Aug. 19, 1930. H. WITZLEBEN 1,773,564

KNIFE GRINDER

Filed May 21, 1928

Fig. 1

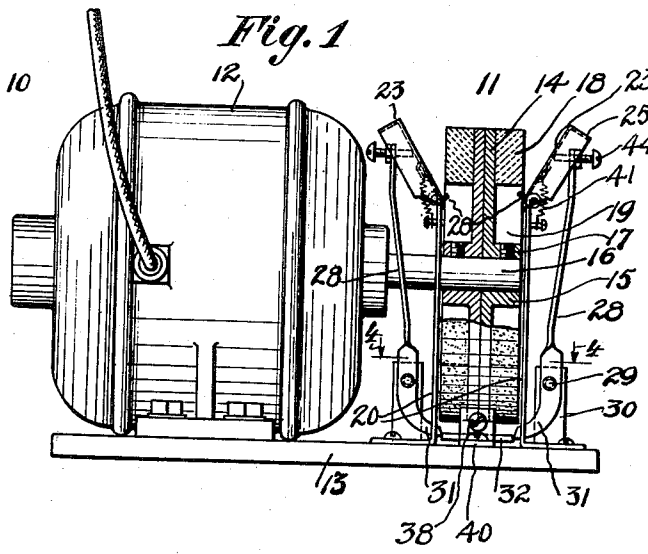


Fig. 4

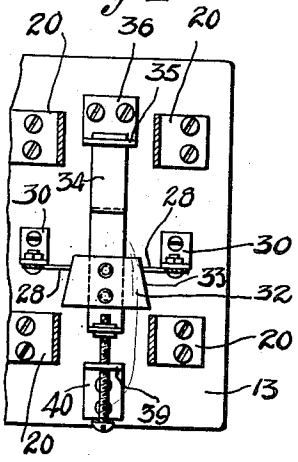


Fig. 2

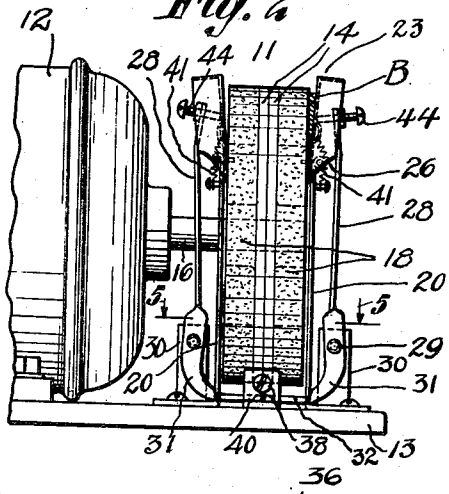


Fig. 3

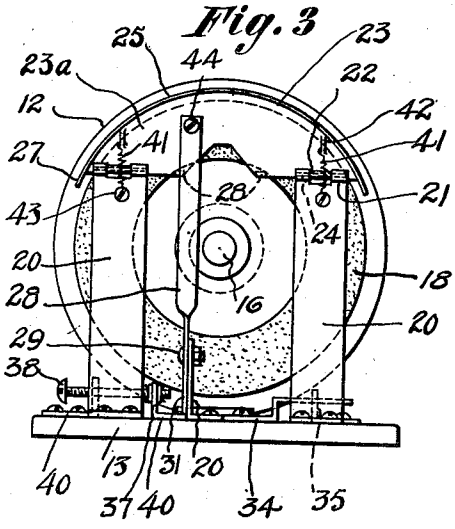
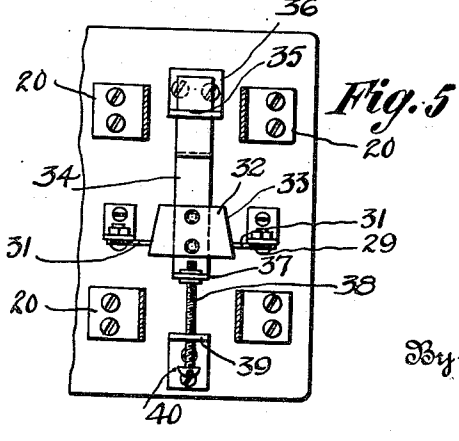


Fig. 5



Inventor

Harry Witzleben

By his Attorneys

Becker & Schumacher

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UNITED STATES PATENT OFFICE

HARRY WITZLEBEN, OF NEW YORK, N. Y.

