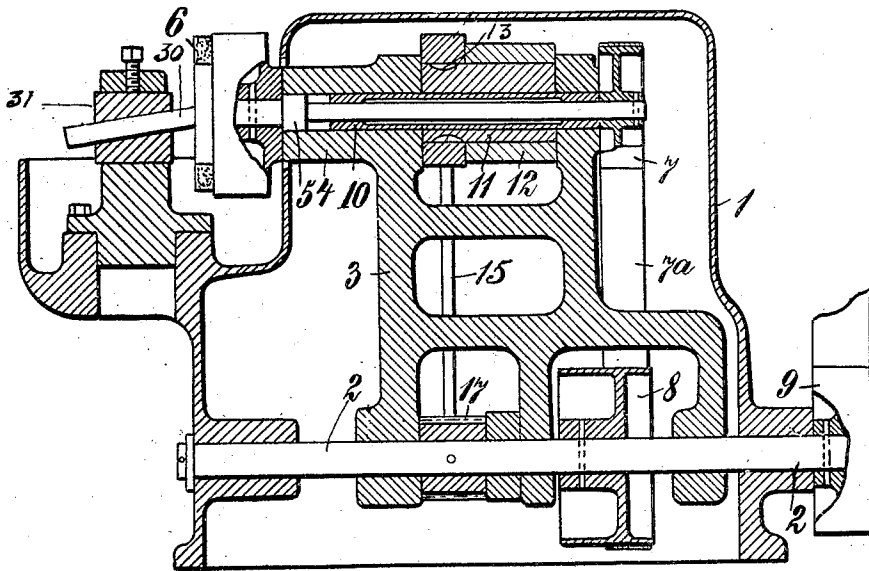
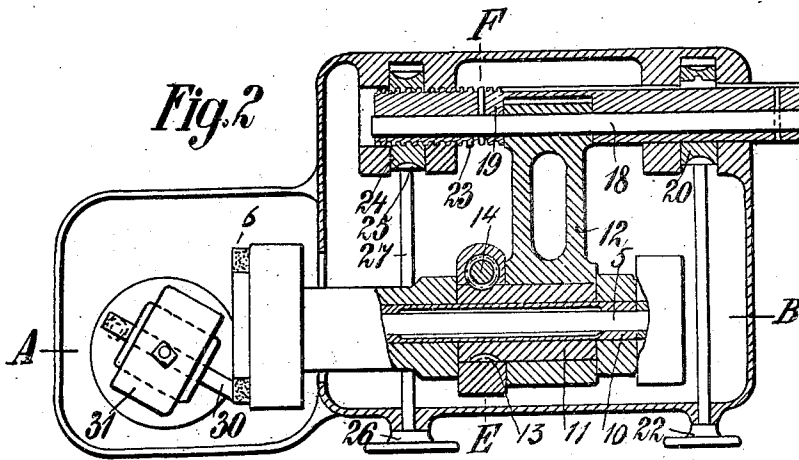


Fig. 2



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4 SHEETS—SHEET 2.

Fig. 3

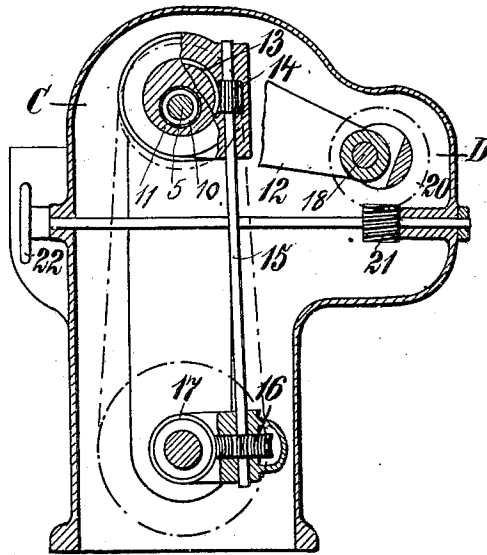
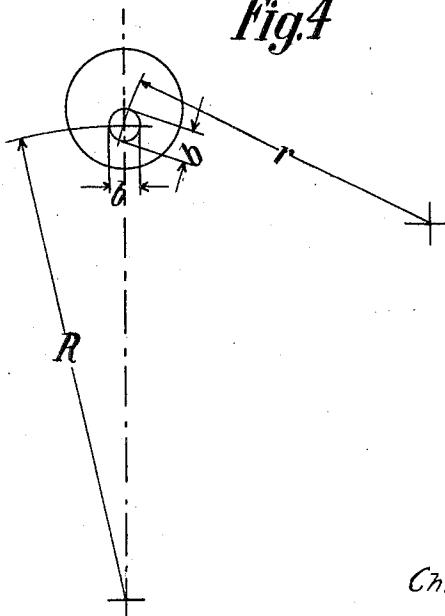


