Oct. 9, 1934. C. L. OTT 1,976,366

WHEEL BASE AND WORK DRIVE CONTROL

Filed June 5, 1931 2 Sheets-Sheet 1

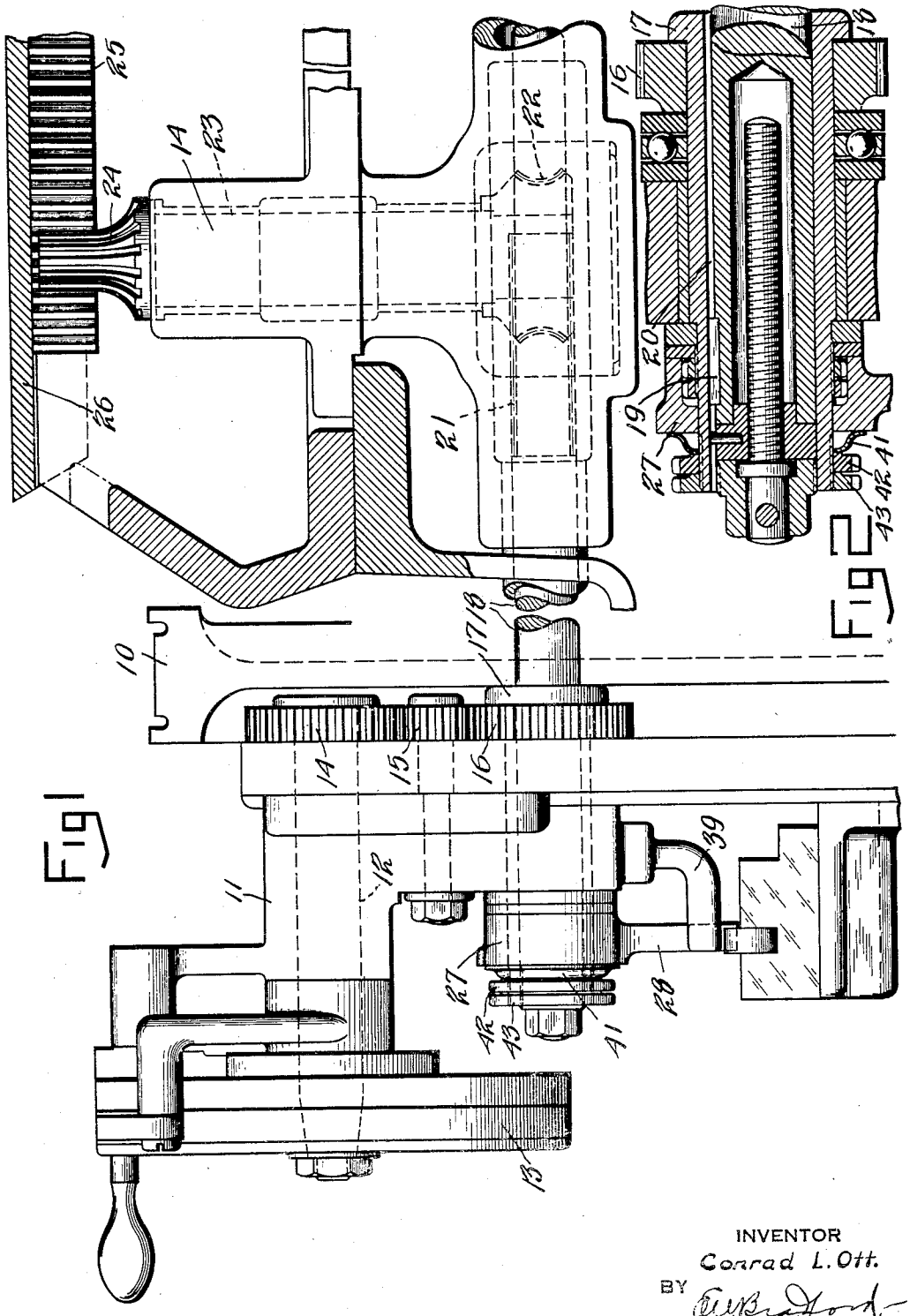


Fig 2

Fig 1

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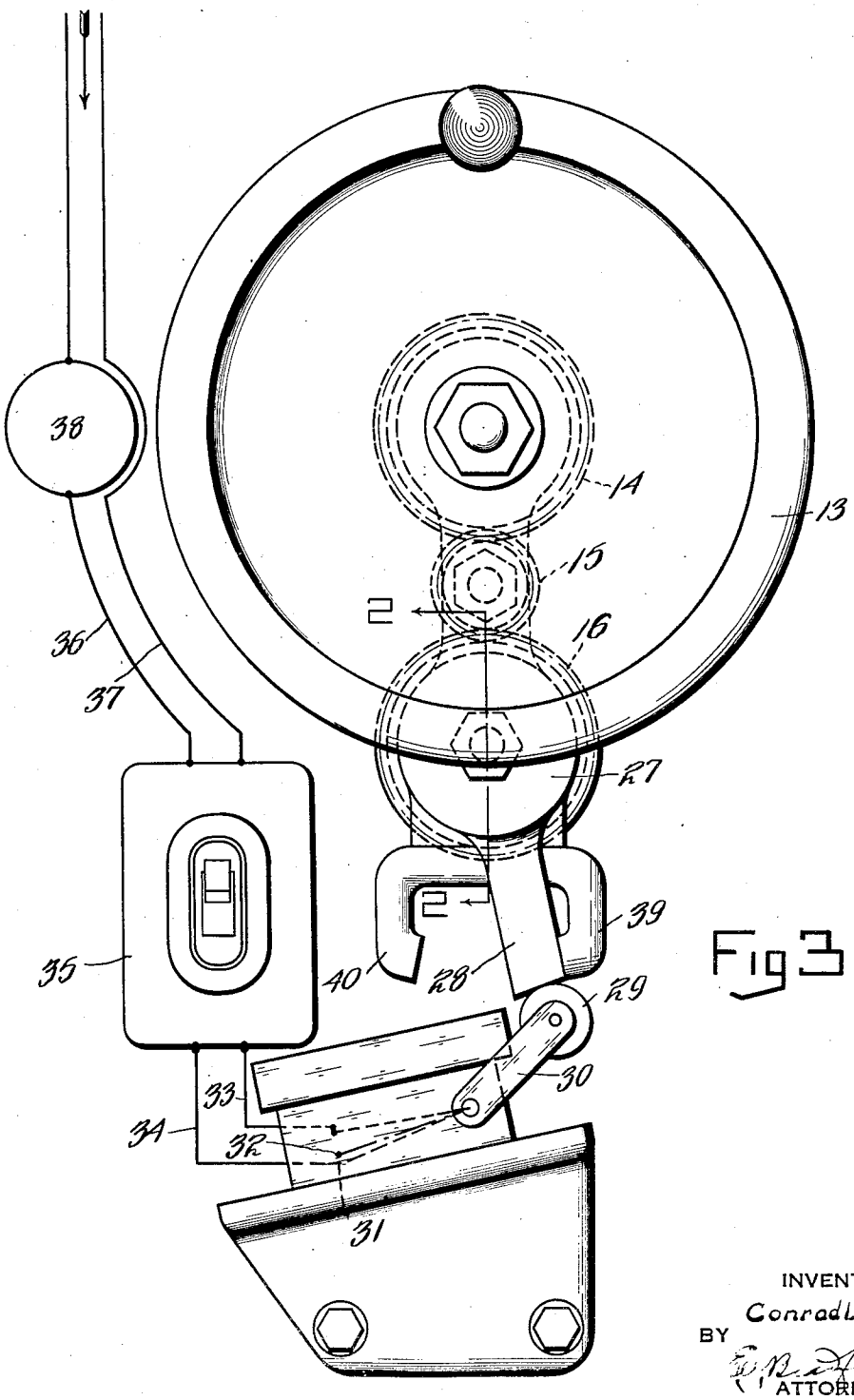


Fig 3

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WHEEL BASE AND WORK DRIVE CONTROL

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Application June 5, 1931, Serial No. 542,411

9 Claims. (Cl. 51—2)

This invention relates to operating mechanism for a grinding wheel feed and to control mechanism for the motor which operates the work drive motor. The object of the invention is to provide a single control for the grinding wheel feed and the work drive motor so as to start the work drive motor as the grinding wheel moves toward the work.

