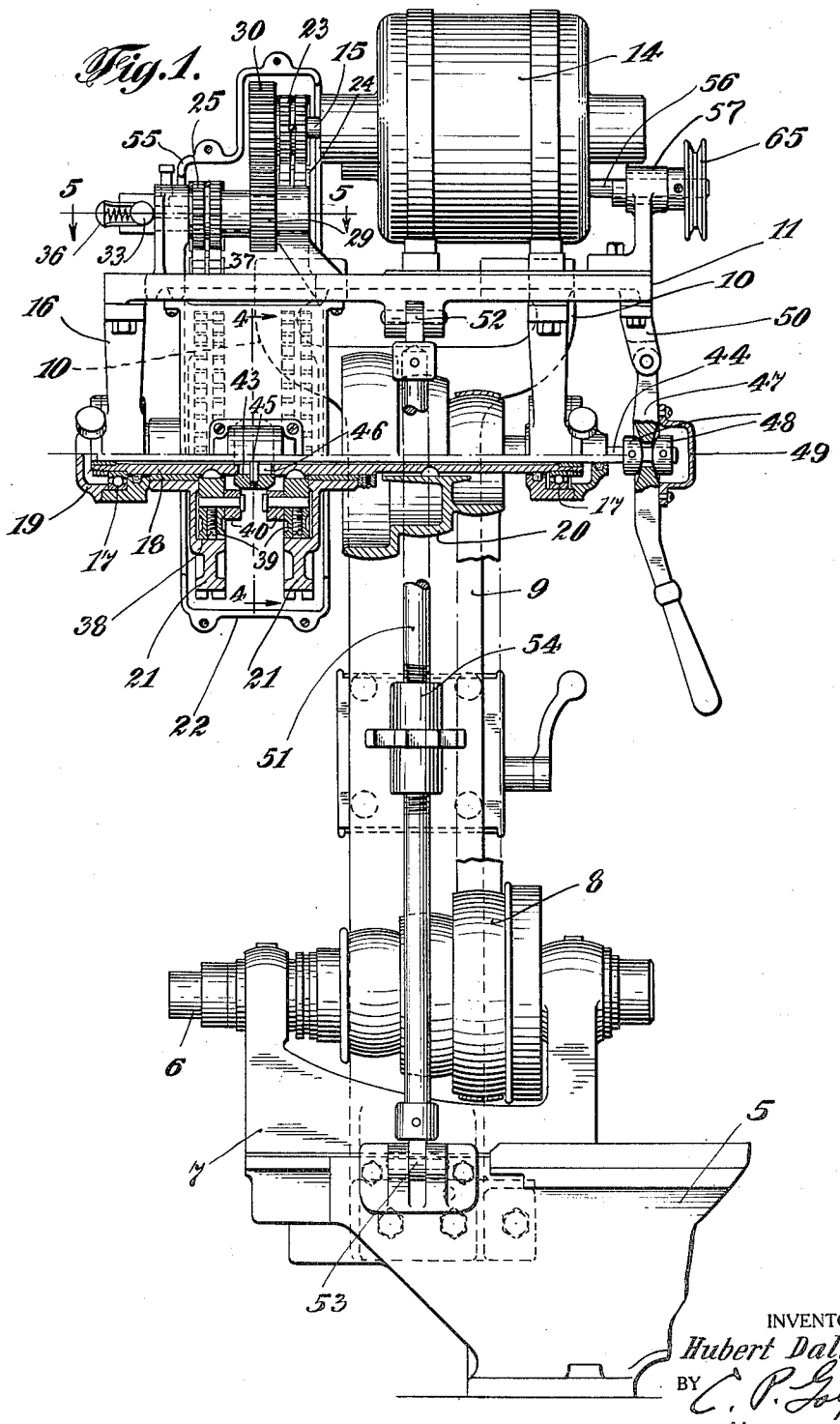
Feb. 18, 1930. H. DALTON 1,747,621

DRIVE MEANS FOR LATHES AND SIMILAR MACHINES

Filed June 13, 1924 3 Sheets-Sheet 1

Fig. 1.



