Sept. 25, 1928. 1,685,757

W. STORCK

CIRCULAR GRINDING MACHINE

Filed March 5, 1926

Fig. 1.

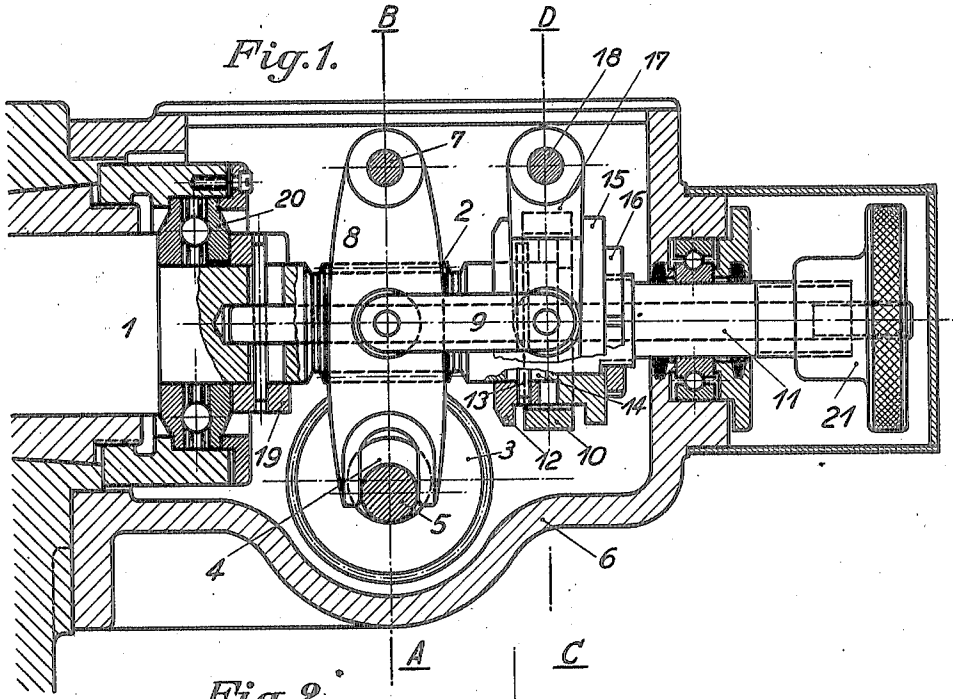
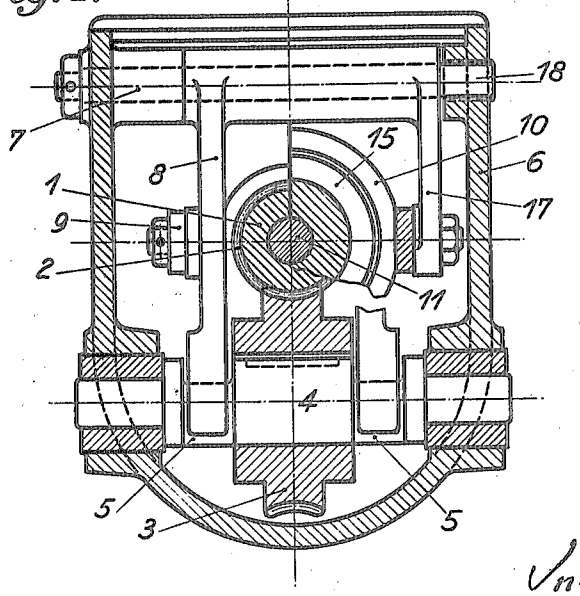


Fig. 2.



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CIRCULAR GRINDING MACHINE.

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My invention relates to circular grinding or polishing machines and has for its object the provision of means for imparting an axial to-and-fro movement of small amplitude to the grinding disc or wheel.

In circular grinding machines in which the grinding wheel is not moved past the work during the grinding operation, but in which the whole of the surface to be ground is operated upon within the range of the breadth of the grinding wheel it is very advantageous to give a short to-and-fro motion to the grinding wheel.

My invention consists in a simple and reliable device for obtaining the said to-and-fro motion which I accomplish by moving the grinding wheel spindle to-and-fro axially by means of at least one oscillating lever, the oscillation of which is produced by the grinding wheel spindle itself.

