This invention relates to improvements in dressing devices for abrasive wheels by which the peripheries of the wheels are brought to a predetermined form.

It has long been known to cut away or dress the peripheries of abrasive wheels to desired shapes for therewith grinding articles to given contours. It has further been proposed to mechanically support the tool employed for such dressing and to guide it along a given path by mechanical means.

The present invention proposes certain simplifications in such apparatus, and presents a structure which enables the dressing of wheels rapidly and accurately to any desired profile, and to given diameters.

Another object of the invention is to so construct the parts that the desired profile may be given to a simple cam, which thereafter may be employed repeatedly in the machine to produce abrasive wheels of the desired form.

A further object of the invention is to provide a structure which may be employed to dress the surfaces of a number of wheels at a single chucking.

Further objects are to provide lubricating and scavenging devices for assisting the operation of the dressing tool; to provide means for readily and easily calibrating the device to dress wheels to a given diameter; to provide means for quickly and easily removing the tool and its associated parts from the vicinity of the wheel; to provide a resilient structure to maintain the tool in its cutting position while operating; and others as will appear in the course of the following specification and claims.

In the drawings:

Fig. 1 is a plan view of the device in operative relation with two abrasive wheels.

Fig. 2 is a plan view of the tool carriage and slide, with the cover removed.

Fig. 3 is an end elevation of the device as in Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 2.

The machine frame 10 has bearings 11 to receive the mandrel 12 which carries, in splined relation thereon, the collars 13 which support and space the abrasive wheels A, A', here two in number although obviously one or any number may be employed. The frame 10 also carries bearings 14 supporting the horizontal rock shaft 15 which has key vee thereto the rock arms 16.

The tool slide includes a base plate 17 having side plates 20 at the ends. Cap screws 18 with heads 19 pass through the plates 20 and are threaded into the base plate 17. It is preferred to pass these cap screws 18 through the free ends of the rock arms 16, so that when the screws are drawn tight, the base plate 17 is located in invariable relation to the arms 16; which relation usually will be to bring the base plate 17 and its tool into a radial position with regard to the mandrel 12. The side plates 20 extend upwardly to present a firm support for the cover 21 which is fastened to them by the screws 22 (Fig. 1). The cap screws 20 hold the plates 20 rigid with respect to the base plate 17.

A tool carriage 23 may move along the slide between the base plate 17 and cover 21, and is guided for rectilinear movement by the ribs 24 which engage in corresponding grooves of the plate 17 (Fig. 4). A feed screw 25 is journaled in the wells 26 and has its larger threaded central portion engaged in the carriage 23, so that by rotation of the screw 25, the carriage is caused to move along the base plate 17 in a direction parallel to the mandrel 12. One end 26 of the screw projects to a point clear of the adjacent nut 19, and has at its end a hand wheel or crank 27 so that it may be rotated manually in the illustrated form.

A tool carrier 28 is received for sliding movement to and from the wheels in the carriage, and has its front or wheel end enlarged and constructed as a tool holder to receive the spindle 29 which supports the tool 30 proper, which may be the usual diamond or other dressing instrument. A set screw 31 holds the spindle immovable with regard to the holder. Beneath the rear end of the tool carrier is fastened a lug 32 which has a pointed forward end (Fig. 2).

The cam 33 has its rear edge formed to the shape predetermined to produce the de-
sired contour on the abrasive wheel. In the illustrated form, since there are two abrasive wheels A, A’, designed to have a central ridge with conical slopes therefrom, two projections 34 are formed with central points and straight sides. These points are naturally spaced apart a distance equal to the distance of the ridges on the two abrasive wheels A, A’. This cam is secured to the rear of the base plate 17 by the screws 35: it will be understood that such cams are prepared according to the particular contours to be given to the abrasive wheel or wheels, and that it is only necessary to exchange one cam for another to change the machine for dressing wheels to different contours, other conditions being alike.

One bearing 11 is formed with a projecting bifurcated lug 36 which receives a threaded adjusting link 37, which at one end has an eye 38 received loosely for pivotal movement on a spacing collar 39 located on one stud 18. The adjusting nuts 40 on the link 37 permit an exact adjustment of the distance between the centers of mandrel 19 and the studs 18, which may be slightly loosened, and the link 37 swung out of the lug 36, whereupon the entire device may be rocked about the axis of shaft 15, and withdrawn from the abrasive wheels.