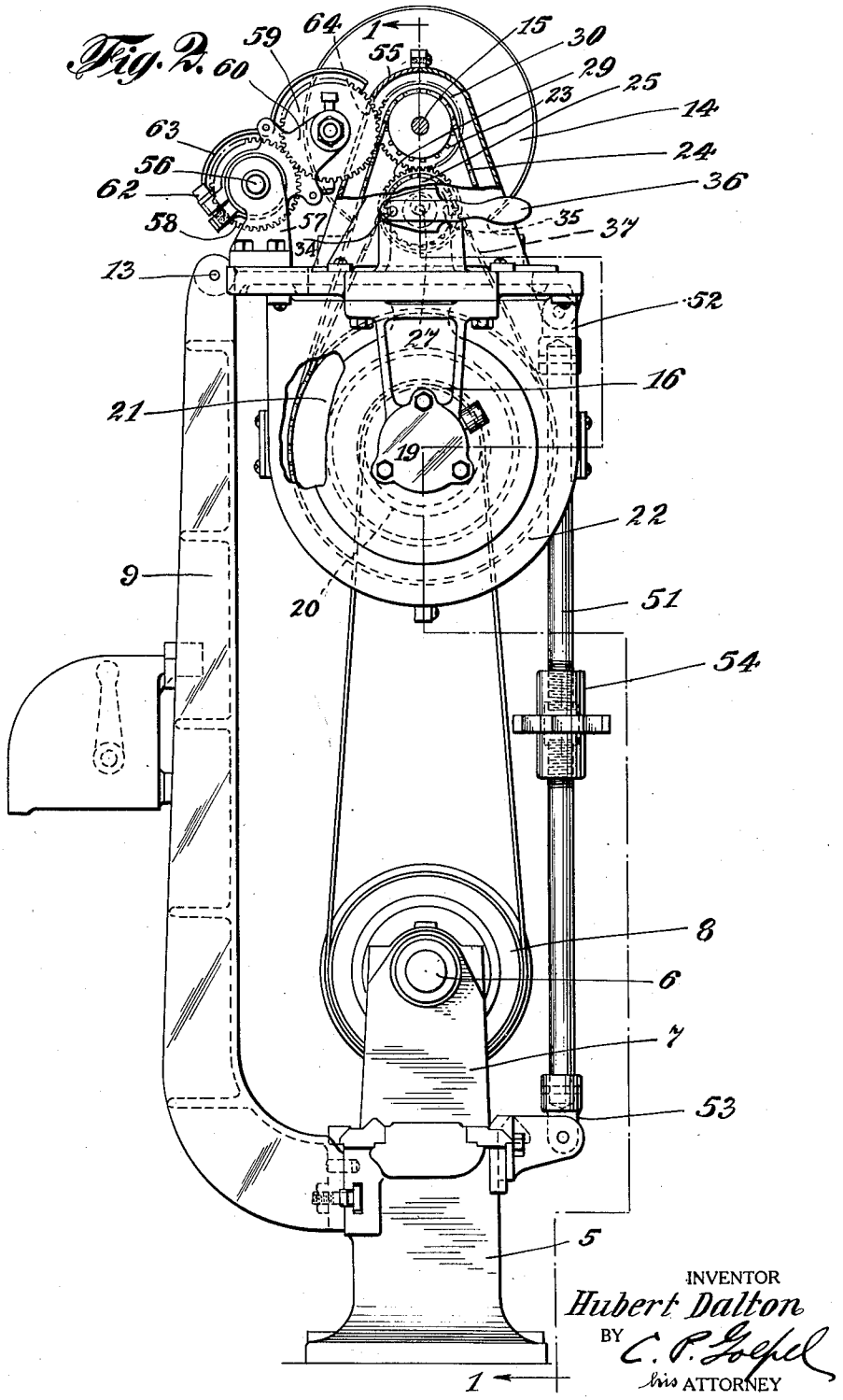
INVENTOR
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DRIVE MEANS FOR LATHES AND SIMILAR MACHINES

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Fig. 2.



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DRIVE MEANS FOR LATHES AND SIMILAR MACHINES

Filed June 13, 1924 3 Sheets-Sheet 3

Fig. 3.

