Dec. 17, 1935. J. J. O'BRIEN 2,024,302

MOTOR MOUNTING

Filed Dec. 8, 1933 3 Sheets-Sheet 1

Fig. 1.

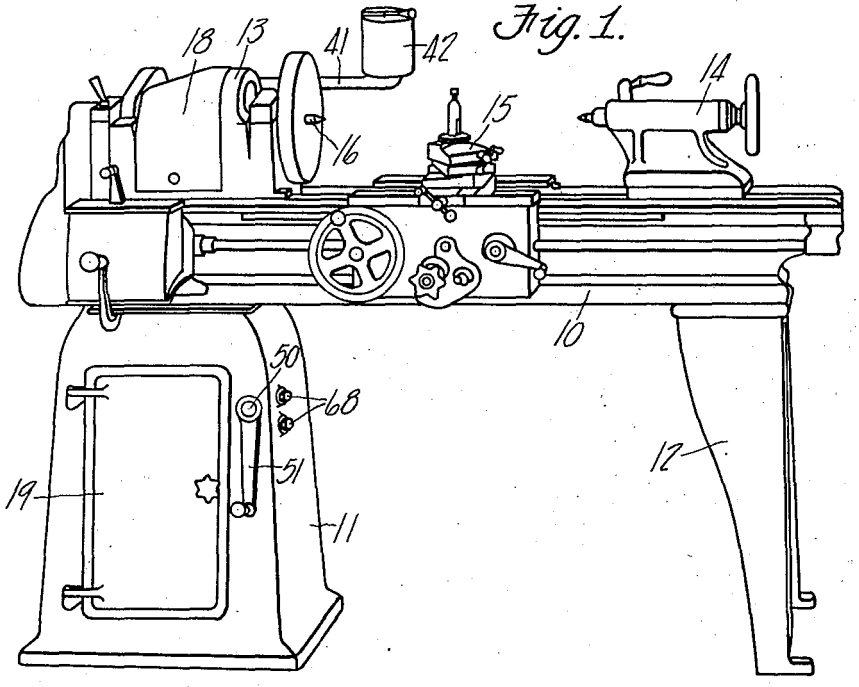
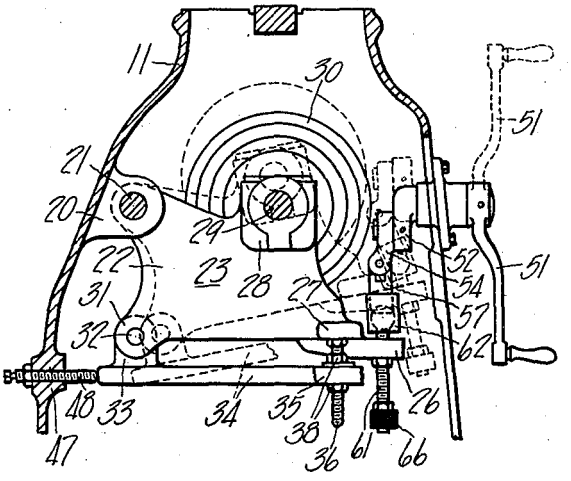


Fig. 4.



