W. A. & F. W. MARSCHKE.

GRINDER.

APPLICATION FILED SEPT. 20, 1915.

1,177,199.

Patented Mar. 28, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

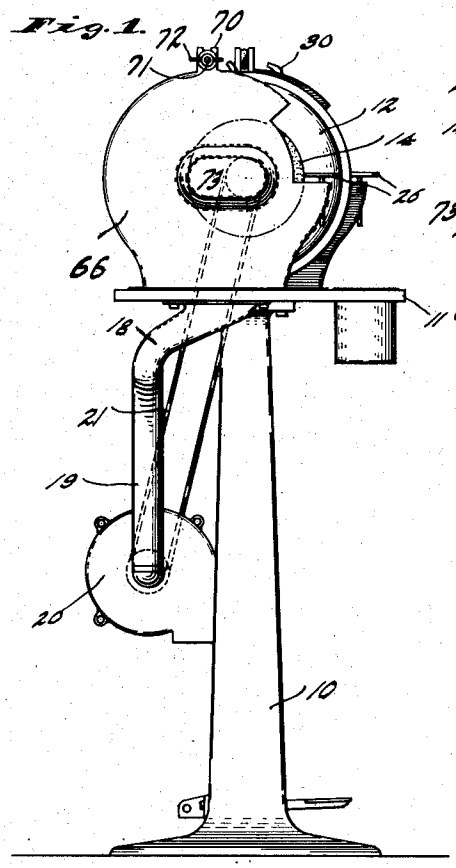


Fig. 2.

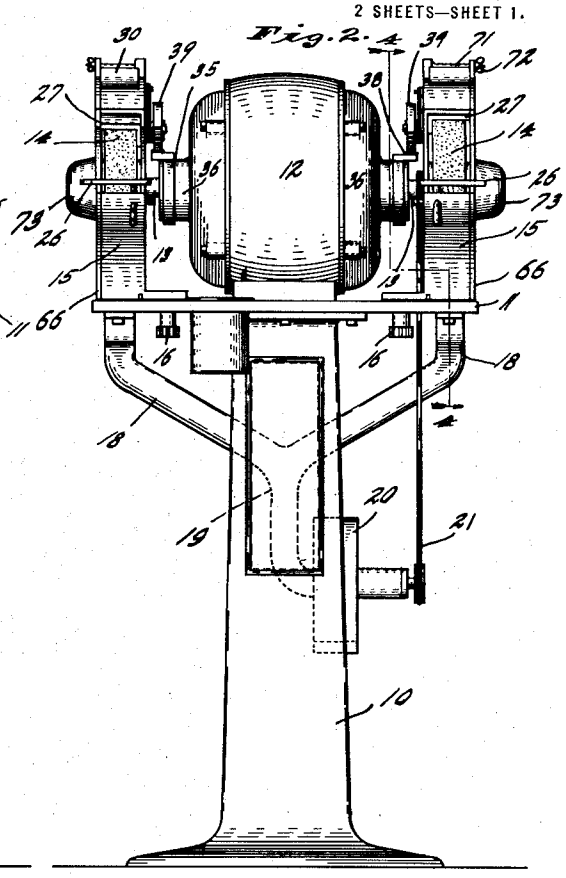
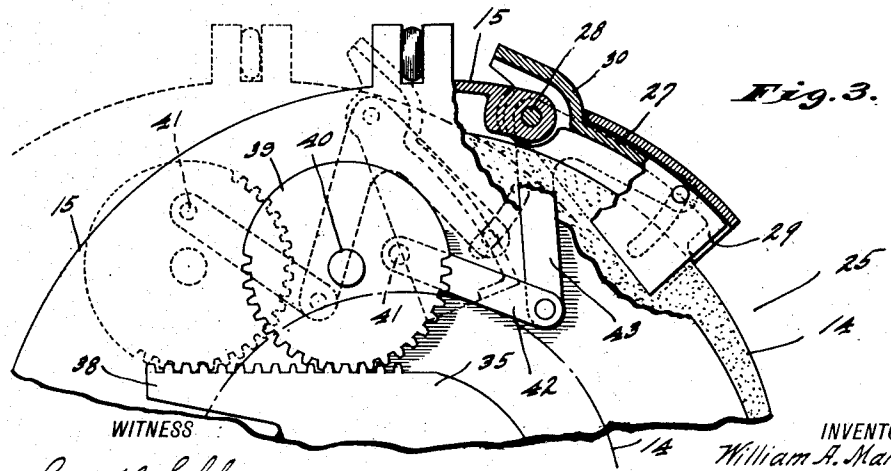