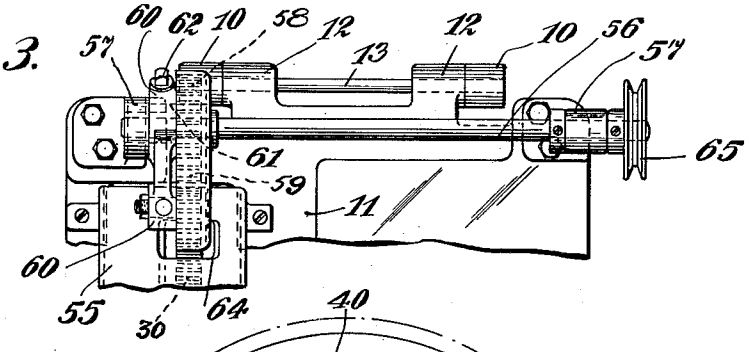


Fig. 4.

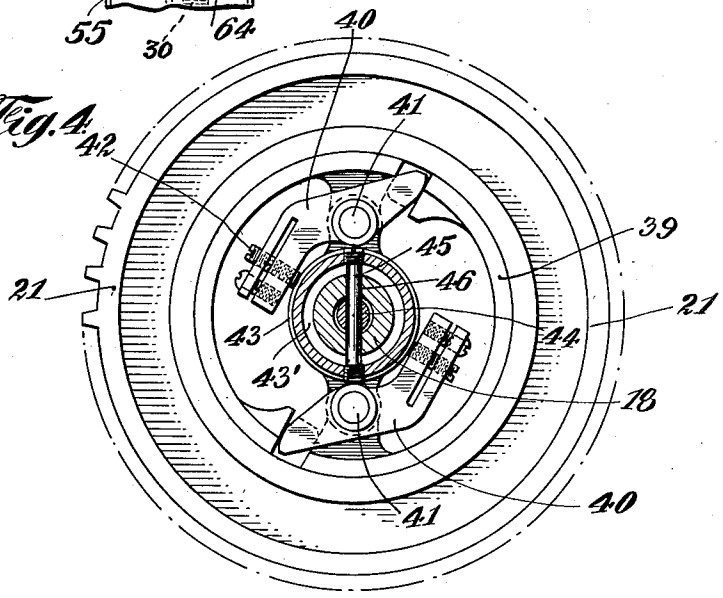


Fig. 5.

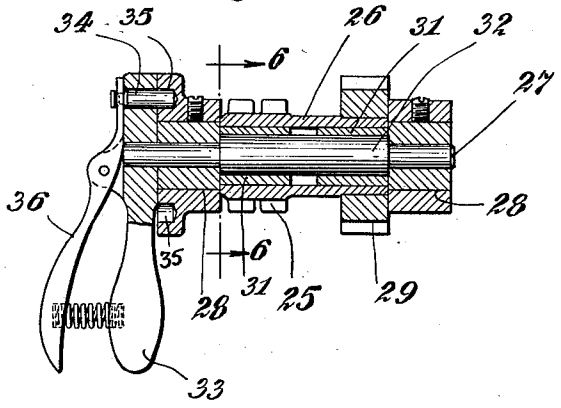
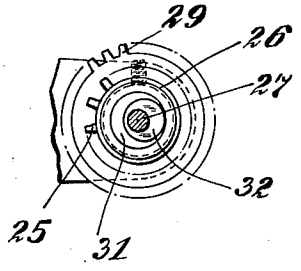


Fig. 6.



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UNITED STATES PATENT OFFICE

HUBERT DALTON, OF SOUND BEACH, CONNECTICUT

DRIVE MEANS FOR LATHES AND SIMILAR MACHINES

Application filed June 13, 1924. Serial No. 719,756.

The invention relates to drive means for lathes and similar machines and has for its primary object and purpose to provide an individual motor drive particularly designed for use in connection with engine turning lathes.

It is another object of my invention to provide a very simple, compact and well balanced arrangement and mounting of the electric drive motor and the counter-shaft driven thereby and from which the power is in turn transmitted to the head-stock spindle of the lathe. Another novel feature of my present improvements resides in the provision of simple, durable and positively operating means under the control of the mechanic, whereby rotation may be transmitted in either direction to the counter-shaft from the motor shaft.