KNIFE GRINDER

Application filed May 21, 1928. Serial No. 279,351.

This invention relates to grinding machinery.

One object of the invention is to provide a device of the character described comprising improved means for guiding a blade into engagement alongside a grinding wheel so as to form any desired bevel at the cutting edge of the blade.

Another object of the invention is the provision of a device of the character set forth in which unitary communicating means sets the guide means at both sides of the grinding wheel to form uniform angles therewith according to the edge to be formed on the blade.

A further object of the invention is to produce a device of the type mentioned wherein the guide means are set to any desired adjusted position through the coaction of resilient and positive means, each of which acts in an opposite direction on a guide.

Still another object of the invention is to furnish a device of the class referred to which comprises comparatively few and simple parts, is inexpensive to manufacture, may be adjusted rapidly and with facility and is reliable and efficient in use to a high degree.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a view in elevation of an embodiment of the invention with parts removed to show interior construction.

Fig. 2 is a similar view of the device but with the guide means set at a different angle with respect to the grinding wheel.

Fig. 3 is an end view in elevation of the device as seen on looking at the right end of Fig. 2.

Fig. 4 is a fragmentary horizontal sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a similar view taken on line 5—5 of Fig. 2.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Generally described, the invention provides an improved knife grinding machine made as a compact unit comprising a grinding wheel, a motor to rotate the same, and means associated with the wheel at both sides thereof for holding a blade in a predetermined position to form a desired bevel at the cutting edge thereof. The means referred to includes a plurality of brackets upon which guide members are hingedly mounted about horizontal axes so as to swing toward or away from the upper side portions of the wheel. Associated with the said members are a plurality of levers at the sides of the wheel, both of which are adapted to be actuated by a single cam member having a pair of cam faces having individual cooperation with the levers. The said cam is moved along the plane of the grinding wheel by a screw threaded member and acts as a wedge between the lower ends of the levers so that when the said ends are caused to be moved apart, the upper end of the levers move inward toward one another so as to swing the guide members toward the grinding wheel to form any desired angle with the faces thereof. Springs act on the guide members to move the same outward from the wheel in opposition to the levers. The levers are also provided at their upper ends with set screws for a preliminary adjustment of the guide members. The guide members also include integral stop lugs to limit the insertion of the knife, while at the ends of the members are projections which insure that the knife

will at all times be retained at the predetermined angle and co-operation with the grinding wheel.

Referring in detail to the drawing, 10 denotes a device embodying the invention. The same includes a grinding wheel 11 which may be of any suitable construction and is preferably driven by a motor 12. Supporting these parts as a compact unit is a base 13 which permits the grinding machine to be readily positioned wherever desired. The grinding wheel 11 includes a plurality of metal disk members 14 having hubs to receive the motor shaft 16 and be secured thereto by set screws 17. Rings 18 of any desired abrasive material are secured to the individual disk members 14 in any feasible manner and so provide the annular spaces 19 at the sides of the wheel.

A plurality of brackets 20 are fastened to the base 13 in vertical relation and in close proximity to the sides of the wheel. A pair of these brackets are on each side of the wheel and the larger face of each bracket is parallel to the wheel. At their upper ends the several brackets terminate in hinge portions 21 which receive therebetween the co-operating hinge portions 22 of the guide members 23. The usual pintles 24 pass through these hinge members and thus there is afforded a pair of bearings for each guide member 23, thereby insuring a high degree of stability to the latter.