Fig. 3.



WITNESS

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2 SHEETS—SHEET 2.

Fig. 4.

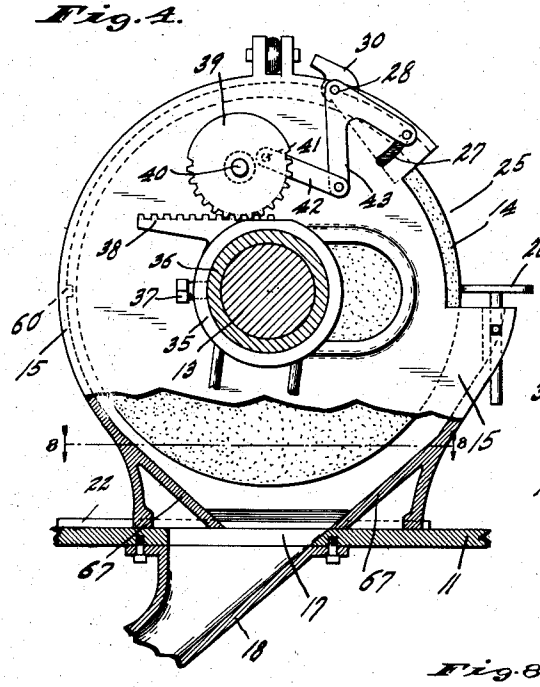


Fig. 5.

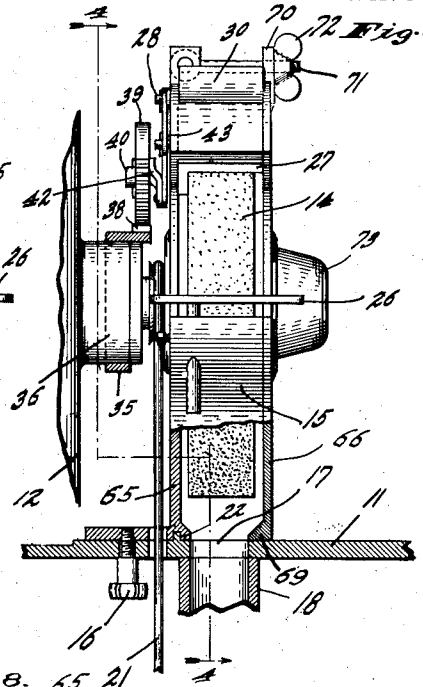


Fig. 8.

Fig. 6.

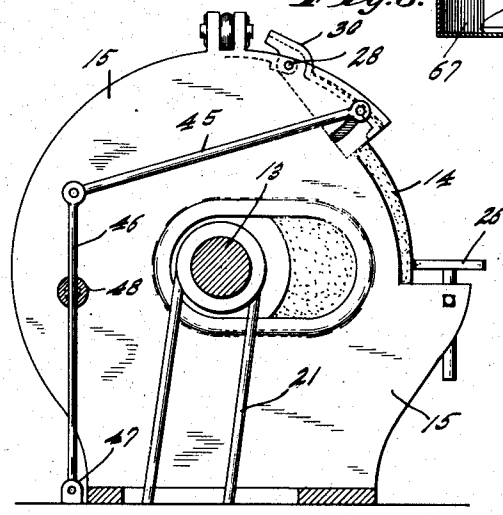


Fig. 7.