Further, one of the detail items of improvement which I have made in machines of this kind, resides in the provision of an adjustably mounted motor supporting table from which the counter-shaft is suspended and means for easily and quickly effecting the necessary adjustment whereby the proper tension may be placed upon the driving belt connections between the counter-shaft and the lathe spindle.

In addition to the foregoing, I also provide a supplementary counter-shaft and means for establishing a driving connection between the same and the motor shaft whereby an auxiliary machine, such for instance as a grinder, may be operated at high speed.

With the above and other objects in view, the invention consists in the improved motor drive means for lathes and in the form, construction and relative arrangement of the several parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claims.

In the drawings wherein I have illustrated one simple, practical and satisfactory embodiment of the invention and in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a front elevation partly in section, illustrating one desirable embodiment of my present improvements, as indicated by line 1—1 of Fig. 2;

Figure 2 is an end elevation;

Figure 3 is a fragmentary plan view, showing the supplementary counter-shaft and driving connections therefor;

Figure 4 is an enlarged detail view illustrating one of the clutch devices for transmitting power from the motor shaft to the main counter-shaft;

Figure 5 is an enlarged detail section taken on the line 5—5 of Figure 1, illustrating the means for reversing the direction of drive from the motor shaft to the counter-shaft; and

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

For the purpose of illustrating one practical application of the present improvements, in the accompanying drawings I have shown my new individual motor drive means as applied to a conventional type of engine turning lathe which includes the usual bed 5 upon one end of which the head-stock spindle 6 is mounted in a suitable bearing 7. Upon this spindle the usual stepped pulley 8 is fixed whereby said spindle may be rotated at various speeds.

To the rear side of the bed 5, the lower end of an upright 9 is rigidly fixed, the upper end of said upright being forked to provide the spaced bearing arms 10.

A motor supporting table or plate 11 has spaced bearing lugs 12 on its rear edge which are loosely engaged at the inner sides of the arms 10 upon the hinge pin or rod 13 fixed at its ends in said arms. Upon the upper side of the table or plate 11 an electric motor 14 is suitably mounted, the motor shaft 15 extending longitudinally of said table or in parallel relation to the lathe spindle 6. From this motor shaft rotation is transmitted in either direction to a counter-shaft in the manner which I shall now describe.

To the underside of the table 11 at its opposite ends the hanger arms 16 are securely fixed, the lower end of each of said hanger arms being provided with ball bearings 17 in which the opposite ends of a hollow counter-shaft 18 are mounted. The bearings 17

are held in place by suitable caps 19 fixed to the outer sides of the hangers 16. Upon the countershaft 18 a stepped pulley 20 complementary to the pulley 8 on the head-stock spindle, is fixed and these pulleys are adapted to be connected with each other by the usual drive belt whereby power may be transmitted from the counter-shaft to the spindle at a desired speed.

Between the pulley 20 and one of the hanger bearings 16, two sprocket wheels 21 of relatively large diameter, are loosely mounted upon the counter-shaft 18 in spaced relation to each other and are enclosed within a two-part housing 22 fixed to the underside of the table 11. One of the sprocket wheels 21 is in vertical alignment with the sprocket pinion 23 fixed upon the motor shaft 15 and to which it is connected by the drive chain 24. The other sprocket wheel 21 is in alignment with a sprocket pinion 25 on one end of a sleeve 26 supported by a shaft 27 journaled in spaced bearings 28 on the upper surface of the table 11. To the other end of said sleeve a gear 29 is fixed and is adapted to mesh with a gear 30 secured on the motor shaft 15. Within the sleeve 26 bushings 31 are engaged and receive the intermediate eccentric section 32 of the shaft 27. To one end of this shaft a hand lever 33 is keyed or otherwise securely fixed and carries a latch pin 34 adapted for engagement in spaced sockets or recesses 35 provided in the bearing 28 whereby the shaft 27 is held in its adjusted position. This latch pin may be conveniently actuated by means of a spring pressed lever 36 pivotally mounted upon the hand lever 33. It will thus be readily understood from reference to Figures 1, 5 and 6 of the drawings, that in one position of the eccentric portion 32 of the shaft 27, the gear 29 is disengaged from the gear 30 on the motor shaft. By releasing the latch pin 34 and turning shaft 27 by means of lever 33, the eccentric portion 32 of said shaft operates to shift the sleeve 26, whereby the gear 29 is engaged with the gear 30 so that rotation may be transmitted to the countershaft through the drive chain connection 37 between the sprocket pinion 25 and the sprocket 21 in line therewith.

