May 27, 1947. C. S. HALL 2,421,200

LATHE DOG

Filed March 24, 1944

FIG. 1

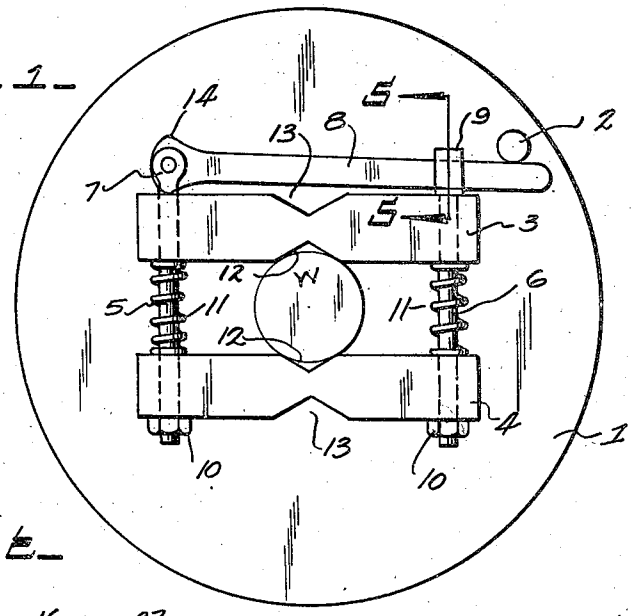


FIG. 2

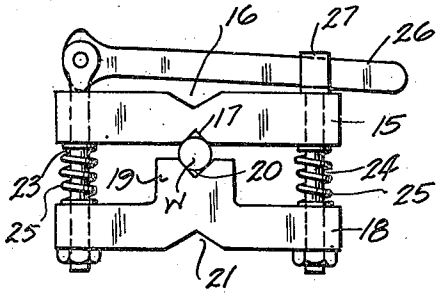


FIG. 4

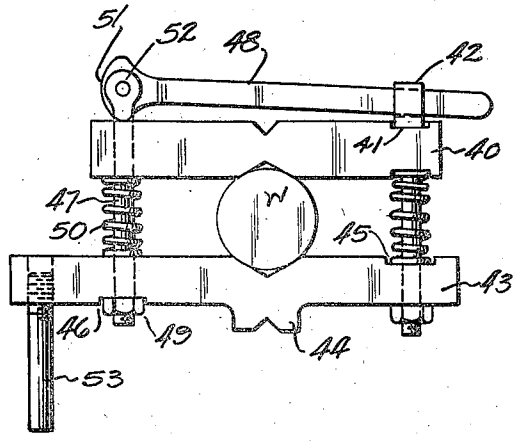


FIG. 3

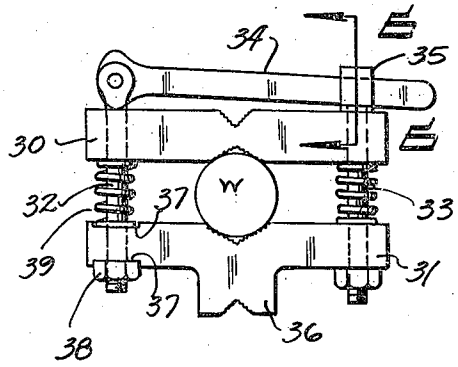


FIG. 5

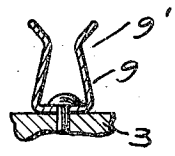
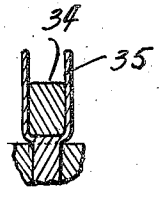


FIG. 6



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2,421,200

UNITED STATES PATENT OFFICE

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LATHE DOG

Clinton S. Hall, Farmington, Mich.

Application March 24, 1944, Serial No. 527,969

3 Claims. (Cl. 82—41)

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The present invention pertains to a novel lathe dog and consists of improvements in the device shown in my co-pending application, Serial No. 481,505, filed April 1, 1943.

The lathe dog in said application includes a pair of gripping bars yieldingly mounted on bolts and bearing against one of the bars. The lever and its immediately associated accessories threw the dog out of balance, and one of the objects of the invention is to restore the balance.

This object is accomplished generally by means of a counterweight carried by the bar more remote from the lever. Moreover, the latter bar is reversible and is formed with a work-engaging seat in the surface opposite the weight as well as in the free end of the weight itself. The seats are of unequal size corresponding with seats in opposite surfaces of the other bar. Thus, the reversibility of the bars to present unequal pairs of seats for large or small work is not impaired by the presence of the counter-weight.

Another object of the invention resides in the provision of a retainer or clip to receive the clamping lever and thus hold it from swinging laterally and loosening the dog. Still another object is to provide in one of the bars a seat for the nut mounted on the bolt that carries the lever. Thus this bolt can be adjusted by turning the lever, since the nut is held in its seat. By the provision of a pressure cam on each side of the lever at its pivoted end, a half-turn adjustment of the bolt becomes possible.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing in which

Figure 1 is an elevation of the face plate of a lathe and of the dog secured on the work;

Figure 2 is an elevation of a modified form of lathe dog;

Figure 3 is an elevation of a modified dog in a different adjustment with a modified form of lever retaining clip.

Figure 4 is an elevation of still another modification;

Figure 5 is a section on the line 5—5 of Figure 1 and,

Figure 6 is a section on the line 6—6 of Figure 3.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

In Figure 1 is shown the face plate 1 of a lathe, adjacent to which is centered the work W on a center (not shown) in a manner well known in the art as shown in my co-pending application.

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A pin 2 is carried by the face plate for engaging and driving the work through lathe dog, as will presently be shown.