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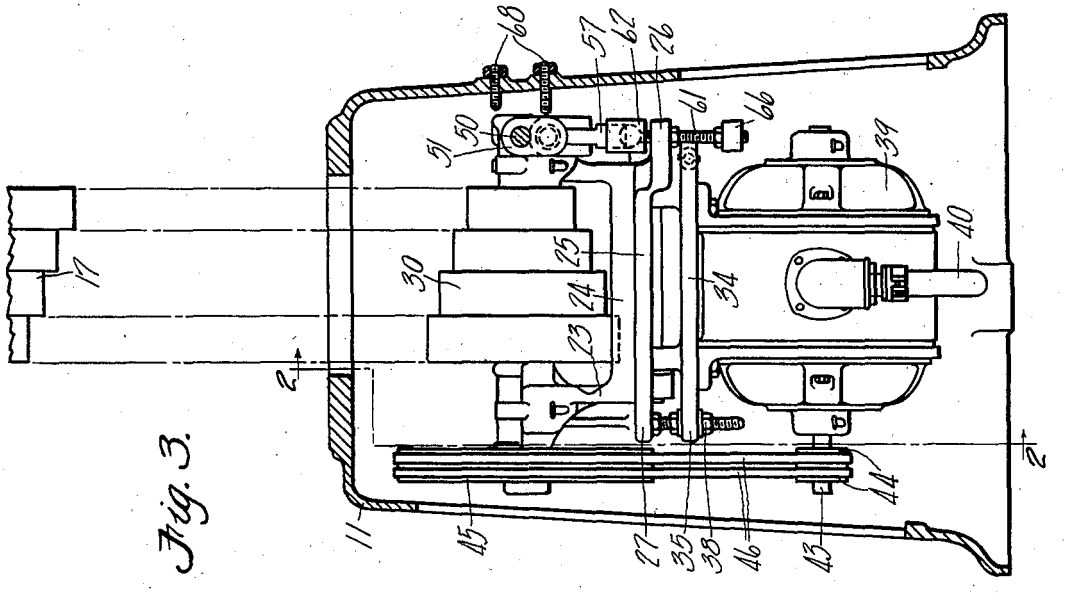

Fig. 3.

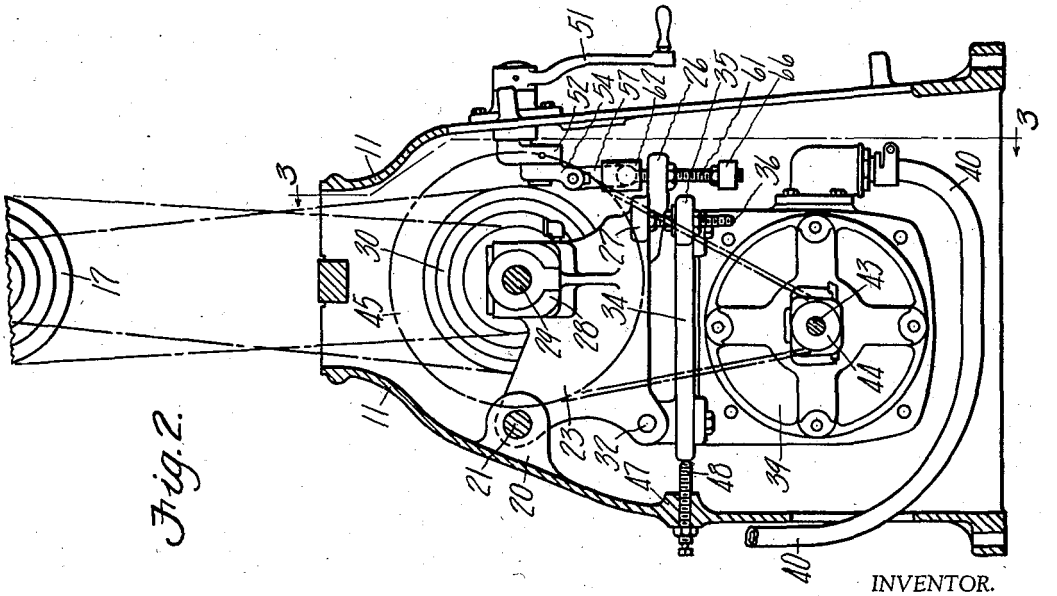

Fig. 2.

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Fig. 7.

