T. F. BERNARD.

MECHANICAL COMPOUND GRINDING HEAD FOR GRINDING TWO CYLINDRICAL MACHINE PARTS AT THE SAME TIME.

APPLICATION FILED APR. 1, 1920.

1,367,523.

Patented Feb. 1, 1921.

4 SHEETS—SHEET 1.

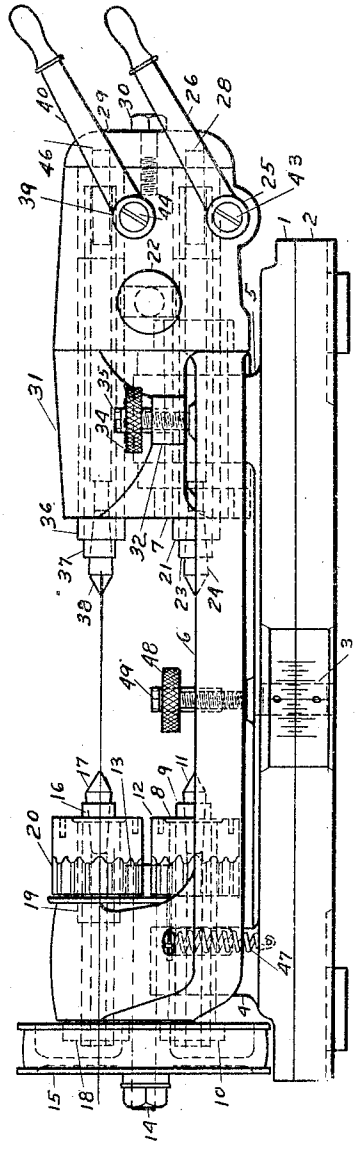


FIG. 1

WITNESSES

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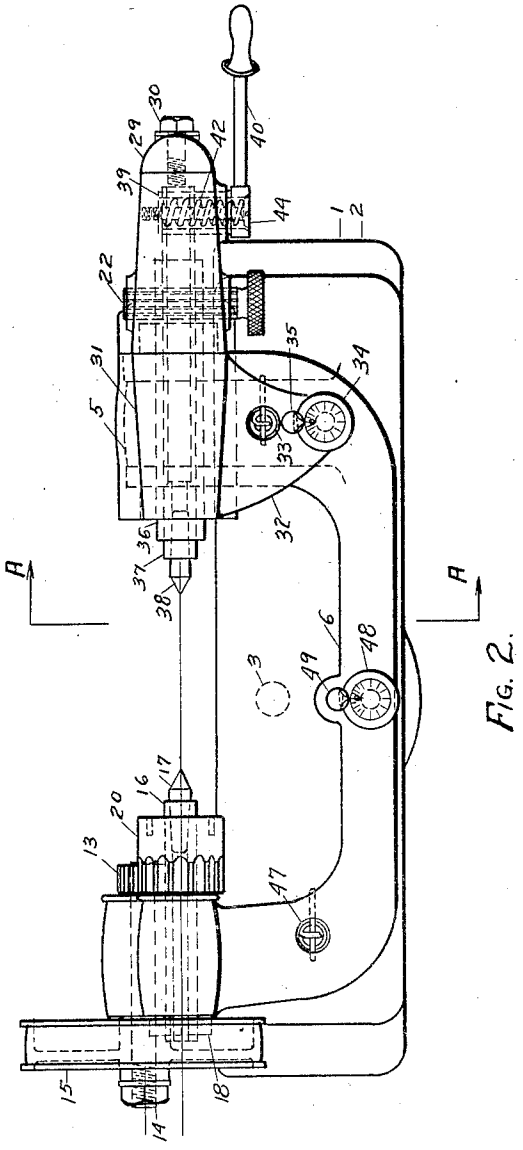


FIG. 2.