In order to force the tool 30 towards the wheels, a leaf spring 41 has its rebent end 42 held rigidly upon the upper surface of the tool carriage 23 by the set screw 43 and clamping collar 44. This leaf spring 41 is bent into a U-shape, and at its free end 49 presses against the rear end of the tool carrier 28 to force it forwardly toward the abrasive wheels. A threaded spindle 45 is attached to the carriage 23, preferably by being formed integrally with the collar 44, and extends rearwardly and through an opening in the spring 41. A nut 46 and washer 47 are engaged on this spindle, and compress a coil spring 48 which surrounds the latter, with regard to the leaf spring 41, as shown in Fig. 4, to afford a quick snubber or dampener against harmonic vibrations of the leaf spring which may cause scoring of the wheels.

The spring 41, resiliently forces the point 32 toward engagement with the cam 33, no matter what the contour may be. Depending upon the dressing to be done, the tool cuts its way into the abrasive wheel until the point 32 comes into contact with the cam—usually merely a truing is to be accomplished, for which only a slight amount of material need be removed.

In order to keep the tool 32 clear, a lubricating or scavenging material, such as oil or a solution is delivered from a suitable elevated tank or pump (not shown) to the flexible hose 50, and thence to the pipe 51 which passes through and is secured to the carriage 23. The front end of pipe 51 is bent over and reduced to form a nozzle 52 which directs the material upon the tool 30. The pipe 51 and the nozzle follow the tool in its movements and assure a uniform flow of material to the dressing tool.

It is obvious that many modifications may be made in the parts and their arrangement without departing from the scope of the appended claims.

What I claim as new is:
1. A dressing device for abrasive wheels comprising a rotatable mandrel to receive the wheels, a base plate, means to hold said base plate rigid at a predetermined distance from said mandrel, a tool holder and a tool therein movable along said plate parallel to said mandrel, a leaf spring to move said holder toward said mandrel, a coil spring to assist said leaf spring, and a rod to guide said leaf spring and forming a support for said coil spring.
2. A dressing device for abrasive wheels comprising a frame, a mandrel journaled on said frame and receiving the wheels to be dressed, a rock shaft journaled on said frame, rock arms splined to said shaft, a base plate carried by said arms and movable therewith toward and from said mandrel, a carriage guided on said plate for movement parallel to said mandrel, a tool holder and a tool therein slidable in a plane at right angles to said mandrel, a feed screw journaled on said plate to move said carriage along said plate, a leaf spring fastened to said carriage and pressing said holder and tool toward said mandrel, a guide rod on said carriage to guide the free end of said leaf spring, a coil spring on said guide rod to assist said leaf spring, and a cam on said plate to limit the movement of said holder.
3. A dressing device for abrasive wheels comprising a frame having a journal bearing, a mandrel in said bearing to receive the wheels, rock arms journaled on said frame upon an axis parallel to said mandrel and at a fixed distance therefrom, a base plate, a collar, cap screws passing through said rock arms and collar and threaded into said base plate to hold the same in fixed relation thereto, a link pivoted on said collar and attached to said frame to maintain said base plate in spaced relation to said mandrel, and a tool holder and a tool therein movable along said base plate parallel to said mandrel.
4. A dressing device for abrasive wheels comprising a frame having a journal bearing, a mandrel in said bearing to receive the wheels, rock arms journaled on said frame upon an axis parallel to said mandrel and at a fixed distance therefrom, a base plate, side plates at the ends of said base plate, a collar, cap screws passing through said side plates, rock arms and collar and
threaded into said base plate to hold the same in fixed relation thereto, a link pivoted on said collar and attached to said frame to maintain said base plate in spaced relation to said mandrel, a tool holder and a tool therein movable along said base plate parallel to said mandrel, and a feed screw jour-"ned in said side plates to move said tool holder and tool.

5. A dressing device for abrasive wheels comprising a rotatable mandrel to receive the abrasive wheel, a base plate movable to and from said mandrel, means to maintain said plate at a predetermined distance from said mandrel, a tool carriage mounted on said plate, means to cause said carriage to travel along said plate parallel to said man-"drel, a cam on said plate shaped in correspondence with the peripheral contour to be given said wheel, a tool holder slidable on said carriage to and from the mandrel and a tool therein, means on said tool holder to engage said cam and cooperate therewith so that a movement of said tool toward the axis of said mandrel is limited thereby, a spring blade carried by said carriage and rebent for resiliency and to engage said tool holder to move the said tool toward the axis of said mandrel, a spindle attached to the carriage and passing through an aperture in said spring blade, and a coil spring on said spindle and maintained thereby for engagement with said spring blade to cooperate therewith in maintaining said tool in the operating position.

In testimony whereof, I affix my signature.

JOSEPH MAICKEL.