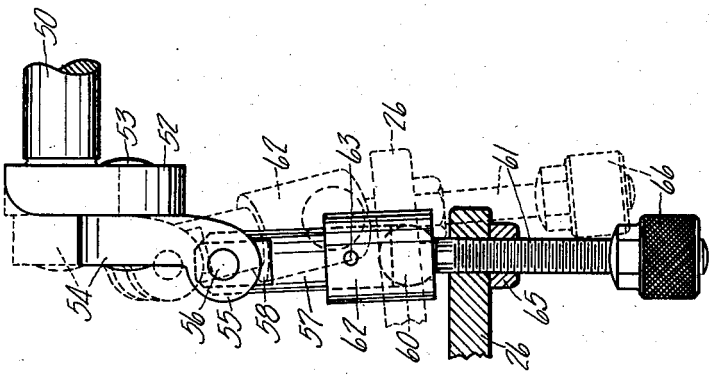


Fig. 6.

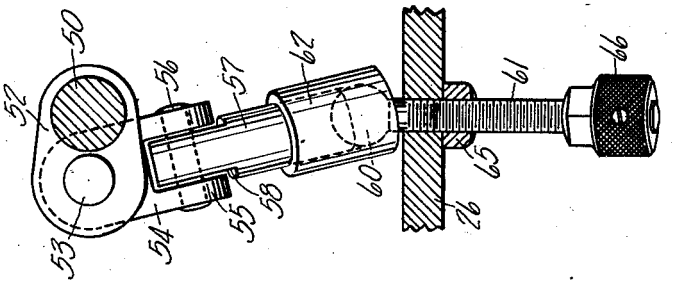
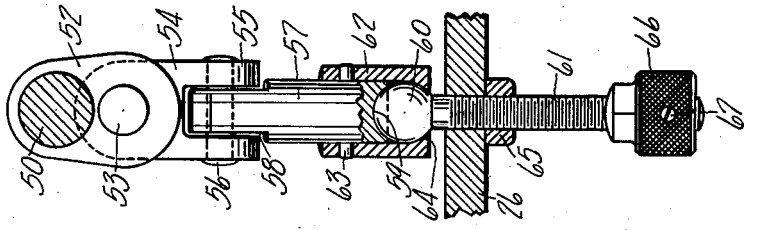


Fig. 5.



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Patented Dec. 17, 1935 2,024,302

UNITED STATES PATENT OFFICE

2,024,302

MOTOR MOUNTING

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Application December 8, 1933, Serial No. 701,491

9 Claims. (Cl. 74—242.13)

This invention relates to a motor mounting, and particularly to a motor mounting for a belt-driven lathe.

The primary object of the invention is to provide novel means for applying and releasing tension on the drive belt.

A further object is to provide means by which the tension on the drive belt may be varied in micrometric steps.

A further object is to provide crank-operated belt adjusting means including a universal joint.

A further object is to provide belt tensioning means capable of adjustment to vary the tension on a drive belt in a wide range from one ounce to many pounds.

With the above and other objects in view, the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:

Figure 1 is a perspective view of the lathe.

Figure 2 is a fragmentary transverse vertical sectional view of the lathe taken on line 2—2 of Figure 3 and illustrating the driving mechanism thereof.

Figure 3 is a longitudinal vertical sectional view taken on line 3—3 of Figure 2.

Figure 4 is a fragmentary transverse sectional view taken on line 2—2 of Figure 3, and illustrating in dotted lines the drive pulley in belt releasing position.

Figure 5 is a view in front elevation, with parts shown in section, of the belt tensioning means in tension-applying position.

Figure 6 is a view in front elevation of the belt tensioning means in an intermediate partially actuated position.

Figure 7 is a view, in side elevation, of the belt tensioning means in tension-applying position, and illustrating in dotted lines a partially actuated position thereof.

Referring to the drawings, which illustrate the preferred embodiment of the invention, the numeral 10 designates the lathe bed which is supported by a cabinet 11 at its drive or head end and by legs 12 at it tail end. A head stock 13, tail stock 14, and tool carriage 15 are mounted on the lathe bed. The head stock spindle 16 is driven by a cone pulley 17 which is accessible through a hinged cover 18. The cabinet 11 is provided with an access door 19 in its front.