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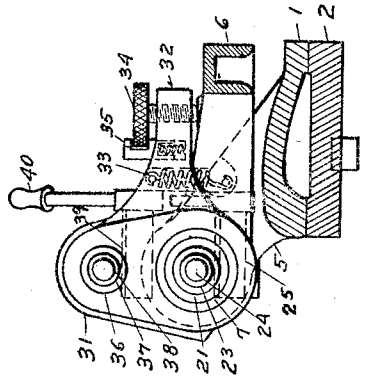


FIG. 4.

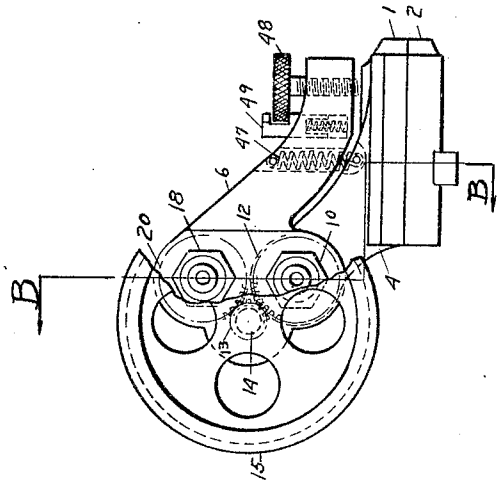


FIG. 3.

WITNESSES

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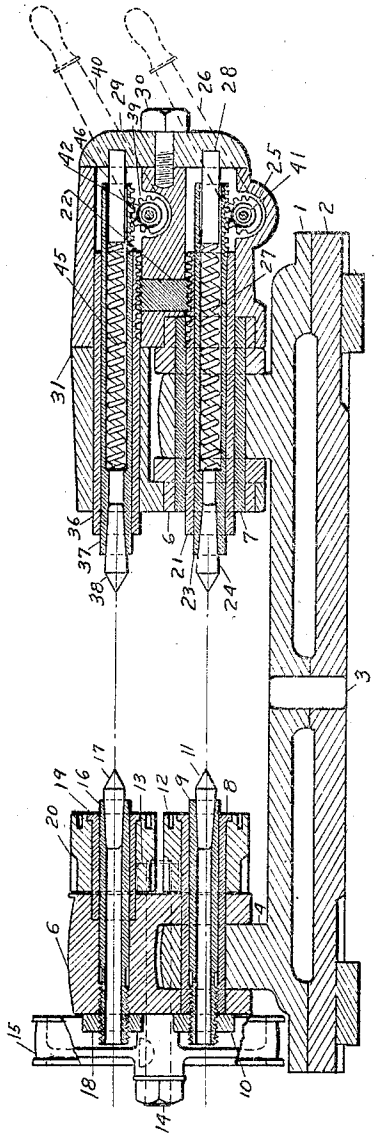


FIG. 5.

WITNESSES

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MECHANICAL COMPOUND GRINDING-HEAD FOR GRINDING TWO CYLINDRICAL MACHINE PARTS AT THE SAME TIME.

1,367,523. Specification of Letters Patent. Patented Feb. 1, 1921.

Application filed April 1, 1920. Serial No. 370,437.

To all whom it may concern:

Be it known that I, THEIS F. BERNARD, a citizen of the United States, and residing at the city of Detroit, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Mechanical Compound Grinding-Heads for Grinding Two Cylindrical Machine Parts at the Same Time, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of these specifications.

The objects of my invention are to provide a more rigid means for holding and grinding two cylindrical parts at the same time, on a single grinding wheel, and to have a solid and rigid adjusting frame for carrying the upper spindle; adjustment for varying this frame to bring the mechanical part in contact with the surface of the grinding wheel, and to have adjustable spindles for the varying lengths of the pieces to be ground.

It is a further object of my invention to secure simplicity in construction, accuracy of adjustment, and ease in operation. These several objects are secured in the preferred form by the construction and arrangement of the parts as are more fully hereafter described.

Similar parts, on all drawings are marked by the same numerals.

Figure 1, is a front view of the grinding head showing the general arrangement of the supporting frame for the double grinding spindles, with means for adjusting same to the grinding wheel.

Fig. 2, is the top view showing the vertical arrangement of the grinding spindles, with the driving and adjusting parts.