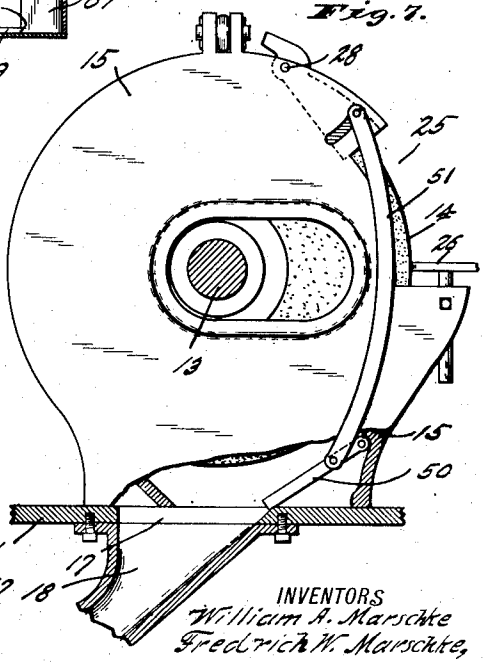
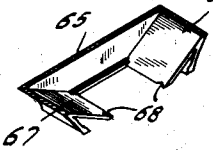


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM A. MARSCHKE AND FREDRICH W. MARSCHKE, OF INDIANAPOLIS, INDIANA, ASSIGNORS TO STANDARD MACHINE AND ELECTRIC CO., OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

GRINDER.

1,177,199. Specification of Letters Patent. Patented Mar. 28, 1916.

Application filed September 20, 1915. Serial No. 51,720.

To all whom it may concern:

Be it known that we, WILLIAM A. MARSCHKE and FREDRICH W. MARSCHKE, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Grinder, of which the following is a specification.

It is the object of our invention to minimize the sparks which cling to and are thrown out from the surface of an abrasive grinding wheel.

In carrying out our invention, we provide an inclosing casing for the abrasive grinding wheel, and maintain a continuous suction from this casing so that sparks which are produced by the grinding are largely or wholly drawn out by such suction instead of being thrown out through the opening at which the grinding wheel is exposed for the application of the articles being ground; and we mount this casing slidably, so that as the grinding wheel is worn away the casing can be slid to maintain the opening into the casing for the application of the articles to be ground as close to the grinding wheel as desired; and we mount in such casing at the upper end of the aforesaid opening a deflector plate which is swung inward as the casing is moved to compensate for the wearing of the grinding wheel, so that the deflector plate always remains close to the surface of the grinding wheel; and we provide an air passage on the opposite side of such deflector plate from such opening, for producing a current of air for cooling any sparks which are carried around by the grinding wheel; and we preferably provide a structure in which a single motor drives two grinding wheels each of which is provided with a casing separately adjustable as above described, with both casings provided with a single suction-producing means.

The accompanying drawings illustrate our invention.

Figure 1 is a side elevation of a grinding device embodying our invention, there being two grinding wheels driven by a single motor; Fig. 2 is a front elevation of such grinding device; Fig. 3 is an enlarged side elevation, in partial section, of the upper portion of one of the grinding wheels and its casing, showing mechanism for adjusting the deflector plate as the casing is slid; Fig. 4 is a section on the lines 4—4 of Figs. 2 and 5; Fig. 5 is a front elevation of the parts shown in Fig. 4, with the lower part in section; Figs. 6 and 7 are side elevations of grinders embodying a modified form of the mechanism for working the deflector plate; Fig. 8 is a reduced section on the line 8—8 of Fig. 4; and Fig. 9 is a perspective view of the main part of the casing, with the upper part cut away.

