

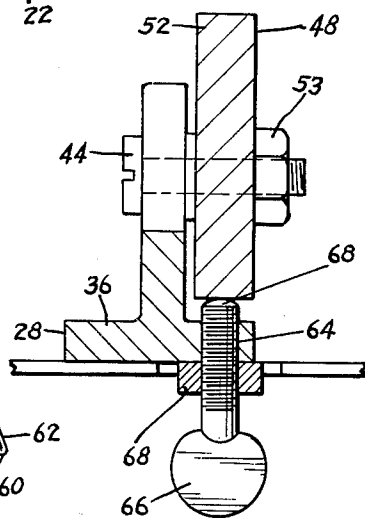
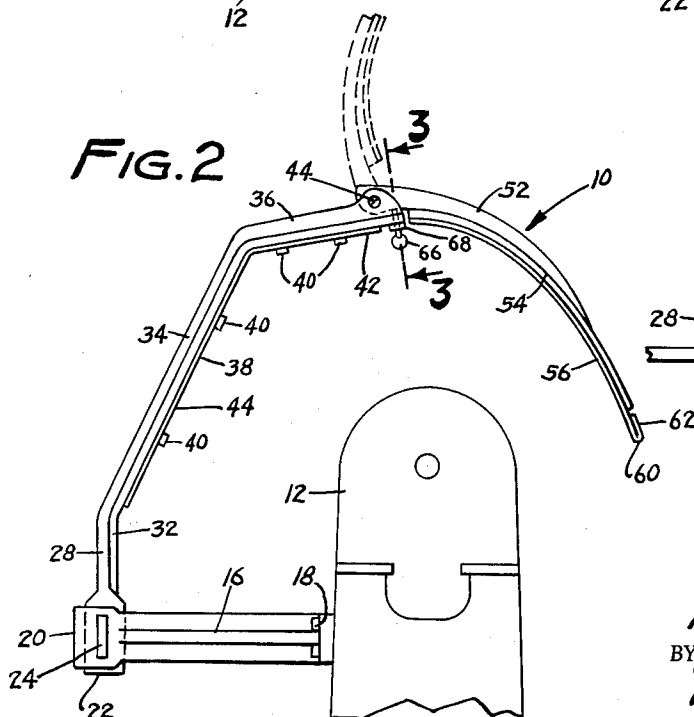
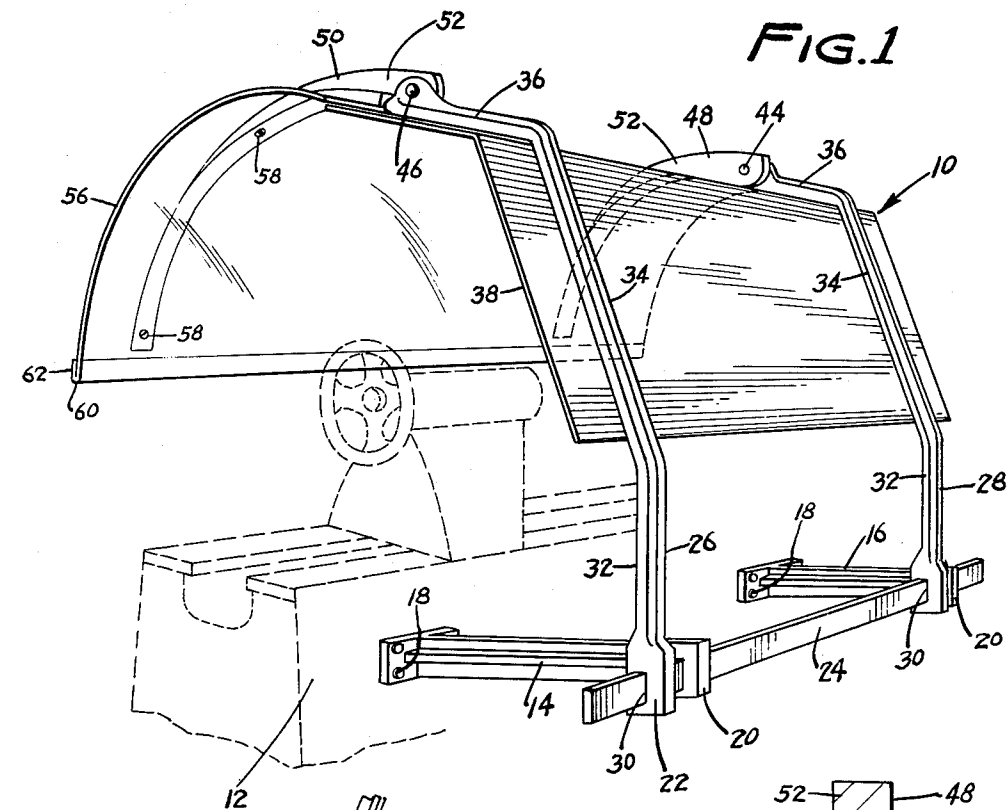
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SAFETY SHIELD FOR WOOD AND METAL LATHES