The lathe dog includes a pair of bars 3 and 4 joined at their ends by two bolts 5 and 6 passed slidably therethrough. The bolt 5 has its upper end flattened at 7 above the upper bar 3 and has a locking lever 8 pivotally attached thereto. The other end of the lever is received in a U-shaped clip 9 suitably attached to the upper end of the bolt 6 by a swivel connection, by welding, or by other suitable means. The lower ends of the bolts are retained by nuts 10, and the bolts are normally spread by coil springs 11 thereon between the bars 3, 4. The clip may have a restricted neck 9' as shown in Figure 5.

One surface of each bar is formed with a V seat 12 adapted to engage the work W. The opposite surface of each bar is formed with a V seat 13 of a larger size. These seats are adapted to engage work of larger diameter and are brought inward by removing the nuts 10 and reversing the bars.

The pivoted end of the lever 8 has a cam 14 formed on each side of the pivoted axis. Either cam tightens the bars against the work on swinging the lever into the clip 9, after preliminary adjustment of the springs 11. The double cam arrangement has several advantages. The life is double that of a single cam, or the wear is reduced to half. In the raised or vertical position the lever is engaged by the bar 3 under the pressure of the nearer spring 11 and therefore will not drop to either side, so that the dog remains loose until positively tightened by swinging the lever by hand. Finally, in tightening or loosening one of the springs 11 by turning the bolt 5 at the lever, a half turn adjustment can be made, since a cam 14 is available on either side of the lever. The pin 2 engages the free end of the lowered lever, and the clip 9 prevents the lever from swinging laterally.

In the modification shown in Figure 2, one of the bars 15 has seats 16 and 17 of different sizes on opposite surfaces. The other bar 18 has a riser 19 at the center of one surface, with a seat 20 formed therein corresponding to the seat 17. The other surface of the bar 18 has a seat 21 corresponding to the seat 16.

The bars are joined by bolts 23 and 24 surrounded by springs 25 between the bars. A lever 26 is pivotally attached to the bar 23 and received in a clip 27 on the bar 24, as previously set forth.

For small work the riser 19 is positioned inward and the smaller seats 17 and 20 are en-

gaged with the work. For larger work the bars are reversed, bringing the riser 19 outward, as in Figure 3, and presenting the larger seats to the the work.

The size of the riser is such that the weight of the assembly is equally divided on opposite sides of a plane passed between the bars and through the center of the work. In other words, the riser portion is approximately equal in weight to the lever 26. The dog is thereby balanced about its center of rotation, resulting in balanced moments during rotation. This is an important consideration at high speed since an unbalanced condition would produce excessive wear in the lathe.

The modification shown in Figure 3 differs principally in the locking clip for the lever. The dog consists of a pair of bars 30, 31 joined by bolts 32, 33, with a lever 34 pivoted on the bolt 32. The clip 35 is a simple U-shaped member having a swivel mounting on the bolt 33. The bar 31 has a balancing riser 36 as previously described.

One end of the bar 31 has seats 37 formed in opposite surfaces to receive the nut 38 on the lower end of the bolt 32 in either adjustment of the bar. With the nut thus held against turning, the entire tensioning of the spring 39 on the bolt 32 can be accomplished by turning the lever 34.

In Figure 4 the upper bar 40 is formed with a notch 41 for the lever retaining clip 42. The lower bar 43 has a balance riser 44 and is formed with notches 45, 46 on opposite surfaces and at opposite sides of the riser. Whether the riser is in the inward or outward position, one of the notches receives the bolt 47 carrying the lever 48. The nut 49 on the bolt is of course seated in the downwardly facing notch, and the bolt 47 can be turned to adjust the spring 50 by merely rotating the lever 48. As previously indicated, a half turn adjustment of the bolt may be made by reason of the cams 51 on both sides of the pivoted axis 52 of the lever.

The V-notches in the various bars may be serrated, if desired, for better gripping. A pin 53 extends from the bar 43 for engagement by the driving pin of the face plate, as an alternative to driving on the clamping lever.

Although specific embodiments of the invention have been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:

1. A driver comprising a pair of parallel bars, a pair of bolts passed slidably through the ends thereof, a spring on each bolt between said bars and adapted to spread the bars, a lever pivoted on an end of one of said bolts, and a retainer for said lever on the corresponding end of the other bolt, said retainer being resilient and having a restricted neck of less internal width than the entering thickness of said lever.

2. A driver comprising a pair of parallel bars, a pair of bolts passed slidably through the ends thereof, a spring on each bolt between said bars and adapted to spread the bars, a lever pivoted on an end of one of said bolts, the bar more remote from said lever having work-engaging seats formed in the center of its opposite surfaces and nut-receiving seats in said surfaces and diagonally disposed relatively to either of the work-engaging seats, the nut-receiving seats being positioned for penetration selectively by the threaded end of the bolt carrying said lever and adapted to receive a nut threaded on the last named bolt, whereby the spring on said bolt may be adjusted by rotating said lever on the axis of said last named bolt.

3. A driver comprising a pair of parallel bars, a pair of bolts passed slidably through the ends thereof, a spring on each bolt between said bars and adapted to spread the bars, a lever pivoted on an end of one of said bolts, and a counterweight carried by the bar more remote from said lever and adapted to balance said lever, said counter-weight being disposed at the center of the last named bar and having a work-engaging seat formed in its free end, the opposite surface of said bar being also formed with a work-engaging seat, opposite surfaces of said bar being formed with nut-receiving seats diagonally disposed relatively to either of the work-engaging seats, the nut-receiving seats being positioned for penetration selectively by the threaded end of the bolt carrying said lever and adapted to receive a nut threaded on the last named bolt, whereby the spring on said bolt may be adjusted by rotating said lever on the axis of said last named bolt.

CLINTON S. HALL.

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