Fig. 4



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Fig.5

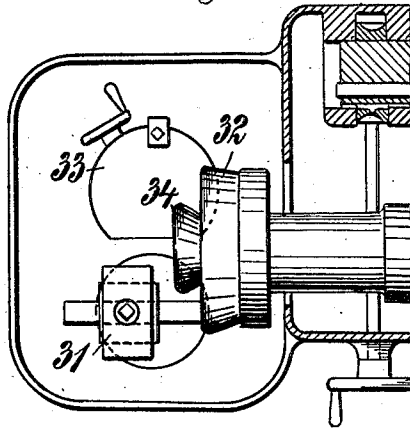


Fig.6

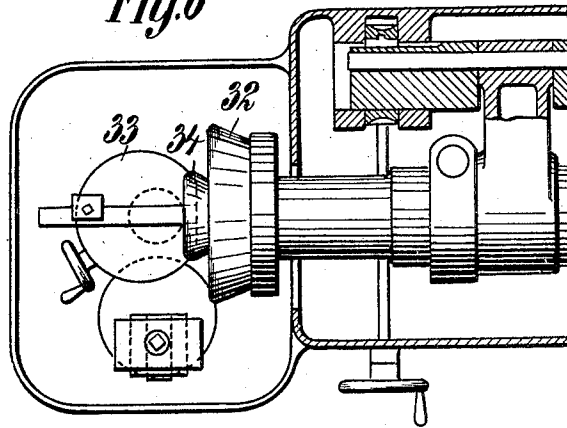
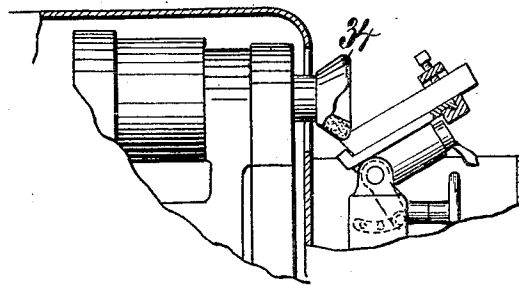


Fig.8



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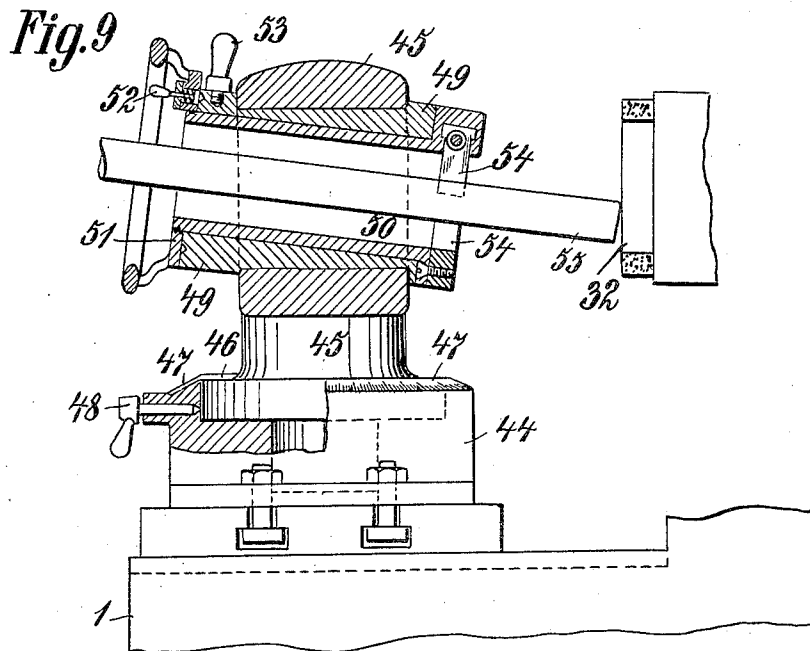
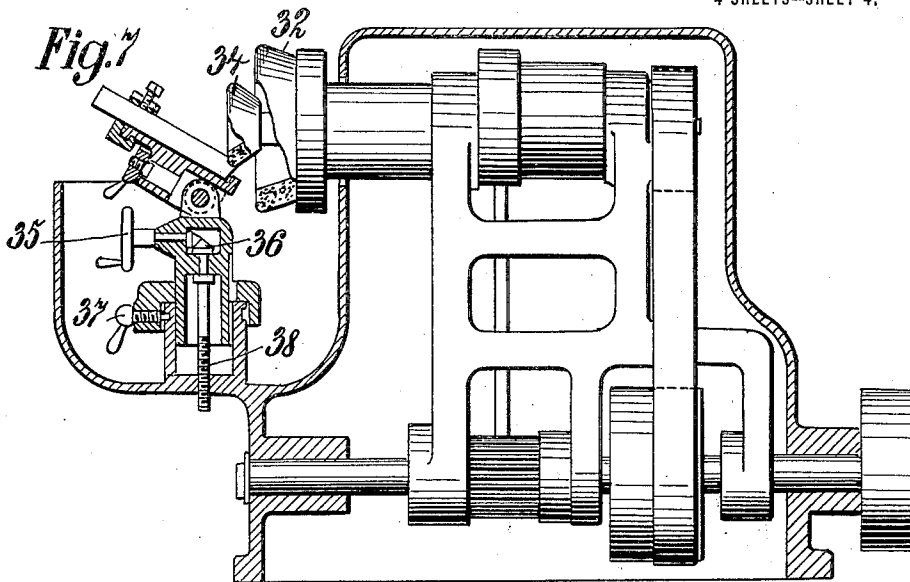
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GRINDING MACHINE.
APPLICATION FILED MAR. 21, 1922.

