Oct. 6, 1931. J. W. PARKER 1,826,219

GRINDING WHEEL TRIMMING FIXTURE

Filed Dec. 14, 1929

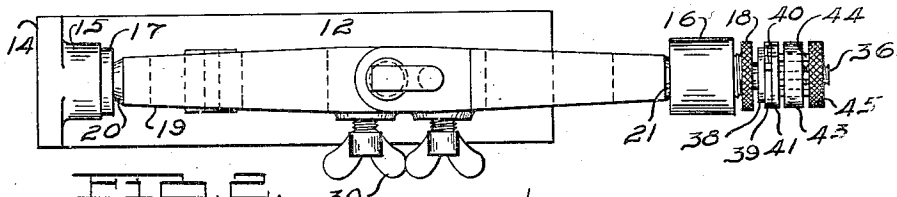


Fig. 2.

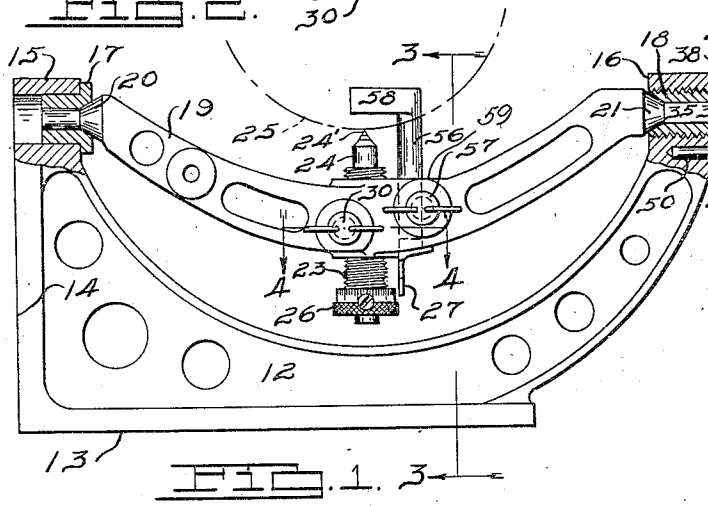


Fig. 1.

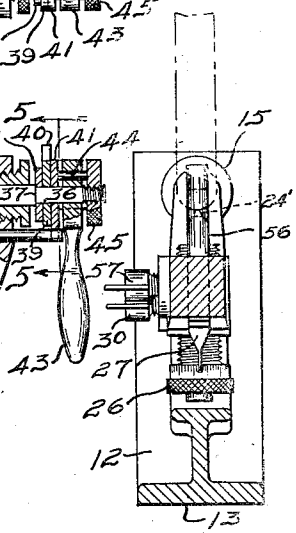


Fig. 3.

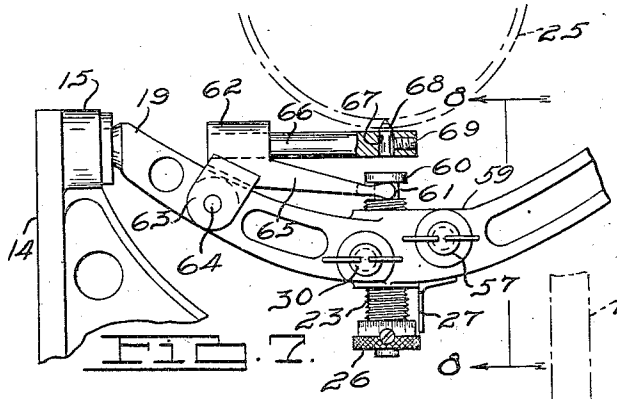


Fig. 7.

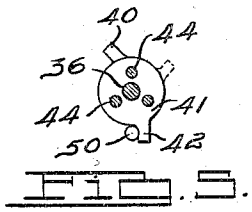


Fig. 5.

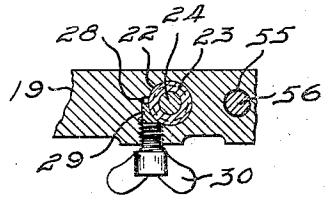


Fig. 4.

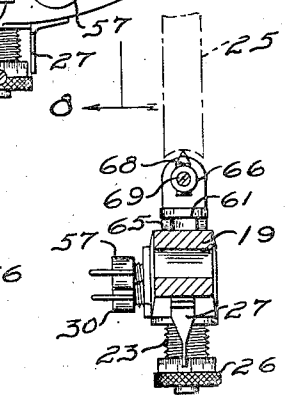


Fig. 8.