Each of the sprocket wheels 21 is provided in one side with a recess 38 to receive a split clutch band 39 which is keyed to the hollow counter-shaft 18. Upon one end of each section of the clutch band an expanding finger 40 is pivotally mounted intermediate of its ends as at 41, one end of said finger having a lug positioned between the opposed ends of the clutch band sections. The other end of the finger carries an adjustable screw 42 which is adapted for engagement by an annular chamfered face on a collar 43. This collar is connected by means of the pin 45 to an axially shiftable rod 44 extending through the hollow countershaft 18, said pin being longitudinally movable in the slots 46 formed in the wall of the counter-shaft, and having its ends terminating in an internal groove 43′ in the collar, whereby said counter-shaft may rotate freely with respect to the collar when the latter is in its neutral position.

One end of the rod 44 is adjustably connected with a lever 47 by means of the nuts 48 which are protected by a suitable guard 49 fixed to said lever. This lever at its upper end is pivoted to a bracket 50 fixed to the underside of the motor supporting table 11. It will be readily seen from this construction that when it is desired to impart a direct drive from the counter-shaft to the motor shaft, the lower end of the lever 47 is grasped and swung outwardly, thus shifting the rod 44 to the right and causing the collar 43 to bear against the screws 42 of the expanding fingers of the friction clutch associated with one of the sprocket wheels 21. Therefore, the counter-shaft will be rotated in the same direction as the motor shaft 15 through the drive chain connection 24. When it is desired to drive the counter-shaft in the reverse direction, the lower end of lever 47 is forced inwardly, thus shifting the rod 44 to the left and causing the collar 43 thereon to actuate the clutch associated with the other sprocket wheel 21 whereby the latter is locked to the counter-shaft so that upon actuating lever 33 to engage the gear 29 with the gear 30 on the motor shaft, rotation will be transmitted through said gears and through the drive chain connection 37 to the counter-shaft 18 in the reverse direction.

For the purpose of sustaining the motor supporting table, I provide a sectional rod 51, the upper section being pivotally connected as at 52 to the front edge of the table 11, while the lower section is pivotally connected as at 53 to the lathe bed 5. The other ends of the rod sections are provided with right and left hand threads respectively, for engagement with corresponding threads in opposite ends of a sleeve nut 54. It will be apparent that by the proper adjustment of this nut, the two rod sections can be drawn together or separated and the motor supporting table 11 with the counter-shaft suspended therefrom lowered or raised as may be found advisable in order to properly tension the belt connections between the pulley 20 on the counter-shaft and the pulley 8 on the lathe spindle.

The gearing and drive chain connections above the table 11 are also enclosed within a suitable housing 55.

In addition to the features above described, I also provide above the table 11 and at the rear side of the motor, a second supplementary counter-shaft 56. This shaft is journaled in suitable bearings 57 fixed to the table 11 and has a gear wheel 58 fixed thereon. With this gear wheel a power transmitting gear 59 is in constant mesh, the latter gear being jour-

naled upon one end of a bracket 60, the other end of which is split and loosely engaged upon a hub or projection 61 formed on one of the bearings 57. This split end of the bracket is adapted to be contracted by the screw 62 so that the parts thereof may be tightly clamped around and upon the bearing projection 61, thus retaining the gear 59 in an axially fixed position. Preferably, the bracket 60 carries a suitable guard 63 extending over the upper portions of the gears 58 and 59.