A further object is to provide means operating in conjunction with the hand wheel which feeds the grinding wheel toward the work to set the work drive motor in operation as the grinding wheel starts toward grinding position.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is an end elevation partly in section of a part of a grinding machine showing the hand wheel for feeding the wheel base toward the work and its mounting on the bed of the machine,

Figure 2, a section on line 2—2 of Figure 3, and

Figure 3, a front elevation showing a limit switch for starting the work drive motor.

In the drawings numeral 10 indicates a portion of the bed of the grinding machine having a bracket 11 of suitable construction in which is mounted a shaft 12 carrying an operating hand wheel 13. The inner end of the shaft 12 carries a gear 14 which meshes with an intermediate gear 15, the intermediate gear in turn meshing with a gear 16 on a sleeve 17. The sleeve 17 is mounted on a shaft 18 and is keyed to the shaft by a key 19 which slides in a slot 20 on the inner surface of the sleeve. The shaft 18 has a worm 21 cut thereon which meshes with a worm wheel 22 on the lower end of shaft 23. The upper end of the shaft has a gear 24 cut thereon or secured thereto, which gear meshes with a rack 25 on the wheel base 26. By means of the hand wheel 13 the wheel base is moved toward and from the work. The wheel base of course carries a grinding wheel not shown. Mounted on the front end of the sleeve 17 is a collar 27. This collar has a projecting arm 28, the lower end of which engages a roller 29 on the free end of an arm 30. The arm 30 controls a limit switch having contacts 31 and 32 which close circuit through lines 33 and 34 to a contact box 35. Closing of the circuit in the contact box 35 closes circuit through lines 36 and 37 with a motor 38 which drives the headstock. Stop brackets 39 and 40 are positioned at opposite sides of the arm 27 to limit movement of the arm. The outer face of the collar 27 is engaged by a friction disk 41 which is held against the collar by nuts 42 and 43. The nuts are set to hold the friction disk with sufficient tension against the colar 27 to cause the collar to rotate upon rotation of the sleeve 18 but to permit further rotation of the sleeve 18 after the arm 28 engages one of the stops 39 or 40.

The operation of the mechanism is as follows: After work has been positioned in grinding position the operator rotates the hand wheel 13 and through the connection described moves the grinding wheel base toward the work. As soon as he begins rotating the shaft 12 this in turn rotates the sleeve 17. Assume the hand wheel is moved in a clockwise direction, a slight movement of the hand wheel 13 will rotate the sleeve 17 so as to bring the arm 28 in contact with the roller 29 to release the limit switch, close contacts 31 and 32 and start operation of the work drive motor 38. The arm 28 will of course soon come into engagement with the stop 40 so that further rotation of the collar 27 is prevented. The friction disk 41, however, may slide on the face of the collar 27 so that the hand wheel may be rotated further to bring the grinding wheel to working position. It will be seen that the work drive motor is started at the time that the wheel base starts toward grinding position. When the work has been finished the operator rotates the hand wheel 13 in the opposite direction to withdraw the grinding wheel base from working position. As soon as the hand wheel 13 begins to move counterclockwise, the sleeve 17 is moved correspondingly in the same direction and brings the arm 28 into engagement with the roller 29. Contacts 31 and 32 are separated so that the work drive motor is stopped. The arm 28 moves until it engages stop 39 and then is prevented from further movement in this direction. Since friction disk 41 may slide on the face of the collar 27 the hand wheel 13 may be rotated until the wheel base is withdrawn sufficiently far to the rear to remove the work and position a new piece to be ground in work grinding position. It will be seen from the foregoing description that the work drive motor is operated in connection with movement of the wheel base toward and from working position. This simplifies control mechanism for the machine and enables an operator to give his attention to operations which require it.