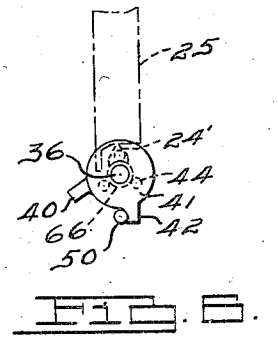


Fig. 6.

INVENTOR
John W. Parker.
BY
Harness, Dickey, Pierce & Hann,
ATTORNEYS.

Patented Oct. 6, 1931

1,826,219

# UNITED STATES PATENT OFFICE

JOHN W. PARKER, OF DETROIT, MICHIGAN

## GRINDING WHEEL TRIMMING FIXTURE

Application filed December 14, 1929. Serial No. 414,004.

This invention relates to means for trimming grinding wheels, the principal object being the provision of a simple and novel construction permitting a grinding wheel to be quickly and accurately trimmed to provide a radius of predetermined dimensions thereon.

Another object is to provide a portable grinding wheel trimming fixture for forming a radius on a grinding wheel and which fixture is readily adaptable for use in connection with almost any conventional type of grinding machine.

Another object is to provide a grinding wheel trimming device for forming radiuses on a grinding wheel, and which device is provided with means for quickly and accurately adjusting the same to form a radius of predetermined dimensions on a grinding wheel.

Other objects of the invention will be apparent from the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 is an elevational view of a trimming fixture embodying my invention.

Fig. 2 is a plan view of the fixture shown in Fig. 1.

Fig. 3 is a vertical cross sectional view of the fixture shown in Fig. 1, taken on the line 3—3, looking in the direction indicated.

Fig. 4 is a fragmentary cross sectional view of the fixture shown in Fig. 1, taken on the line 4—4, looking in the direction indicated.

Fig. 5 is a cross sectional view of the fixture shown in Fig. 1, taken on the line 5—5, looking in the direction indicated, showing the stop mechanism for controlling the angular movement of the trimming point.

Fig. 6 is a view similar to Fig. 5 illustrating the manner in which the angular stop may be employed.

Fig. 7 is a fragmentary elevational view of a modified form of trimming fixture embodying my invention.

Fig. 8 is a fragmentary cross sectional view of the fixture shown in Fig. 7 taken on the line 8—8 looking in the direction indicated.

I am aware that devices for trimming a grinding wheel to a predetermined radius are old in the art, but as far as I am aware, no device has heretofore been suggested which was portable or was capable of being employed on different types of grinding machines without considerable modification in their construction. It is, therefore, the principal object of the present invention to provide a trimming device which may be employed on different types of grinding machines for forming a radius on the grinding element thereof, and which may be quickly and readily adapted to various types of grinding machines and at the same time maintain all of the accuracy which is present in the built-in type of trimming devices now commonly employed.

Referring to the accompanying drawings, I show a trimming device including a frame 12. This frame 12 has two face plate surfaces 13 and 14 disposed at right angles to each other, each surface having a true plane surface and being of an appreciable width so that either may be employed as a locating surface for positioning the wheel trimming device. At opposite ends of the frame 12 are provided integral sleeves 15 and 16 in which bearing members 17 and 18 respectively are received. The bearing member 17 may be fixed as shown, but the bearing member 18 is preferably axially adjustable for reasons that will be hereinafter apparent. Rotatably received between the bearing members 17 and 18 is an auxiliary frame 19 having conical end bearing surfaces 20 and 21 received within the corresponding surfaces of the bearing members 17 and 18 respectively. Midway between the bearing surfaces 20 and 21 the auxiliary frame 19 is provided with a threaded opening 22 extending radially with respect to the pivotal axis of the auxiliary frame 19 and in which the hollow screw element 23 is adjustably threaded. Within the screw element 23 is removably received the trimming member 24 which is provided with the usual diamond point 24′ employed for dressing a grinding wheel such as 25. The opposite end of the screw element 23 is preferably provided thereon with a rotatably adjustable micrometer head 26, and a co-operating indicating finger 27 is preferably provided upon the sub-frame 19 in co-operative relationship therewith.

As indicated best in Fig. 4, an opening 28

is provided in the sub-frame 19 with its axis extending perpendicularly with respect to the axis of the opening 22 and in intersecting relationship with respect to the opening 22. A clamping block 29 is received within the opening 28 and a wing nut 30 is provided for forcing the clamping block 29 into clamping relationship with respect to the screw member 23 so as to enable the same to be locked in adjusted position.