Brackets 20 are carried by the rear wall of cabinet 11 adjacent the upper end thereof, and these brackets mount a shaft 21 extending horizontally in spaced relation to the rear of cabinet 11. A cradle 22 is journaled on shaft 21, and comprises spaced opposed vertical plates 23 interconnected by a transverse web 24 extending between said plates adjacent their lower ends. A horizontal plate 25 is carried by the lower forward ends of plates 23 and carries a forwardly extending downwardly off-set portion 26 adjacent one plate 23 and a laterally projecting portion 27 adjacent the other plate 23. Each of the plates 23 carries a journal member 28 at its upper end in forwardly spaced relation to shaft 21. Journal members 28 carry a shaft 29 which mounts a cone pulley 30 positioned between plates 23 of the cradle.

Each of the plates 23 of the cradle carries a journal portion 31 at its lower rear portion, and these portions 31 mount a shaft 32 which extends parallel to shaft 21. Shaft 32 journals spaced ears 33 projecting upwardly from a plate 34 which it supports and journals relative to cradle 22. Plate 34 carries a lateral projection 35 at one side of the forward end thereof, which projection has an opening therein through which a threaded member 36 depending from portion 27 of the cradle loosely extends. Nuts 38 threaded on member 36 bear on the upper and lower sides of projection 35 of plate 34 to fixedly position said plate 34 relative to cradle 22 in any adjustment desired. A motor 39 is carried by plate 34 at the lower side thereof and has a flexible conduit 40 secured thereto and connected with rigid tube 41 carried by the lathe above and rearwardly of the lathe bed. Conduits 40 and 41 carry the lead wires (not shown) of the motor circuit, and tube 41 carries a switch 42 which controls the motor circuit. The shaft 43 of motor 39 mounts a double pulley 44, and shaft 29 of cradle 22 carries another double pulley 45. A pair of V-belts 46 connect said pulleys to impart driving rotation from motor 39 to shaft 29 of cone pulley 30. A boss 47 is formed in the rear of cabinet 11 opposite plate 34 and carries a set screw 48 which bears upon said plate to limit the pivotal movement of cradle 22 and the motor mounting about shaft 21 in one direction.

A crank shaft 50 is journaled in cabinet 11 at the front thereof and above the normal operative position of portion 26 of plate 25. A crank handle 51 is carried by one end of said shaft 50 exteriorly of the cabinet. Integrally formed with shaft 50 at its opposite end is a crank arm 52. A pin 53 is carried by the crank arm in spaced relation to

shaft 50 and journals a plate 54 at one end thereof, the other end of said plate being bifurcated at 55 whereby said plate forms a clevis, said bifurcated portion 55 carrying a pin 56 which is disposed at right angles relative to the pin 53. A cylindrical member 57 is journaled on the pin 56 between forks 55 and is provided with opposed cut-away portions 58 at its upper end. The lower end 59 of cylinder 57 is of concave formation and seats on the spherical head 60 of a threaded shaft 61. A collar 62 is fixedly secured to the lower end of cylinder 57 by pins 63, and encompasses said cylinder and spherical head 60, said collar having an inwardly directed lip 64 formed at its lower end to form a socket which engages and supports said spherical head 60. Shaft 61 extends through and interengages with a threaded opening formed in the portion 26 of plate 25 and has a nut 65 threaded thereon which underlies said plate portion and serves as a lock nut. On the lower end of shaft 61 is mounted a knurled nut 66 which is fixed to said shaft by a set screw 67. A pair of bolts 68 are carried by the cabinet adjacent crank shaft 50 and form stops engaged by the parts of the crank-operated structure, heretofore described, in the operation thereof.

