H. N. MIDDLETON.

SAFETY TOOL APPLIANCE.

APPLICATION FILED SEPT. 22, 1915.

1,208,186. Patented Dec. 12, 1916.

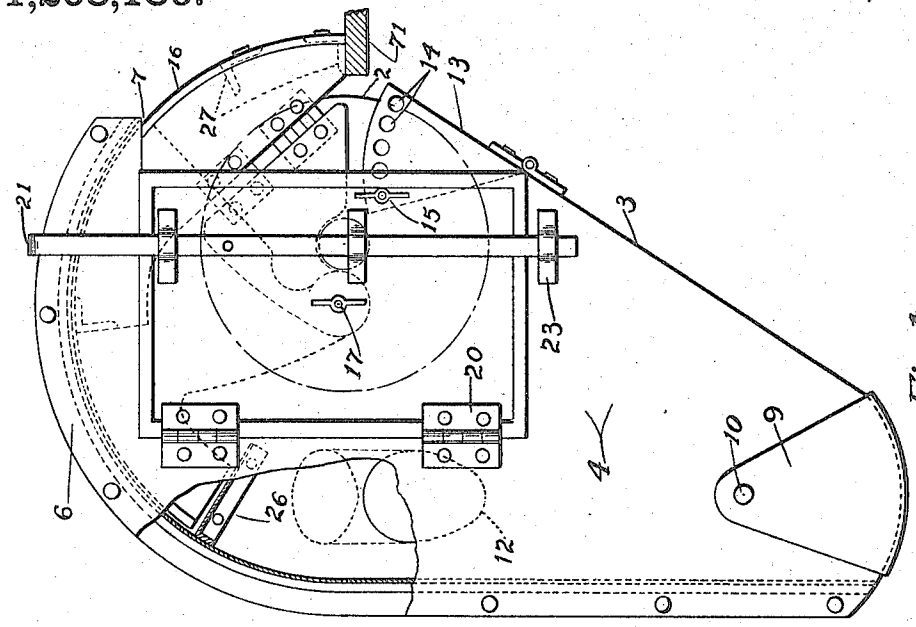


Fig. 1.

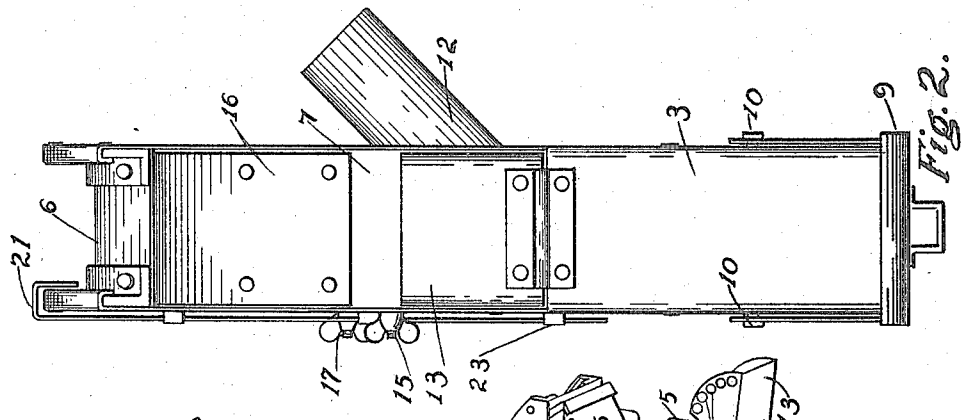


Fig. 2.

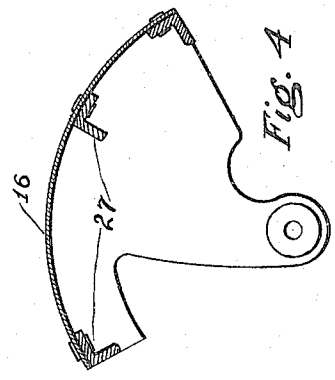


Fig. 4

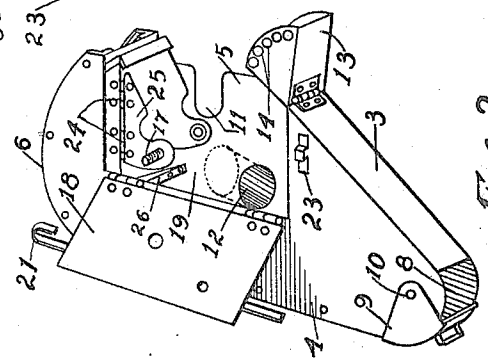


Fig. 3.

INVENTOR:
Harry N. Middleton
by his attorneys
Phillips, Van Everen & Fish

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARRY N. MIDDLETON, OF WESTVILLE, NEW JERSEY, ASSIGNOR TO B. F. STURTEVANT COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SAFETY TOOL APPLIANCE.

1,208,186. Specification of Letters Patent. Patented Dec. 12, 1916.