Fig. 3, is an end view showing the driving gears of the double spindles, and the adjusting frame.

Fig. 4, is a sectional view —AA— as is shown on Fig. 2, showing the secondary adjusting frame for the alinement of the upper spindle with the lower spindle.

Fig. 5, is a sectional view —BB— as is shown on Fig. 3, showing the complete arrangement of the double spindles, with the adjusting sleeves, racks, and means for operating same.

I will now describe more fully, the working parts and the construction thereof, referring to the accompanying drawings and the marks thereon.

The compound grinding head is to be used in connection with the horizontal table of a grinding machine and mounted thereon and securely fastened thereto by the swivel base plates 1 and 2, which are pivoted together at the center by pin 3, base plate 1 carrying at each end solid and permanent bearings 4 and 5. Mounted thereon is a solid adjusting frame 6 which is pivoted to both bearings 4 and 5 by means of the hollow sleeve collars 7 and 8 passing through the bearings and allowing the adjusting frame 6 to rock on the pivot bearing sleeves. The adjustable bearing 6 is held securely in place by means of a coil spring 47 which passes through the frame and fastens to the base plate 1. Also the drive pulley 15 is placed outside the axis of the grinding spindles and causes an upward pressure by the belt, thus rocking the frame 6 more firmly against the supporting base plates. In the center of the arm of the adjustable frame 6 is a micrometer adjusting screw 48, any turning of which will rock the frame 6 about the lower grinding spindle, giving adjustment to the secondary spindle above so as to bring the work against the surface of the grinding wheel. The micrometer screw 48 is kept from turning by a pressure plug 49 and a coil spring underneath the plug. At the driven end and within the sleeve bearing 8, is an adjustable sleeve 9 and which is threaded thereto at one end and securely fastened by a locknut 10, which provides for the horizontal adjustment of the inner sleeve 9. Inside the sleeve 9 is a stationary center point 11. Outside of, and rotating thereon, is a driving gear 12. Gear 12 carries gear teeth cut on the inner end thereof which engages the teeth of the common drive gear 13, and on the outer face carries socket holes therein forming a combined gear and face plate, for means of driving the work mounted on the center point 11. Drive gear 13 is keyed to shaft 14 which is mounted in the adjustable frame 6, and is driven by the drive pulley 15 keyed thereto. The pulley 15 is driven