In the operation of the lathe, the crank handle 51 is positioned in downwardly extending position and slightly inclined from the vertical toward the adjacent side wall of cabinet 11 to position crank arm 52 in engagement with the lower stop screw 68. In this position the crank operated parts are locked in extended dead center or slightly overcenter position, as illustrated in Figures 2 and 3, to urge plate 34 against stop screw 48 and thus hold cradle 22 locked in its lowermost position. It will be noticed that the parts of the crank operated mechanism each impart a downward pressure which shaft 61 applies to cradle plate portion 26. Assuming that nuts 38 on shaft 36 have been properly adjusted to apply the desired tension on belts 46, the device is in operative position to drive the lathe through a suitable belt connecting the cone pulleys 17 and 30 and passing through the cabinet and the ways of the lathe bed. When it is desired to release the tension on this drive belt, as to permit of changing of the position of the belt on the cone pulleys, crank 51 is rotated to an upwardly extending position at dead center or slighty over-center to position crank arm 52 in engagement with the upper stop screw 68. By this operation the crank operated parts assume the position illustrated in dotted lines in Figure 4, and upwardly pivot cradle 22 to release the belt connecting the cone pulleys, the over-center engagement of arm 52 with screw 68 maintaining or locking the cradle in its upwardly pivoted position. It will be noted that this pivoting of cradle 22 alters the relation of cradle plate portion 26 with respect to crank shaft 50 both vertically and laterally; and that to compensate for this change in relationship of these parts the interconnection of collar 62, spherical head 61 and concaved cylinder 57 forms one universal joint, and the interconnection of cylinder 57 with crank arm 52 through clevis plate 54 by means of the relatively perpendicularly disposed pins 53 and 56 forms a second universal joint. A free movement of the crank operated parts is thus afforded.

Referring again to the operative position of the crank and cradle, it will be evident that, for various types of work, variations in the adjustment of the cradle to vary belt tension are necessary. This construction provides, by threaded shaft 61, means by which this adjustment may be readily made. Thus a fractional turn of said shaft will slightly vary this tension and enables micrometric adjustments to be effected, while large adjustments may be made by turning the shaft a number of complete revolutions. These adjustments, particularly those to increase belt tension, are best made when the cradle is upwardly pivoted, and serve to vary the distance between the crank shaft and the operative position of the cradle plate portion 26 and thereby to shift the limits of the path of pivotal movement of the cradle. After the adjustment of shaft 61 has been effected, the setting of set screw 48 is changed to render it operative for the new adjustment.

While the operation and adjustment of the set screw 48 has been described as to provide engagement with the plate 34 when the cradle is in belt tension applying position, the adjustment thereof being made with each adjustment of the crank-operated means; the screw 48 may also be used to serve as a stop preventing application to the belt of a tension exceeding that which it will satisfactorily sustain. In this use the screw 48 is set to engage and stop downward pivoting of the cradle at the position at which it applies maximum operative belt tension. Thus, for example, if the belt will sustain, in practical use, a tension of 1000 pounds, the screw is set to engage and stop the cradle in a position in which it applies a tension of 1000 pounds to the belt. This setting may be considered permanent, and is not altered during normal adjustment of the tension applying means. Thus the screw 48 will not be engaged by the plate 34 when the cradle is in position to apply a tension of less than the permissible maximum; but if the tension applying means is inadvertently adjusted to apply to the belt a tension exceeding the permissible maximum, the stop prevents operation of the tension applying means to an overcenter locked position in tension applying direction, and thus serves to warn or signal the operator that the adjustment of said tension applying means exceeds the permissible limit. Use of the screw 48 in this manner has been found to be advisable by reason of the fact that the mechanical application of belt tension obtained in this device, effected by great leverage, renders possible the breaking of a belt when the tension applying means is improperly adjusted.

It will thus be seen that there is provided in this structure a belt tension releasing means operable from the exterior of the lathe, and means providing a wide range of adjustment and capable of micrometric variations of adjustment of the tension exerted on the belt drive.