Application filed September 22, 1915. Serial No. 52,010.

To all whom it may concern:

Be it known that I, HARRY N. MIDDLETON, a citizen of the United States, residing at Westville, in the county of Gloucester and State of New Jersey, have invented certain new and useful Improvements in Safety Tool Appliances; and I do hereby declare the following to be a full, clear, and exact description of the invention such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to safety tool appliances and more particularly to a hood for rotary tools such as emery wheels and the like.

The present invention is designed to provide for the safety of operators, workmen and property in mills, tool shops and other places where high-speed rotary tools, such for instance as emery wheels and sand stones, are employed. Such tools are liable to, and do, burst from divers causes, such as too high speed, flaws of structure, abuse, or unavoidable accidents, and when they break the fragments are thrown off with much force owing to the great peripheral speed.

Therefore it is very desirable to have, and it is the object of this invention to provide, a hood for these wheels which will afford an effective guard against flying fragments from a rotative tool, will provide for free access to the rim of the wheel, and also will serve to collect the dust produced in grinding or polishing operations.

A further object of the invention is to provide a guard and hood which permit the ready mounting and dismounting of wheels, and which also provides for various requisite adjustments.

A prominent feature of the present invention comprises a hood having a guard member which will be automatically closed over or in front of the rotary tool or wheel when fragments or parts are thrown off from the wheel.

Further features of the invention consist of the means for mounting the guard member, and in the parts and connections conducive of accessibility and ease of mounting or dismounting the tool or wheel, or parts thereof.

To the accomplishment of the several objects referred to, and to such others as may hereinafter appear, as will be readily understood by those skilled in the art, the invention consists of the features, the construction, and the combination of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings which illustrate what is now considered to be the preferred embodiment of the present invention,—Figure 1 is a side elevation of the improved hood with the shutter closed and the casing partly broken away to show the fixed baffle. Fig. 2 is a front edge view of Fig. 1. Fig. 3 is a perspective of the hood, showing the side door open exposing the interior structure, the shutter raised, and the lower shield swung out. Fig. 4 is a section taken parallel to and between the sides of the shutter and showing the impact bars in cross-section.

The present invention is particularly adapted for use with emery wheels, though it is understood that a safety device of the present type may be practicably employed in combination with various rotary tools which are likely to be broken and from which pieces would be thrown off centrifugally to the danger of adjacent persons and property. The emery wheel is indicated at 2 as mounted on the end of a shaft. The hood is shown at 3, and comprises parallel sides 4, 5, which may be of suitable form and dimensions to afford proper space within the hood for inclosing the emery wheel or other tool to be covered. The walls 4, 5, are connected to form a wheel chamber by the body or shell portion 6 left open at the front to form a mouth 7 to provide access to the inclosed wheel 2. A tool rest 71 is located at the lower part of the mouth 7. The lower portion of the hood 3 tapers downwardly to form a pocket at the lower end which is provided with an aperture 8 over which there is movable a gate 9, curved to suit the lower curved end of the hood 3. The gate is adapted to swing about a pivot 10 disposed at the center of the curved lower portion of the hood to permit the removal of the heavier particles thrown off from the work on the wheel during the normal operation of the latter. There may be attached to the hood 3, for the purpose of

exhausting the lighter particles of dust produced during the grinding or cutting operation, an exhaust flue 12 which opens at its lower end intermediately between the top and bottom of the hood 3.

For facilitating the adjustment of the hood 3 upon a wheel and its mountings, the side 5 of the hood is shown as provided with a horizontal slot 11 of suitable depth, the inner end being curved to permit the close adjustment of the casing up against the bearing or shaft of the wheel. For the purpose of making adjustments in the size of the mouth of the casing relative as to the wheel 2 therein, there is pivoted on the front portion of the housing or hood 3 an adjustable lip or shield 13 with segmental sides provided with apertures 14 through which suitable fastening devices, as a thumb nut and screw 15, may be fastened to lock the shield 13 to the sides of the hood in the desired angular position in front of and in proximity to the wheel 2. The shield thus not only serves the purpose of preventing dust flying outwardly during the grinding operation, but also is utilized to decrease the opening at the front of the hood 3 so as to render more effective the dust exhaust by the suction blower which may be attached to the exhaust pipe 12.

One of the important features of the present invention consists of a means which will automatically operate to close the mouth 7 in the event of the bursting or fracturing of the rotating tool in the hood 3, and comprises a shutter 16 of substantially the form of a segment of a cylinder, which is pivoted at its axis upon bearings 17 in the sides of the casing or hood. The pivots 17 are disposed axially parallel and relatively close to and immediately behind the axis of the wheel 2, and the front edges of the sides of the shutter 16 are relieved or cut back so as to clear the shaft or wheel hubs when the shutter falls forward. The peripheral portion of the shutter is provided with impact shoulders 27.