1,431,024.

Patented Oct. 3, 1922.

4 SHEETS—SHEET 4,



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UNITED STATES PATENT OFFICE.

CHRISTOFFER MUNTHE, OF DUSSELDORF-OBERKASSEL, GERMANY.

GRINDING MACHINE.

Application filed March 21, 1922. Serial No. 545,497.

To all whom it may concern:

Be it known that I, CHRISTOFFER MUNTHE, a citizen of the Republic of Germany, and a resident of Dusseldorf-Oberkassel, Germany, have invented certain new and useful Improvements in Grinding Machines (filed in Germany January 29, 1921); and I do hereby declare the following to be a full, clear, and exact description of the invention.

The present invention relates to a grinding device for drills, cutting steels and other cutting tools, in which the work-piece remains stationary while the grinding-disc is executing an oscillatory movement. The characteristic feature of the invention is to be seen in that the grinding disc is bearing in two swinging or rocking members in such a manner, that one of the swinging members is carrying the grinding spindle and its actuating device, while the other swinging member imparts to the grinding spindle an oscillating movement.

In the drawings several modes of execution of the invention are illustrated, in which—

Fig. 1 represents a vertical section through the machine along line A—B in Fig. 2;

Fig. 2 is an approximately horizontal section along line C—D of Fig. 3;

Fig. 3 is a vertical section along line E—F of Fig. 2;

Fig. 4 is a diagram;

Fig. 5 is a perspective view of another mode of execution, in which the table for hollow grinding is swung out of working position;

Fig. 6 is a perspective view with the holder for hollow grinding in working position;

Fig. 7 is a longitudinal section through the device for hollow grinding;

Fig. 8 shows the tilting of the table for hollow grinding opposite the profile disc; and

Fig. 9 shows on an enlarged scale the dividing head.

The frame 1 carries on a driving shaft 2 a rocking member 3 which is rotatable and capable of being shifted in a longitudinal direction, and which again carries in bearings 4 the grinding spindle 5 and the segment grinding disc 6 and pulley 7. The latter is driven directly by the lower pulley 8 while the pulley 9 is actuating the whole machine. The fixed pulley 8 is of such

width so as to allow the belt 7^a to travel along (Fig. 1) if the rocking member 3 is shifted in longitudinal direction.

A sleeve 10 attached to the rocking member 3 surrounds the grinding spindle 5 and runs in an eccentric boring of the sleeve 11, which is journaled in a horizontal rocking member 12 and driven by means of the worm-wheel 13, worm 14, shaft 15, worm-wheel 16 and worm 17 (Fig. 3). Through the turning motion of the sleeve 11 the rocking member 3 together with the grinding disc is oscillated in a horizontal direction, while the rocking member 12 is swinging either in an upward or downward direction. The eccentric capacity if desired, may be adjusted by the provision of a further inner eccentric-sleeve within the sleeve 11.

The rear oscillating axle 18 besides, is bearing eccentrically in a shaft, so that by turning said shaft by means of the worm-wheel 20, worm 21 and hand-wheel 22 it can be moved towards the front or rear, whereby the position of the grinding disc 6 is adjusted in respect of the work-piece.