The rear wall of the housing 55 is provided with an opening therein, as shown at 64, through which the gear 59 extends in one position of the bracket 60 and engages the teeth of the gear 30 on the motor shaft, whereby rotation is transmitted from the motor shaft through gears 59 and 58 to the counter-shaft 56. The other end of this shaft has a belt pulley 65 fixed thereon from which the power may be transmitted by a suitable driving belt to a grinder or other machine which it is desired to operate at a high speed. When it is not desired to operate this auxiliary machine, the screw 62 may be loosened and the bracket 60 swung upon the bearing 57 to disengage the teeth of the gear 59 from the gear 30 on the motor shaft, after which the screw 62 is again adjusted to tightly clamp the bracket upon the shaft bearing and thus retain the gear 59 in its inoperative position.

From the foregoing description considered in connection with the accompanying drawings, the construction, manner of operation and several advantages of my present invention will be clearly understood. It will be seen that I have devised an individual motor drive for lathes and similar machines which will be of great utility and will enable a large number of such machines to be used in instances where sufficient power may not be available for the common operation of machines. It will also be noted that the improved mounting and arrangement of the motor and the counter-shaft upon the common adjustable supporting table provides a very compact relationship of the several parts so that the machine will occupy a minimum floor space. By means of the construction disclosed, the several necessary adjustments can be easily and quickly made, and it has been found in practice that such a combination and arrangement of the various elements is highly efficient and positive in its functional operation, and not liable to easily get out of order.

While I have herein shown and described a desirable embodiment of my present improvements, it will nevertheless be understood that the essential features thereof might also be exemplified in numerous other alternative constructions. I accordingly, reserve the privilege of resorting to all such legitimate changes in the form, proportion and relative arrangement of the several parts as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. Operating mechanism of the character described, comprising a counter-shaft, adapted to be operatively connected to a machine spindle, a motor geared to the counter-shaft, a common hingedly mounted support for the motor and the counter-shaft, adjustable means sustaining said support and operable to position the counter-shaft relative to the spindle and thereby adjust the driving connection between the counter-shaft and the spindle, a supplementary counter-shaft mounted upon said support, and manually operable devices for selectively establishing a driving connection between either of the counter-shafts and the motor whereby said counter-shafts may be independently or simultaneously operated.

2. In combination with a lathe, a support rigidly secured to one side of the lathe and extending upwardly above the lathe, a supporting table pivotally mounted along one edge on the upper end of said support and extending across to the other side of the lathe, an adjustable support connected to the other side of the lathe at its lower end and to the opposite edge of the supporting table at its upper end, a counter-shaft carried by said support, driving means for said counter-shaft, and means operatively connecting the countershaft with said lathe spindle.

3. In combination with a lathe, drive means for the lathe spindle comprising, a support rigidly secured to one side of the lathe and extending upwardly above the lathe, a motor supporting table pivotally mounted on the upper end of said support and extending across to the other side of the lathe, an adjustable support connected to the other side of the lathe at its lower end and to the opposite edge of the supporting table at its upper end, a motor and transmission gearing mounted on the upper side of said motor supporting table, a counter shaft and clutch mechanism mounted on the lower side of said motor supporting table, driving means between the motor and transmission gearing and said countershaft and driving means between said countershaft and said lathe spindle.

4. In combination with a lathe, a support rigidly carried by one side of the lathe, and extending upwardly above the lathe, a supporting table pivotally mounted on the upper end of the upwardly extending portion of the support, a driven shaft carried by the rigid support, a motor, a counter-shaft, and a reversing mechanism carried by the table, a driving belt connecting the counter-shaft and the driven shaft, and an adjustable support connecting the rigid support with the table on the side opposite its pivotal connection, whereby the table is lowered or raised for adjusting the same to or from the driven

shaft, for tightening or loosening the drive belt.

5. In combination with a lathe having a driven shaft with a driven pulley thereon, a rigid support extending upwardly at one side of and above the lathe, a table pivoted to the support, a motor on the table, a counter shaft with a drive pulley carried by the table and connected to the motor for adjustment as a drive unit therewith upon the swinging of the table, a change speed device on the table between the counter shaft and the motor and comprising part of said drive unit, a belt connecting the pulleys of the lathe driven shaft and the counter shaft, and adjustable bracing means for supporting the table and adapted for adjustment to tilt the table and vary the tension of the belt.

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

HUBERT DALTON.