The grinding device consists of a pedestal 10 supporting a table 11 on which is mounted a motor 12, which is preferably an electric motor, which has a shaft 13 projecting at both ends and having mounted on each projecting end an abrasive grinding wheel 14. Each grinding wheel 14 is located within a casing 15, which rests upon the table 11 and is mounted to slide forwardly and rearwardly on such table, being clamped in any desired position by a clamping screw 16 and guided in its movements by a slide 22. Each casing 15 is open at the bottom and communicates through an opening 17 in the table 11 with a pipe 18. The two pipes 18 are the upper ends of a Y-shaped pipe the stem 19 of which leads to the inlet of a centrifugal fan 20, driven by a belt 21 from a shaft 13, so that the fan 20 maintains a suction in both casings 15. Each casing 15 is cut away at the front to provide an opening 25, for the application of articles to be ground to the grinding wheel 14. At the bottom of this opening 25 is the usual tool rest 26, which is adjustably supported in the casing 15. At the top of the opening 25, but under the casing 15, is a deflector plate 27, which is pivotally mounted at its upper end on a pivot pin 28 in the casing 15 and at its lower end is provided with an inwardly projecting flange 29 which just clears the periphery of the grinding wheel 14. The deflector plate 27 is provided with an outwardly flared portion 30 around the pivot pin 28 for providing an air passage between the outside air and the periphery of the grinding wheel 14 above the flange 29.

As the grinding wheel 14 is used, and wears away, the casing 15 is slid rearward, to expose the desired portion of the grinding wheel through the opening 25. This rearward sliding of the casing 15 causes the deflector plate 27 to swing about its pivot pin

28 so that the inner edge of the flange 29 is always maintained close to the periphery of the grinding wheel 14. This may be accomplished in various ways. In the arrangement shown in Figs. 1 to 5 inclusive, a ring 35 is clamped on the adjacent bearing 36 of the motor 12, as by a clamping screw 37, and this ring 35 is provided with a horizontal rack 38. A pinion 39 is mounted on a pivot pin 40 on the casing 15, so that it meshes with the rack 38. A crank pin 41 on the pinion 39 is connected by a link 42 to a downwardly projecting arm 43 from the deflector plate 27. Thus as the casing 15 is slid rearward, the pinion 39 rolls on the rack 38, and the rotary movement of the crank pin 41 causes the deflector plate 27 to be swung downwardly so that the inner edge of the flange 29 is maintained in close proximity to the periphery of the grinding wheel 14.

In the modification shown in Fig. 6, the deflector plate 27 is connected by a link 45 to the upper end of a lever 46, the lower end of which is pivoted on a fixed support 47, and an intermediate point of which extends loosely through a transverse opening in a pivot pin 48 mounted on the casing 15. As the casing is moved rearward, the upper end of the lever 46 is moved more rapidly than the casing and the link 45 thus tilts the deflector plate 27 to draw the flange 29 close to the periphery of the grinding wheel 14.

In the modification shown in Fig. 7, an arm 50 is pivoted within and near the bottom of the casing 15, near the front thereof, and rests upon the forward edge of the opening 17 in the table 11. This plate is connected by a link 51 to the deflector plate 27. As the casing 15 is slid rearward, the arm 50 slides downward into the opening 17, and by its weight, transmitted through the link 51, tilts the deflector plate 27 toward the edge of the flange 29 toward the periphery of the grinding wheel 14.

In operation, the motor 12 drives the grinding wheels 14 and the fan 20. The fan 20 sucks air into the casings 15 through the openings 25, and out of such casings through the openings 17 and the pipes 18 and 19. The casings 15 are adjusted so that the flanges 29 are close to the peripheral surfaces of the grinding wheels 14. As the articles are placed against the grinding wheels to be ground, and sparks are produced, the greater amount of the sparks are drawn out of the casings 15 by the action of the fan 20. If any sparks, however, are carried around by either wheel 14, such sparks are in large part removed by the flange 29 of the deflector plate 27, and are cooled by the current of air passing through the opening provided by the flared portion 30. As either grinding wheel 14 is worn away, its casing 15 is slid rearward, and the flange 29 is brought closer to the peripheral surface of such wheel by such sliding. Fig. 3 shows in full and dotted lines respectively the relative positions of the casing and the deflector plate for the full-sized grinding wheel, shown in full lines, and for a very much reduced grinding wheel, shown in chain lines.