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SAFETY SHIELD FOR WOOD AND METAL LATHES

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This application is a continuation-in-part of application Serial No. 178,532, filed March 7, 1962, now abandoned.

The present invention relates to the machine tool art and more particularly to safety shields used for protecting the operator of a machine tool such as a lathe.

A number of safety shields have been previously proposed for use with machine tools such as lathes. These prior devices have been to some extent ineffective in operation or were expensive to manufacture. Most of the previous shields of the type described could not be shifted longitudinally of the lathe bed. As a result, a part of the work would frequently extend past the end of the shield. When such movement was permitted a relatively complicated support means was required thus increasing the cost of the shield.

In other devices of the type described, the operator's field of vision is limited and often a substantial portion of the object upon which work is performed is obstructed by a part of the shield. In still other devices, a relatively heavy and bulky frame is required around the outer portion of the shield, thus causing the shield to be heavy as well as partially obstructing the operator's vision.

A further defect of many of the previously proposed shields of the type described results in the fact that the hinge used for supporting the movable part of the shield is mounted a substantial distance toward the rear of the lathe from the lathe bed. For this reason, the hinged portion of the shield must extend forwardly across the top of the lathe bed and then downwardly across the front part of the lathe. As a result, it has been difficult to provide a firm and durable support for the shield and frequently necessary to use an auxiliary support for the shield along its forward edge even though a support at this point tends to be in the way of an operator.

In view of these and other defects of the prior devices, it is one object of the present invention to provide an improved shield of the type described having a relatively large transparent shield member which will protect the operator from flying objects but yet will have little tendency to obstruct the operator's view of the work.

Another object of the present invention is the provision of an improved shield which is given more reliable support than prior shields of the type described through the use of a hinge positioned almost directly above the workpiece which is to be enclosed by the shield.

Yet a further object of the present invention is the provision of an improved safety shield of the type described including a relatively large and transparent shield member the inward aspect and edges of which are fully exposed thereby allowing the inward surface of the shield to be easily and quickly cleaned.

A further object of the present invention is the provision of an improved shield of the type described including a relatively large upwardly and rearwardly extending transparent shield member pivotally connected at its upward end to support members positioned substantially directly above the workpiece and a second stationary shield positioned rearwardly of the pivot to prevent objects from being thrown rearwardly of the workpiece.

Still another object of the present invention is the provision of an improved shield of the type described includ-

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ing selectively operable means for changing the resting position of the shield.

Other objects of the invention will become apparent as the description proceeds.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

FIGURE 1 is a perspective view of one form of the present invention;

FIGURE 2 is an end elevational view of the apparatus of FIGURE 1; and

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

Referring now to the drawings there is shown a safety shield 10 according to the present invention. The shield 10 is supported above and in spaced relationship from a power tool such as a lathe 12 by means of a pair of rearwardly extending parallel and longitudinally spaced brackets 14 and 16. The brackets 14 and 16 are rigidly secured to the rearward surface of the lathe 12 by any suitable fastener such as bolts 18. At the outward end of each of the brackets 14 and 16 is provided a support head 20. Each support head 20 is provided with a vertically disposed transverse slot 22 which is adapted to receive a longitudinally slidable support member such as a bar 24. The bar 24 can be slid longitudinally of the lathe 12 through the openings 22 as required to change the position of the shield 10. Extending upwardly from the bar 24 is a pair of support arms 26 and 28 each including an opening 30 in its lower end which is slidably mounted over the support bar 24. The support arms 26 and 28 include three major sections the first of which is a vertically disposed lower section 32, next an inclined outer section 34 which extends toward the central axis of the lathe 12, i.e., forward, and finally an upper portion 36 which extends forwardly in an almost horizontal plane to the approximate center of the lathe 12.