It will be obvious to those skilled in the art that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the

specification, but only as indicated by the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a grinding machine having a wheel base and a motor for rotating the work, means for manually moving the wheel base toward the work, a switch for closing a circuit to the said motor, and means for operating the said switch by the said manual means at the beginning of movement of said manual means in either direction, substantially as set forth.

2. In a grinding machine having a wheel base and a motor for rotating the work, means for moving the wheel base toward the work and for simultaneously starting operation of the said motor comprising a manually operable shaft, a pinion in engagement with a rack mounted on the said wheel base, a second shaft operated by the said first named shaft and operatively connected to said pinion for rotating it to move the wheel base, a collar on said last named shaft and held so as to frictionally engage said shaft, a switch in control of a circuit to the said motor, an arm on said collar, said arm operating said switch upon movement of the collar, and a stop to limit movement of the said arm, said friction means being yieldable to permit said shaft to rotate independent of said collar when the arm engages the stop, substantially as set forth.

3. In a grinding machine having a wheel base and a motor for rotating the work, means for moving the wheel base toward the work and for simultaneously starting the said motor comprising wheel base operating gear and rack means, a shaft for operating said means, a switch in control of said motor, means frictionally engaging said shaft to be operated thereby, said means closing said switch upon rotation of the shaft in one direction and opening it upon rotation in the opposite direction, substantially as set forth.

4. In a grinding machine, a grinding wheel base, a train of gear connections for moving said wheel base, a manually operable shaft for operating said gears, a switch in control of means for rotating the work, means connected to the wheel base operating means for closing said switch when the wheel base is moved in one direction and for opening said switch when the wheel base is moved in the other direction, said switch closing means being frictionally connected to said wheel base operating means whereby the wheel base operating means may continue to move after said switch operating means has moved to its limit, substantially as set forth.

5. In a grinding machine having a work carriage and a wheel base movable toward and from the work carriage, manually operable means for effecting movement of said wheel base, a motor for driving the work, and means operable by said manually operable means for starting operation of the work drive motor upon a beginning of the movement of the wheel base toward the work and a stopping of the said motor upon beginning of the reversal movement of the wheel base from the work, substantially as set forth.

6. In a grinding machine having a wheel base, a work carriage and a motor for rotating the work, a switch in control of the circuit to said motor, manually operable means for moving the wheel base toward the work, and a yieldable connection between said manually operable means and the said switch, said switch being moved to open circuit to the said motor at the beginning of withdrawal of the wheel base from the work and to close circuit to said motor at the beginning of movement of the wheel base toward the work, said yieldable connection permitting continuous movement of the manually operable means after the said switch has been opened or closed to permit the wheel base to be moved to the limit of its travel in either direction, substantially as set forth.

7. In a grinding machine having a work carriage, a motor for rotating the work, a wheel base movable toward and from said work carriage, manually operable means for effecting such movement, a switch in control of the operation of the work rotating motor, and a yieldably operable connection between said switch and said manually operable means for opening said switch upon a beginning of movement of the manual withdrawal of the wheel base and for a closing of the switch upon a beginning of the movement of the manual operation of the wheel base toward the work, substantially as set forth.

8. In a grinding machine having a work carriage and having a wheel carriage manually movable at right angles to movement of the work carriage, means for manually moving the wheel carriage, an electric motor for rotating the work, a switch in control of said motor, means operated upon the beginning of movement of the wheel support either toward or from the work for operating said switch.

9. In a grinding machine, a work support, an electric motor for driving the work, a switch in control of said motor, a wheel carriage, manually operable means for moving said wheel carriage toward the work and from the work, switch operating means operable by said manual means for operating said switch operating means to close said switch as the wheel carriage starts towards the work and for opening said switch as the wheel carriage starts its withdrawal movement, a stop for said switch operating means, and a friction drive between the said manual means and said switch operating means to permit said manual means to operate after said switch operating means has reached the limit of its movement in either direction.

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