The right hand end of the sub-frame 19, as viewed in Fig. 1, is extended through the bearing member 18 as at 35. This portion 35 is reduced as at 36 so as to form a shoulder 37. The washer member 38 is received over the portion 36 in abutting relationship with respect to the shoulder 37 and is preferably maintained against rotation relative to the portion 36. A second washer-like member 39 is rotatably received on the end 36 and in contact with the washer 38. This member 39 is provided with an extended finger 40. A third washer-like member 41 having an extended finger portion 42 similar to the finger 40, is received on the extended end 36 and in contact with the member 39. The member 41 is followed by a handle member 43 which is rotatably received on the end 36 and the hub portion of which is provided with three axially slidable pins 44 which are of greater length than the thickness of the hub of the handle 43. Following the handle 43 a nut member 45 is threaded on the outer end of the portion 36. By suitably threading up the nut 45 the pins 44 and the members 41 and 39 are caused to be clamped against relative rotation to the shaft 36 between the nut 35 and the washer 38. In this manner the handle 43 may be clamped against relative rotation to the portion 36, and consequently the sub-frame 19, so that on turning the handle 43 the sub-frame 19 and consequently the diamond point 24′ may be caused to move about the pivotal axis of the sub-frame 19.

As indicated best in Fig. 1, a pin 50 is fixed in the right hand end of the main frame 12, adjacent the sleeve 16 and in parallel relationship with respect to the pivotal axis of the sub-frame 19. This pin 50 projects out to the right into the path of movement of the fingers 40 and 42 on the members 39 and 41, respectively. As indicated best in Figs. 5 and 6, the fingers 40 and 42 in contacting with the pin 50 limit the amount of angular movement which may be imparted to the sub-frame 19 and consequently the diamond point 24′ by rotation of the handle 43. The purpose of limiting this angular movement of the trimming point will be obvious to those skilled in the art. It will also be obvious that by releasing the pressure of the nut 45 either one or both of the members 39 and 41 may be rotated relative to the part 36 and then be clamped in adjusted position by tightening up the nut 45 so that the permissible amount of angular movement of the trimming point 24′ may be quickly and accurately adjusted.

In employing this device for trimming a grinding wheel, either the face 13 or 14 is clamped by any suitable means to the table or any other suitable face of the grinding machine upon which the device is to be used, with the pivotal line of the sub-frame 19 in suitable relation to the plane of the grinding wheel 25. Where the face of the machine to which the device is secured is adjustable relative to the grinding wheel, or where the grinding wheel 25 is adjustable relative to such face, suitable adjusting movement of these parts may be caused to bring the point 24′ into operative relationship with respect to the grinding wheel 25, and the handle 43 may then be turned to cause the point 24′ to trim the required radius on the wheel 25, it being understood that the particular radius required may be obtained by axial adjustment of the member 23.

Where a predetermined radius is required to be trimmed upon the grinding wheel 25, I provide the following spanner caliper mechanism for setting the point 24′ to produce such radius. To one side of the opening 22 in the frame 19 and in parallel relationship therewith I provide a second opening 55. In the opening 55 a bar member 56 is slidably received for axial movement. Means are provided for locking the bar 56 in axially adjustable position comprising a wing nut 57 and a clamping block (not shown) similar to the clamping block 29 previously described. The upper end of the bar member 56 is provided with a transversely projecting head 58 which extends over the diamond point 24′ and surface 59. Bar 56 and head 58 forms a spanner caliper arm, the surface 59 being the other arm.

The auxiliary frame 19 has a reference or datum surface 59 upon its upper portion. This surface 59 is a true-plane face plate disposed parallel to the face plate 13, perpendicular to face plate 14 and parallel to the pivotal axis passing through 20 and 21 and perpendicular to a plane including said axis and bisecting said auxiliary frame. In operation, when it is desired to trim a grinding wheel to a predetermined radius the member 23 is unthreaded until the cutter 24′ is completely below surface 59. A gage block (not shown) equal in thickness to the distance between the axis and plane 59 is placed on plane 59. The bar member 56 is inserted in opening 55 and the head 58 is swung over the block, (and also over the diamond point 24′). The head is then moved flush with the block and held in position by wing nut 57. The block is removed. The lower surface of the head 58 is now on the pivotal axis of frame 19.

The point 24′ may now be set in several manners. One manner is to screw the point

into contact with the lower surface of head 58, set the micrometer scale 26 at 0 and then back off screw the desired distance equal to the resultant radius. Another manner is to use another block (not shown) of the same thickness as the required radius to be trimmed on the grinding wheel 25 which is then placed against the under face of the head 58 immediately over the diamond point 24′ and the member 23 is moved axially until the point just comes in contact with such block, and the member 23 is then locked in such position. It will be obvious that the diamond point is then at the required radius or distance from the center of pivot of the auxiliary frame 19, and that when the point 24′ is swung in contact with the grinding wheel 25 when in such position it will produce thereon a radius of the required dimension.