The shaft 19 at its one end is provided with a thread 23 on which is laterally disposed a nut 24 having on its outer circumference milled worm teeth 25. By turning the hand-wheel 26, shaft 27, worm 28 and worm-wheel nut 25, the shaft 19 is shifted and will take along the rocking member 3 and thus cause the advance of the grinding disc 6.

The work-piece 30 is fixed in an adjustable holder 31 of known construction and will remain there stationary after adjustment.

The bearing of the grinding-spindle in two rocking members shows the following advantages:

The direct reception of the working-pressure by the upper rocking member; an almost straight oscillating movement of the grinding disc and thereby a gradual change of stroke by means of eccentrics, and direct belt drive of the grinding-spindle, while tension rollers of any sort or similar devices are dispensed with.

Further, the provision of heavy flying masses is avoided, whose momentum force would injuriously act upon the mechanism at the end of each stroke, in that the upper rocking member does not take part in the stroke, but only executes at the front bearing a slight up and downward movement,

while the rear swinging axle remains stationary, and in that the drive of the lower rocking member 3 is directly arranged on the grinding spindle 5.

5 Figs. 6, 7 and 8 show the grinding machine adapted for carrying out the hollow grinding or making the groove in steel working-tools.

The tool, in the present case a working
10 steel, is first fixed in the radius head 31 and the flat cutting faces are ground by the front face of the grinding body 32 in the manner described above. Then the piece is secured in the holder 33 and the groove
15 cut by means of the profile disc 34. In the case of large tools the groove may be obtained by means of the outside profile of the grinding body 32. For that purpose the profile disc is moved over the said holder
20 33 by manipulating the hand-wheel 22 (Fig. 3) and it will swing around this center-position during the grinding operation. As the oscillating movement is only slight and the rocking arm large in proportion, the
25 height of arc will be exceedingly small, so that the grinding may be described as practically straight. The adjustment is effected by raising the holder 33 by means of a hand-wheel 35, bevel wheels 36 and spindle 38.

30 The profile disc 34 is either arranged inside the grinding body 32 (Fig. 7) or at the opposite end of the grinding spindle (Fig. 8) or in any other suitable manner adjacent to the grinding body 32.

35 The holder 33 is arranged correspondingly at the left or right side of the frame and it may be swung out, when out of use, and locked in position by means of a handle 37 in order to obtain more space avail-
40 able for the other grinding work.

Fig. 9 represents the dividing head for the grinding machine, in which 1 is the frame and 32 the grinding-disc. The radius head 45 is provided at its base with a
45 scale 46, which latter is adjustable below an indicating device 47 on the bed-plate 44. The screw 48 serves for locking in the desired position. The gripping sleeve 50 for the work-pieces 55 is bearing in an eccen-
50 trical boring of a second sleeve 49 in such a manner, that by turning the latter, the

swinging of the work-piece 55 in an upward or downward direction is rendered possible. The gripping sleeve 50 is provided at its outside with a hand-wheel 51 55 for turning and the eccentric sleeve 49 is provided with a handle 53 for the purpose of adjustment. 52 is an indicating pin. For centering the work-piece 55 centering jaws 54 are provided, keeping it in proper 60 position.

I claim:

1. In a grinding machine, a rocking member and a grinding spindle carried thereby, an eccentric loosely mounted on the spindle, 65 driving means for the spindle and the eccentric, and means to oscillate the member comprising an arm one end of which surrounds the eccentric and the other has a relatively fixed pivoting axis. 70

2. A grinding machine according to claim 1, in which the pivoting axis of the said arm is eccentrically adjustable for varying the extent of oscillation of the rocking member.

3. In a grinding machine, a driving shaft, 75 a member mounted to swing upon the shaft, a grinding spindle carried by the member at a distance from but operated by the shaft, an eccentric at the outer end of the swinging member, an arm having one end in which the eccentric is carried, an adjustable pivot 80 for the other end of the arm, and a driving connection between the shaft and the eccentric for oscillating the spindle end of the swinging member. 85

4. In a grinding machine, a driving shaft and a member mounted to swing thereon, a grinding spindle carried by the member at a distance from the shaft, an arm having one end around the spindle and pivoted 90 about the other end, an eccentric connection between the member and the arm to swing the spindle relatively thereto, means for varying the pivotal connection of the arm to change the throw of the spindle, and 95 means to shift the arm lengthwise of its axis carrying the swinging member therewith for advancing and withdrawing the spindle.

In testimony that I claim the foregoing 100 as my invention, I have signed my name.

CHRISTOFFER MUNTHE.