If desired, the inner surface of the casing 15 may be provided with one or more inwardly projecting flanges 60, which project toward the peripheral surface of the grinding wheel 14 and act to catch and deflect some of the sparks which may be carried around past the opening 17. One of such flanges 60 is shown in dotted lines in Fig. 4.

The casing 15 has the main portion 65, which is on the side toward the motor 12 and extends around the periphery of the grinding wheel 14, and a removable side 66 which is on that side of the grinding wheel 14 away from the motor 12. The deflecting plates 67 which guide the air into the opening 17 are on the main portion 65. Near their edges toward the removable side 66 these deflecting plates are provided with notches 68, which receive a dove-tailed projection 69 on the inner face of the removable side 66. This holds the lower part of the side 66 in place. The upper part of said side 66 is provided with two spaced fingers 70, between which a pivoted bolt 71 may be swung, so that a winged nut 72 on such bolt may coöperate with the fingers 70 to hold the upper part of said side 66 against the main part 65 of the casing 15. The removable side 66 is provided with an outwardly projecting cup portion 73 for fitting over the projecting portion of the motor shaft beyond the abrasive wheel 14. This cup-shaped portion is indicated horizontally, to permit the sliding of the ca[illegible]. By removing the side 66, the abrasive [illegible]heel 14 is exposed, as for removal or repl[illegible]ement.

We claim as our invention:

1. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide in the [illegible]lane of the grinding wheel to compensat[illegible]or the wear of the grinding wheel, a deflector plate mounted in said casing and projecting into proximity to the periphery of the grinding wheel, and operating means for the deflector plate for swinging it inward as the casing is slid to compensate for the wear on the grinding wheel.

2. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide as a unit in the plane of the grinding wheel to compensate for the wear of the grinding wheel, and a deflector plate adjustably mounted in said casing and projecting

into proximity to the periphery of the grinding wheel, said deflector plate being adjustable relatively to the casing toward and from the periphery of the grinding wheel.

3. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide in the plane of the grinding wheel to compensate for the wear of the grinding wheel, a deflector plate adjustably mounted in said casing and projecting into proximity to the periphery of the grinding wheel, and operating means for the deflector plate for swinging it inward as the casing is slid to compensate for the wear on the grinding wheel, said casing providing an opening for the passage of a current of air on the other side of said deflector plate from said first-named opening.

4. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide in the plane of the grinding wheel to compensate for the wear of the grinding wheel, and a deflector plate adjustably mounted in said casing and projecting into proximity to the periphery of the grinding wheel, said casing providing an opening for the passage of a current of air on the other side of said deflector plate from said first-named opening.

5. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide in the plane of the grinding wheel to compensate for the wear of the grinding wheel, a deflector plate mounted in said casing and projecting into proximity to the periphery of the grinding wheel, said casing providing an opening for the passage of a current of air on the other side of said deflector plate from said first-named opening.

6. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide in the plane of the grinding wheel to compensate for the wear of the grinding wheel, said casing being open at the bottom, a plate on which said casing is supported for its sliding movement, said plate having an opening through it which registers with the opening in the bottom of the casing for all positions of the casing, and a suction device connected to the opening in the plate.

7. In combination, a rotatably mounted grinding wheel, a casing therefor, said casing having an opening for admitting articles to be ground and being slidably mounted to slide in the plane of the grinding wheel to compensate for the wear of the grinding wheel, a deflector plate pivotally mounted in said casing at one side of said opening and having at its free end a flange projecting into proximity to the periphery of the grinding wheel, and means operated by the sliding of the casing for adjusting said deflector plate so that the inner edge of said flange always lies close to said periphery.

In witness whereof, we have hereunto set our hands at Indianapolis, Indiana, this 18th day of September, A. D. one thousand nine hundred and fifteen.

WILLIAM A. MARSCHKE.
FREDRICH W. MARSCHKE.

Witnesses:
HAROLD W. MARSCHKE,
ELIZABETH H. MEIER.