The above described mechanism is provided where the grinding wheel is to be provided with a convex radiused surface. Where a concave radius surface is to be provided on the grinding wheel a modification of the above construction is desirable in order to permit the desired angular extent of radius to be obtained. In such a case a construction such as is illustrated in Figs. 7 and 8 may be employed. As illustrated in these figures, the diamond point 24′ may be removed from the screw member 23 and replaced by a member 60 providing a circumferential groove 61. A bell crank member 62 having a pair of spaced flanges 63 adapted to fit over the auxiliary frame 19 may be pivotally secured to the auxiliary frame 19 as by means of a pin 64 passing through the flanges 63 and the sub-frame 19. The member 62 is provided with an extended arm 65 provided with a yoked end closely but slidably received in the groove 61. It is also provided with an extended bar member 66 whose axis is initially positioned in approximately parallel relationship with respect to the axis of rotation of the auxiliary frame 19 and the free end of which, immediately above the screw member 23, is provided with an opening 67 in which the diamond holder 68 is received and locked by means of the set screw 69. It will be apparent that with this construction movement may be imparted to the diamond holder 68 either towards or away from the pivotal axis of the sub-frame 19 by suitable movement of the member 23 transmitted through the bar 66 and arm 65 of the member 62. It will also be apparent that by reason of this construction a concave surface having a smaller radius of curvature may be provided than in the construction first described. It will also be apparent that the bar member 56 may be employed for setting the diamond point 68 to accurately produce a concave surface of predetermined dimensions, but in the use of the bar member 56 for this purpose the head 58, instead of being initially positioned on the pivotal axis of the sub-frame 19, will be positioned above it a predetermined amount greater than the radius of the surface which the diamond point is to trim, either an amount equal to such radius or else an amount greater than such radius by the thickness of a block employed for setting the point.

These and other formal changes may be made in the specific embodiment of the invention described without departing from the spirit or substance of the broad invention, the scope of which is commensurate with the appended claims.

I claim:

1. In a device of the type described, in combination, a main frame, an auxiliary frame swiveled thereon, a grinding wheel trimming tool carried by said auxiliary frame, a pair of stop members rotatably mounted on said auxiliary frame, a single means for locking said stop members in any one of a plurality of rotatably adjustable positions against rotation relative to said auxiliary frame, and a stop member on said main frame in co-operative relationship with respect to said stop members.

2. In a device of the type described, in combination, a main frame, an auxiliary frame swiveled thereon, a grinding wheel trimming tool carried by said auxiliary frame, an axial extension on said auxiliary frame, a pair of stop members rotatably mounted on said extension, a handle rotatably mounted on said extension, a single means for locking said handle and said stop members in rotatably adjusted position against relative rotation to said extension, and a stop member fixed to said main frame for co-operation with said stop members.

3. In a device of the type described, in combination, a main frame, an auxiliary frame swiveled thereon, a grinding wheel trimming tool carried by said auxiliary frame, an axial extension on said auxiliary frame provided with a shoulder, a pair of stop members rotatably mounted on said extension, a handle on said extension, means co-operating with said handle and said stop members for clamping said stop members against relative rotation to said shoulder, and a stop member fixed to said main frame in co-operating relation with respect to said stop members.

4. In a device of the type described, in combination, a main frame, an auxiliary frame swiveled thereon, a grinding wheel trimming tool carried by said auxiliary frame, an axial extension on said auxiliary frame provided with a shoulder, a pair of stop members rotatably mounted on said extension, a handle on said extension, means co-operating with said handle and said stop members for clamping said stop members against relative rotation to said shoulder, and

a stop member fixed to said main frame in co-operating relation with respect to said stop members comprising a pin slidably carried by said handle for movement parallel to the pivotal axis of said auxiliary frame, and a nut threaded on said extension and bearing against said pin whereby to force it against one of said pair of stop members, and thereby force said stop members towards said shoulder.

5. A grinding wheel trimmer having in combination a main frame, an auxiliary frame axially pivoted in the main frame, a cutter movably mounted on said auxiliary frame, a datum surface on said auxiliary frame, and a spanner caliper arm slidably mounted on said auxiliary frame, means to clamp said spanner caliper arm a predetermined distance from said datum surface, and means to set said cutter a predetermined distance from said auxiliary frame, said first mentioned means comprising gage blocks.

JOHN W. PARKER.