by means of a power belt. In the upper half of the adjustable bearing 6 on the driven end, is mounted therein the secondary sleeve spindle 16 and carries within the end a stationary center point 17. Sleeve 16 is threaded at one end to the adjustable bearing casting 6, and secured by lock nut 18, which provides a means for the horizontal adjustment of sleeve 16 and center point 17. Outside of sleeve 16 and sliding thereon, is an outer sleeve 19. Sleeve bearing 19 carries drive gear 20 which rotates thereon, and like gear 12 carries gear teeth cut on the inner edge and engages the teeth of the common drive gear 13, and the outer face carries socket holes therein forming a combined gear and face plate, with means for driving the work mounted on the secondary grinding spindle center point. At the tail center end mounted within the hollow sleeve bearing 7, is a hollow adjustable sleeve 21. Sleeve 21 carries gear teeth on the upper edge and engages the teeth on the lower edge of the sliding lock block 22. This allows a permanent adjustment of the tail spindle sleeve 21. By pulling slide 22 out thus disengaging the teeth, and adjusting the sleeve to the desired position to fit the length of the work to be held between the center points on the lower spindle, and pushing the lock block 22 in place thus locking the sleeve. Inside the sleeve 21 is a secondary sliding sleeve 23, which carries a tail center point 24. Sleeve 23 also has gear teeth cut in the edge and engage the teeth in the release gear 25. Fastened to gear 25 is a lever 26. Any movement downward of lever 26, will rock the release gear 25 and draw the inner sleeve 23 with its center point, back from the work, and thus releasing the work from between the center points. Inside of sleeve 23 is a coil spring 27 which presses against the sleeve casing causing a horizontal pressure and holding the center points against the work. Also within the sleeve 23 and sliding therein, is a support rod 28 for the coil spring 27. Rod 28 is driven into cap 29 and held firmly in place by bolt 30. Mounted on the adjustable bearing frame 6, and directly above at the tail center end, is a secondary adjustable bearing 31, which is pivoted thereto and rocks about the same center on sleeve bearing 7. On the side of the adjustable bearing 31 is an adjusting arm 32, which is firmly held against the frame 6 by a coil spring 33, passing through both arms and connected to the main bearing 5. Also in the adjusting arm 32, is a micrometer adjusting screw 34, any turn of which will rock the bearing about the collar 7 and give an adjustment to the upper tail center to bring it in true alinement with the lower grinding spindle, thus caring for any taper in the work, the micrometer screw being held in place by a friction plug 35 and a coil spring underneath. At the top of bearing 31 and mounted therein is an adjustable supporting sleeve 36. The bottom edge of sleeve 36 carries gear teeth which engage the teeth of the lock-block 22. By pulling the block 22 out, it releases the teeth in the sleeve 36 and allows a horizontal adjustment of the tail center for the upper spindle, to fit desired lengths of work to be held for grinding. By returning the block 22 to place the sleeve 36 is locked firmly in position. Within the sleeve 36 is a sliding sleeve 37, and carries within the end a center point 38. On the outer edge of sleeve 37 are gear teeth which engage the gear teeth of the release gear 39. Connected to gear 39 is a lever 40. A movement downward of lever 40 will rotate gear 39, and move sleeve 37 horizontally, thus releasing the center point 38 from the work. Within both the hollow gears 25 and 39 are coil springs 41 and 42, and held in place so as to press against the bottom of the gear socket by means of screws 43 and 44. For making an added adjustment of the sleeves 23 and 37 either gear can be pulled endwise against the springs, thus disengaging the teeth on the sleeves, and allowing the sleeve to slide freely. Inside of sleeve 37 is a coil spring 45, and presses against the sleeve shoulder, thus giving it a horizontal pressure and holding the center point 38 in the secondary spindle firmly against the work. Also within the sleeve 37 and sliding therein, is a plug 46 which supports the coil spring 45. Plug 46 is driven in the cap 29 and held in place by bolt 30.

I do not wish to confine myself to the exact construction as herein described, but merely give this as a preferred form of construction.

Having fully described my invention herein, what I claim as my invention and desire to secure by Letters Patents is:

1. In a compound grinding head for holding and grinding two cylindrical machine parts at the same time, in combination with the horizontal table of a grinding machine and the rotating grinding wheel thereon, a base fixedly attached to the horizontal table, a secondary base swiveled thereto and carrying a solid and stationary bearing at each end thereof, a lower primary spindle mounted therein, and means for rotating work thereon, a solid adjusting frame mounted on said bearing and rocking about the same center, means for adjusting said frame, a secondary spindle mounted on top of the adjustable frame, and means for rotating the work thereon.

2. In a device of the character described in combination with the horizontal table of the grinding machine and the rotating wheel thereon, a base fixedly attached to the horizontal table, a secondary base swiveled there-

to, a stationary bearing attached to each end of the upper base plate, a hollow sleeve bearing therein, a solid adjusting frame pivoted on said bearings, means for adjusting said frame, a sliding adjustable sleeve within the sleeve bearing, and means for a horizontal adjustment of same, a center point mounted in the end of the sliding sleeve, means for rotating the work thereon, a sliding adjustable sleeve mounted in the top of the adjustable frame for the secondary spindle, means for a horizontal adjustment of said sleeve to hold same securely in position, a center point inside of said adjustable sleeve, means for rotating work thereon.

3. In a device of the character described in combination with the horizontal table of a grinding machine and the rotating grinding wheel thereon, of a swiveled base securely attached to the horizontal table, a stationary bearing at each end of the base, a solid adjusting frame pivoted to the bearings, means for adjusting said frame, a sliding adjustable sleeve spindle with a stationary center point at the driven end, means for a horizontal adjustment of same, a combination gear and face plate mounted on the hollow sleeve bearing and rotating thereon, and concentric with the lower adjustable sleeve and center point, means for driving said gear, and means for driving the work about the center point from the socket face of the gear, a secondary stationary spindle mounted in the top of the adjustable frame, a combination gear and face plate rotating thereon and concentric therewith, means for driving said gear, and means for driving the work on the stationary center point from the socket face of the gear.