As clearly shown in the figures, a rear shield member or plate 38 is rigidly affixed to the lower surfaces of the arms 26 and 28 by suitable fasteners such as screws 40. The plate 38 is divided into two portions, an upper portion 42 and a lower portion 44, both of which are inclined with respect to the horizontal thereby tending to deflect material which has been thrown from the lathe 12 downwardly and away from the operator rather than forwardly or upwardly as might occur, for example, in the event that the shield 48 were positioned in a vertical plane. In this way, the apparatus provides increased safety for the operator and at the same time prevents injury to persons located on the opposite side of the lathe from the operator. At the same time, a hinge means to be described hereinafter for supporting the shield can be mounted well forwardly thus increasing the rigidity and durability of the device.

As can be best seen in FIGURES 2 and 3, a hinge means comprising a pair of coaxial bolts 44 and 46 are mounted in a horizontal plane at the free end of each of arms 26 and 28. Mounted upon the bolts 44 and 46 respectively is the vertical web of a pair of shield support members 48 and 50. The members 48 and 50 are secured in position by means of suitable fasteners such as nuts 53. As best seen in FIGURES 1 and 2, the shield support members 50 and 48 are generally arcuate in shape and extend forwardly and downwardly from the bolt 44 and 46. Each of the support members 48 and 50

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include a vertically disposed central web portion 52 which tapers toward the lower end thereof and a horizontally disposed web portion 54 to which a front shield member 56 is secured by fasteners such as screws 58 (FIGURE 1).

The front shield 56 is arcuate in shape and corresponds in curvature with the lower surface of each of the support members 48 and 50. As clearly shown in FIGURE 1, each end of the shield 56 extends somewhat beyond the respective support members 48 and 50 thereby providing protection over a substantial portion of the lathe bed. Additional strength and rigidity is provided for the lower edge of the shield 56 by the provision of an upward bend at 60 to form an overlapping strip of shield material 62 which extends along the lower edge thereof. While the material 62 reinforces the lower edge of the shield 56, it is formed from the transparent material of the shield 56 itself and therefore will not materially obstruct the view of the operator. The shield 56 can be formed from a variety of materials but is preferably composed of a strong transparent and semiflexible material such as polymethylmethacrylate resin. Other suitable material from which the shield 56 can be formed will be apparent to those skilled in the art.

As best seen in FIGURES 2 and 3, each of the support arms 28 and 26 is provided with a vertical bore 64 at its outward end within which is threaded a thumb screw 66, only one of which is shown. The thumb screw 66 is in each case positioned slightly forward of the screws 44 and 46 and is in vertical alignment with the vertical web 52 of each of members 48 and 50 as clearly shown in FIGURE 3. The upward end 68 of each screw thus abuts against the respective support members 50 and 52 a short distance forwardly from their point of pivotal support. Threaded upon the lower portion of each of the screws 66 is a nut 68 for locking the thumb screws 66 in selected positions. By changing the positions of the thumb screws 66, the resting shield 56 can be changed as desired. Thus, by raising the screws 66, the free edge of the shield 56 can be elevated when the shield is in the operating position shown in solid lines in FIGURE 2. By lowering the screws 66, the free edge of the shield 56 can be lowered correspondingly.

When it is desired to use a lathe upon which the invention is mounted, the shield 56 is placed in the solid line position of FIGURES 1 and 2. When it is desired to either place material in the lathe or remove material therefrom, the shield 56 can be pivoted upwardly to the dotted line position of FIGURE 2 and will remain in this position until lowered manually to the solid line position.