To provide for the ready insertion and removal of a wheel when a change is desired, there is mounted on one side, as 4, of the hood 3, a door 18 which is adapted to close an opening 19 of ample size to permit the insertion or removal of the wheel in the casing. One of the pivots 17 of the sides of the shutter 16 is shown as projecting through the door 18, which forms a bearing for its adjacent side of the shutter 16. The door is mounted upon pivots 20 and is adapted to be thrown open to permit access to the wheel, or closed to cover the opening 19, in which position it overlaps the adjacent segmental side of the shield 13, these combining to inclose the wheel. The door 18 is provided with a slidable bolt 21 movable in suitable bearings on the outside of the door, and engages at its lower end in a fixed keeper 23 on the side 4 of the hood. The upper end of the bolt is adapted to hook over or stop against the top of the hood. The side of the segmental shutter 16 adjacent the door 18 is hinged at 24, so that its lower or inner portion 25 can be thrown outwardly to enable the insertion or removal of a wheel as to the casing 3. The pivot for the hinged portion 25 is removable, being in the form of a screw and wing nut, to permit the door 18 to be opened. Thus, in normal operation the shutter 16 stands upwardly above its pivots 17 and under the curved upper portion of the body 6 of the hood, and the mouth 7 is uncovered to provide access to the wheel. If now it is desired to remove the wheel, the wing nut is removed, the door 18 is unlocked and thrown outwardly about its hinges 20, the shield 13 thrown downwardly in front of the hood 3, and the hinged portion or leaf 25 swung upwardly, thus giving sufficient clearance to permit insertion or removal of the wheel 2.

If the lower gate 9 is closed, then during the rotation of the wheel and cutting operation the lighter dust particles will be exhausted through the pipe 12 from the hood 3, while the heavier particles will fall to the bottom of the hood and collect at the gate 9 whereby they may be readily removed as frequently as necessary.

In the normal operation the shutter 16 rests against an innermost stop 26 in the hood 3, preferably being so poised or balanced on its pivots 17 that it is then but slightly over-balanced and upon a very short forward movement will tend to close or fall of its own weight. When the wheel bursts the impact of the flying pieces against the impact shoulders 27 tends to swing the shutter 16 forwardly and downwardly, assisted by gravity, over the mouth 7 and against the tool rest 71 in proximity to the surface of the wheel. The closing of the shutter 16 is thus automatically controlled by the breaking of the wheel, and occurs so quickly that the escape of flying pieces through the mouth 7 is prevented.

The stop 26 is projected inwardly in the form of a plate or baffle to prevent the upward movement of pieces of the wheel when they break off at the rear of the wheel.

Having thus described the invention what is claimed is:

1. A hood for rotary abrasive wheels, comprising a cover portion with an aperture providing for access to the wheel face, and a part pivoted on said portion to cover or uncover the opening and adapted to be closed over the opening by the impact of fragments thrown off by the wheel, substantially as described.

2. A safety appliance for rotary abrasive wheels having, in combination, a protecting

covering with an opening to provide for access to the wheel rim, and a shutter adjustable to uncover the opening and adapted to be automatically closed over the opening by the impact of flying fragments from the wheel, substantially as described.

3. A hood for rotary abrasive wheels having, in combination, a curved upper portion and flanking sides and having a mouth for access to the wheel, a shutter for the mouth in the form of a segment of a cylinder pivoted at its axial line in the hood and standing normally in position within the hood to uncover the mouth thereof, the closing movement of the shutter being controlled by fragments from the rotating wheel, substantially as described.

4. A hood for polishing or grinding wheels having, in combination, a casing substantially inclosing the wheel and having an opening at the front for access to the wheel surface, and a guard member poised in said casing in slightly over-balanced position and tending to close the mouth by the action of gravity when moved slightly by fragments from the wheel, substantially as described.

5. A hood for polishing or grinding wheels having, in combination, a casing having a mouth at its front and an opening in its side for insertion or removal of the wheel, a closure for the side opening, and a shutter on the casing movable automatically over the mouth and controlled by the breaking of the wheel, substantially as described.

6. A hood for abrasive wheels having, in combination, a casing for substantially inclosing the wheel, adjustable means on the casing providing for the insertion or removal of the wheel, the casing having a mouth giving access to the tool, and a shutter the actuation of which is controlled by flying fragments breaking from the wheel, substantially as described.

7. A safety appliance for abrasive wheels or other rotary tools having, in combination, a hood for inclosing the wheel and having a door on one side for the insertion or removal of the wheel and open in front for access to the wheel face, and a shutter pivoted on the hood for adjustment normally to uncover the front opening and poised to readily move over the opening subject to the breaking of the wheel, the shutter having a hinged side to permit insertion or removal of the wheel, substantially as described.

8. A safety appliance for rotary tools, comprising a cover member with a rim portion approximating the circumference of the tool, said cover being adjustable to remain poised as to the tool and to provide access thereto and automatically movable to guarding position upon the breaking of the tool, substantially as described.

HARRY N. MIDDLETON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."