4. In a device of the character described in combination with the horizontal table of a grinding machine and the rotating grinding wheel thereon, of a compound swiveled base fixedly attached to the table, a stationary bearing attached to each end of the base, a hollow sleeve bearing therein, a solid adjusting frame pivoted on said bearings, means for adjusting said frame, a primary and a secondary spindle mounted therein at the driving end, a combination gear and face plate rotating on each of said spindles, a common drive gear engaging the teeth of the combination gears and causing the rotation thereof, a driven shaft with pulley attached for said gears and securely attached thereto, said shaft being mounted on the outside of the adjusting frame so that the upward pressure of the drive belt will tend to rock said frame about the center of the lower spindle and hold the same in a solid and rigid position against the base, and means for driving said pulley.

5. In a device of the character described in combination with the horizontal table of a grinding machine and the rotating grinding wheel thereon, of a compound swiveled base fixedly attached to the table, and carrying stationary bearings at each end, a solid adjusting frame pivoted thereon, means for adjusting said frame, a sliding adjustable support sleeve inside of the pivot bearing at the tail end, and to be extended from the bearing for the support of the tail center point, means for holding support sleeve in position, a secondary adjustable bearing mounted on top of the adjustable frame at the tail center end thereof, and pivoted about the center of the lower spindle, means for adjusting said secondary bearing, a sliding adjustable support sleeve mounted in the top of the secondary bearing, and means for adjusting said support sleeve.

6. In a device of the character described in combination, with the horizontal table of a grinding machine and the rotating grinding wheel thereon, of a compound swiveled base fixedly attached to the table, with a stationary bearing attached to each end thereof, a hollow sleeve bearing therein, a solid adjustable frame pivoted on said bearings, means for adjusting said frame, a secondary adjusting bearing mounted on the tail end of said adjusting frame, means for the adjustment of said bearing, a primary and a secondary tail spindle mounted therein, an adjustable supporting sleeve for each of said tail spindles, a lock block to engage the teeth of each of the support sleeves thus holding them securely in position.

7. In a device of the character described in combination with the horizontal table of a grinding machine and the rotating grinding wheel thereon, of a base fixedly attached to the table, a secondary base swiveled thereto with a stationary bearing attached to each end thereof, a hollow sleeve bearing therein, a solid adjusting frame pivoted on said bearings, and means for adjusting said frame, a secondary adjustable bearing mounted on the tail end of said adjustable frame with means for adjusting same, a supporting sleeve for both the upper and lower tail spindles, means for adjusting and locking same, a hollow sliding spindle carrying the tail center point within each of the supporting sleeves, means for holding the spindles in place against the work, a hollow release gear engaging the teeth on the edge of the spindle, means for rotating said gear, a coil spring within said hollow gear to allow it to be pulled out thus disengaging the teeth of the sleeve for adjustment and to return said gear to place in its new position, and means for holding spring inside of the gears.

8. In a device of the character described in combination with the horizontal table of a grinding machine and the rotating grinding wheel thereon, of a compound base fixedly attached to the table, a stationary bearing

fixedly attached to each end of the base, a hollow sleeve bearing therein, a hollow adjustable frame pivoted on said bearings, means for adjusting said frame, a secondary adjustable bearing mounted on the tail end of said adjustable frame with means for adjusting same, a supporting sleeve for both the upper and lower tail spindles, a coil spring and a stationary supporting plug within the spindles to hold the center points firmly against the work, a supporting cap for holding said plugs in position against the springs.

In testimony whereof I, THEIS F. BERNARD, sign these specifications.

THEIS F. BERNARD.

Witnesses:
FREDERICK M. EHEHALT,
MYRON J. DIKEMAN.