A number of models of the present invention were manufactured and placed in use on lathes which are employed in instruction of high school students. The shields proved to be rugged in construction and reliable in operation. A rear shield member 38 not only protected those standing behind the lathe 12 but also served to deflect downwardly material which was thrown from the lathe 12 rather than deflecting it forwardly or upwardly as in the case of a vertically disposed shield member. Since the support members 48 and 50 are mounted outside of the shield member 56 it was found that the lower or inward surface thereof was unobstructed and as a result could be very easily and quickly cleaned when necessary.

Furthermore, since the hinge means comprising the screws 44 and 46 is mounted substantially directly above the bed of the lathe 12, the shield was found to be rugged in construction and more durable than devices in which the shield itself is pivotally supported at a point below the lathe bed. Additionally, with the mounting bracket of the present invention, the shield support arms 26 and 28 can be shifted longitudinally so as to position the shield members 38 and 56 over either wood or metal lathes fitted with tapering devices, grinders or the like

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which are mounted in the opposite side of the head stock from the lathe bed.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

I claim:

1. A safety shield for a lathe comprising in combination, bracket means adapted to be secured to the rearward surface of said lathe and to extend laterally therefrom, upwardly extending support arms connected to said bracket means, said arms including inclined portions which extend upwardly and forwardly from the lower ends thereof toward a plane extending vertically through the center of said lathe, hinge means at the upward end of said support arms, a pair of longitudinally spaced shield support members connected to said hinge means for pivotal movement about a horizontal axis and extending forwardly and downwardly therefrom, a first shield extending between said support arms and being rigidly secured thereto and a second shield member formed from a transparent material and connected rigidly to the inward surface of said pair of shield support members.

2. The apparatus according to claim 1 wherein said support arms are longitudinally shiftable with respect to said lathe.

3. The apparatus according to claim 2 wherein the lower edge of said transparent shield member is bent upwardly against itself to provide reinforcement for said lower edge thereof.

4. The apparatus according to claim 3 wherein said first shield member is positioned on an inclined axis whereby material thrown from said lathe against the inward surface thereof will be deflected substantially downwardly.

5. A safety shield for a lathe comprising in combination, support means adapted to be secured to the rearward surface of said lathe and to extend from the surface thereof, upwardly extending support arms connected to said support means, a stationary shield formed from a sheet of strong impact resistant material positioned to extend longitudinally of the lathe and supported by said arms, said arms including portions for supporting the shield in an inclined positioned plane extending upwardly and forwardly from the support means toward a second plane extending vertically through the center of the lathe, hinge means at the upward end of said support arms, shield support means connected to said hinge means for pivotal movement about a horizontal axis and extending forwardly and downwardly therefrom, said shield extending between said support arms and being rigidly secured thereto and a second shield member formed from a transparent material and connected rigidly to said shield support means.

6. The apparatus according to claim 5 wherein said support arms are longitudinally shiftable with respect to said lathe.

7. The apparatus according to claim 5 wherein the lower edge of said transparent shield member is bent upwardly against itself to provide reinforcement for said lower edge thereof.

8. The apparatus according to claim 5 wherein selectively positionable stop means is mounted for movement on a line tangent to a circle concentric with the hinge for changing the position of said transparent shield member with respect to said hinge means whereby the free edge thereof can be raised or lowered as required.

9. A safety shield for a lathe comprising in combination, support means adapted to be secured to the rearward surface of said lathe, said support means extending rearwardly a substantial distance from the rearward surface of said lathe, upwardly extending support arms connected to the rearward ends of the support means to provide a substantial spacing between the lower ends of the support

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arms and the rearward surface of the lathe, a stationary shield formed from a sheet of strong impact resistant material positioned to extend longitudinally of the lathe and supported by said arms in an inclined plane extending upwardly and forwardly from the point of connection between the support arms and the rearward extensions toward a second plane extending vertically through the center of said lathe whereby objects thrown rearwardly from the workpiece strike the stationary shield and are thrown downwardly through the said space, hinge means at the upward end of said support arms and a second shield member formed from a transparent material operatively associated with the hinge means and extending downwardly and forwardly therefrom.

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