My invention is illustrated by way of example on the accompanying drawing in which Figure 1 is a sectional elevation and Figure 2 a transverse section, the left-hand half of this figure showing a section along line A—B in Figure 1 and the right-hand upper part showing a section along line C—D in Figure 1.

The extended grinding wheel spindle 1 carries a worm 2, which drives a worm wheel 3. The latter is mounted on a shaft 4 which is provided with eccentric pins 5 and is journalled in a frame 6. The eccentric pins 5 on the shaft 4 are engaged by single-armed oscillating levers 8 mounted on a shaft 7 which is likewise journalled in the frame 6. These oscillating levers 8 are connected by means of links 9 to a ring 10.

In a bore of the spindle 1, a slidable bolt 11 rests with which a ring 12 is connected by means of a pin 13. Slots 14 are provided in the spindle 1 to allow of the free passage of the pin 13. A second ring 15 is fixed on the spindle 1 by means of a nut 16. The ring 10 is arranged between the rings 12 and 15 which latter act as stops. In order to prevent the ring 10 from turning with the rings 12 and 13, it may be held by guide arms 17 which are mounted on a shaft 18 also journalled in the frame 6.

It is advantageous to mount a ring 19 on the bolt 11 in similar manner to the ring 12, which ring 19, when the bolt 11 moves in one direction, can be pressed against a part (such as the bearing 20) firmly fixed to the framework of the machine and thus acts to prevent undesired axial movement of the spindle 1. The mechanical connection of the two stops 12 and 19 prevents the possibility of errors in operating the machine. The bolt 11 and the spindle 1 are connected with one another by means of a differential nut 21, so that by a turn of this nut 21, the bolt 11 and the rings 12 and 19 connected with it are moved in an axial direction relative to the spindle 1.

In the position shown in the drawing, the to-and-fro motion of the spindle 1 is eliminated, as is necessary for instance for grinding shouldered work. In this case the ring 12 has been caused by movement of the bolt 11 to the left to move so far away from the stop ring 15, that the ring 10 can move freely between the stops 12 and 15 without carrying the spindle 1 with it. Moreover through the turning of the differential nut 21, the ring 19 has been firmly pressed against the fixed ball bearing 20 so that the spindle 1 is prevented from moving axially in one direction by the ring 19 and in the other by a shoulder on said spindle engaging the other side of said bearing 20.

In order that to-and-fro motion of the grinding wheel comes into action, the differential nut 21 is turned in the opposite direction whereby the ring 12 is brought so much nearer to the ring 15, that the ring 10 engages one of the stop rings, 12 or 15, in each direction and consequently is compelled to carry the spindle 1 with it in the movement imparted to it by the oscillating lever 8. By the movement of the bolt 11 to the right, the ring 19 is also separated from the bearing 20 permitting the spindle 1 to move.

I claim:

1. In a circular grinding machine or the like, a machine frame, a reciprocable grinding wheel spindle mounted therein, a lever pivotally mounted in said machine frame, means operatively connected to said spindle and engaging said lever for imparting oscillating movement thereto, and means transfering oscillating movement of said lever to said spindle, said means comprising adjustable mechanism on said shaft for regulating the extent of the movement imparted to said spindle.

2. In a circular grinding machine or the like, a machine frame, a reciprocable grinding wheel spindle mounted therein, a lever pivotally mounted in said machine frame, means

operatively connected to said spindle and engaging said lever for imparting oscillating movement thereto, and means transferring oscillating movement of said lever to said spindle, said means comprising adjustable mechanism on said shaft for regulating the extent of the movement imparted to said spindle, and additional means for locking the spindle against endwise displacement.

3. In the structure included in claim 2, said movement transferring means comprising a coupling ring.

4. In a circular grinding machine or the like, a machine frame, a reciprocable grinding wheel spindle mounted therein, means for reciprocating said spindle comprising a lever pivotally mounted in said machine frame, a crank shaft operatively connected to said spindle and engaging said lever for imparting oscillatory movement thereto, a stop on said spindle, a pin mounted for movement axially of said spindle, a stop on said pin, and a coupling ring operatively connected to said lever and positioned between said stops.

5. In combination with the structure included in claim 4, means for rendering said reciprocating means inoperative comprising a stop carried by said pin and engageable with said machine frame.

In testimony whereof I have affixed my signature.

WALTER STORCK.