The invention having been set forth, what is claimed as new and useful is:—

1. The combination with a belt driven lathe including a pivoted pulley support, of extensible means for positively positioning said support to positively tension the drive belt comprising a crank, a clevis pivoted to said crank, a member pivoted to said clevis including a socket, a shaft engaging said support, and a ball carried by said shaft and mounted in said socket, and a stop engageable by said crank to stop said means in extended belt tensioning position, said shaft being adjustable relative to said support to vary the position of said support relative to said crank and thereby vary the tension applied to said drive belt.

2. The combination with a belt driven lathe having a cabinet, and a pulley support pivoted in said cabinet, of means carried by said cabinet for positively positioning said support to positively tension the drive belt including a crank, a clevis pivoted to said crank, a socket pivoted to said clevis, a shaft adjustably engaging said support, a ball carried by said shaft and mounted in said socket, a stop carried by said cabinet and engageable with said crank to position said crank in lower dead center position thereby locking said positioning means in tension applying position, and a second stop carried by said cabinet adjacent the pivot of said support and engageable by said support to limit tension applying movement of said positioning means.

3. The combination with a lathe having a headstock pulley, a cabinet, a pulley support pivoted in said cabinet, and a belt running over said pulleys of crank-operated means carried by said cabinet for shifting said support to selectively apply or release tension on said belt, and a stop carried by said cabinet and engaged by said crank to stop said crank in lower dead center position and lock said crank and crank-operated means against movement in tension-applying position.

4. The combination with a belt driven lathe having a pivoted driving pulley support, of means for shifting said support against the tension of the belt including a universal joint, means for stopping said first named means in belt tensioning positioning and means for varying the limits of pivotal movement of said support including a shaft having threaded engagement with said support and operatively associated with said joint, said last named means being operable to vary the tension applied to said drive belt by said first named means.

5. The combination with a belt driven lathe having a pivoted driving pulley support, of means for shifting said support against the tension of the belt including a ball and a socket receiving said ball, and means for varying the limits of pivotal movement of said support including a shaft having threaded engagement with said support and carrying said ball, said last named means being operable to vary the tension applied to said drive belt by said first named means.

6. The combination with a belt driven lathe having a pivoted driving pulley support, of folding means for shifting said support to selectively apply or release tension of the belt, a stop limiting movement of said support in one direction, said folding means being actuable to dead center position against the tension of the belt to lock said support in tension-applying position, and a second stop limiting folding movement of said means in opposite over-center position to lock said support in tension-releasing position.

7. The combination with a belt driven machine having a pivoted driving pulley support, of folding means for shifting said support to selectively apply or release tension of the belt, and a stop, said folding means being extensible to dead center position engaging said stop against the tension of said belt to lock said support in tension-applying position.

8. The combination with a belt driven lathe having a pivoted driving pulley support, of means for positively positioning said support in either of two positions comprising an operating member, a socket, an intermediate member pivoted to said operating member and to said socket for movement about axes disposed angularly relative to each other, a member engaging said support and having a spherical head disposed in said socket, and a pair of stops each engaged by said operating member in one of said positions, movement of said means to one of said positions being against the tension of the belt.

9. The combination with a lathe having a headstock pulley, a cabinet, a cradle pivoted in said cabinet, a pulley carried by said cradle, and a drive belt running over said pulleys, of a crank positioned exteriorly of said cabinet, and crank operated means comprising a crank arm within the cabinet, a clevis pivoted to said crank arm, a member pivoted at one end to said clevis and having its opposite end concaved, a shaft having a threaded engagement with said cradle, a ball carried by said shaft and seated in the concavity of said member, and a socket carried by said member and encompassing said ball, said crank operated means being extensible to depress said cradle against the tension of said drive belt, and a stop carried by said cabinet and engaged by said crank arm to stop said means in extended position, rotation of said shaft varying the spacing of said ball and said cradle to vary the tension applied to said belt upon extension of said means.

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