The guide members 23 consist of the flat portions 23^a which are of segmental form and have their outer arcuate edges in proximity to the periphery of the grinding wheel. Each guide member includes likewise an arcuate flange 25 extending substantially at right angles to the flat portion 23^a and outwardly thereof with respect to the wheel. The flanges 25 are of substantially uniform width throughout and toward their ends are cut at an incline as shown at 26, thereby forming the tongues or projections 27. The latter are of sufficient length to extend inward of the plane of the side of the wheel so that the blade received between the guide member and the wheel will at all times be retained at the proper angle of engagement with the grinding wheel. The hinge portions 22 are preferably formed integral with the guide members and intervening between them is a considerable space within which may be struck a plurality of stop lugs 28 at a lower edge of the segmental portion. The said stop lugs limit the insertion or downward movement of a blade B.

According to the practice of this invention a blade is first sharpened at one side of the grinding wheel and then at the other side thereof, while being independently rotated by the motor 12. In order to form an equal bevel on both sides of the blade at the cutting edge thereof, it is desirable that the guide members be equally adjusted to form uniform angles with the sides of the grinding wheel. For this purpose and to insure that the machine can be set in a uniform and rapid manner according to the blade to be sharpened, a unitary means hereinafter described is provided for simultaneously setting and adjusting both of the guide members.

Accordingly a pair of levers 28 pivotally mounted at 29 on brackets 30 secured to the base 13 extend upwardly in approximately vertical position into engagement with the corresponding guide members. The lower ends 31 of the said levers extend toward one another and lie in the same plane transverse to the grinding wheel. Preferably the said ends 31 constitute inwardly curved followers lying beneath the said wheel. Acting between them simultaneously is a cam member 32 which is in the nature of a wedge, being provided with a plurality of cam faces 33 inclined toward one another. The cam member 32 is secured to a guide bar 34 which passes through a suitable slot in the flange 35 of a bracket 36. One end of the bar 34 is formed with an upstanding lug 37 within which a screw 38 has fixed but rotatable engagement, the said screw being threaded into a vertical flange 39 of a bracket 40 so that on turning the screw, the cam member 32 is moved along the plane of the grinding wheel and so as to actuate the levers 28 by moving the lower ends 31 thereof outward. Opposing the force exerted by the said levers on the guide members are a plurality of tension springs 41 tending to move the guide members away from the grinding wheel. Accordingly when the cam member 32 is moved toward the left as in Fig. 3, the lower ends of the levers 28 will be free to move inward toward one another, and such movement will be insured by the springs 41. The said springs are attached to the guide members by means of loops 42 struck directly in the latter. The other ends of said springs are attached to the brackets 20 by screws 43. The upper ends of the levers 28 may be provided with stop screws 44 to provide a preliminary adjustment as between the guide members and the levers. These screws 44 bear with their free ends directly against the sides of the segmental portions 23^a. Thus the desired slip connection is afforded that is necessary for free and unimpeded pivotal movement of the guide members. It will be observed that while the levers 28 are offset to one side of the shaft 16 in order to clear the same, that nevertheless owing to the uniform and balanced mounting for the guide members and the use of a plurality of springs 41 at both ends thereof, a high degree of evenness, reliability, and accuracy in operation may be obtained.

It will be appreciated that within the scope of the invention, the unitary actuating means for the guide members might assume various forms and that different types of screw

threaded members might be employed to set both guide members simultaneously into any desired adjusted position.

It is thus seen that I have provided a device that fulfills the several objects of this invention and meets the conditions of practical use.

I claim:

1. A device of the character described, including a grinding wheel, means to rotate the same, adjustable guide means for a blade to be sharpened by the wheel, said guide means being positioned at the sides of the wheel adjacent to an edge thereof, levers to separately actuate the guide means, and unitary cam means acting on the levers to set the guide means at any required inclination with the wheel according to the nature of the edge desired on the blade.

2. A device as set forth including a rotatable grinding wheel, guide members to hold a blade against the wheel to form any required bevel on the blade, pivoted elements to move the members in opposite directions laterally with respect to the wheel, and a single slidable wedge means acting on said elements to adjust the guide members.

3. A device as set forth including a rotatable grinding wheel, a guide member to hold a blade against the wheel, resilient means tending to move the member in one direction, and positive means to move the member in an opposite direction against the force of the resilient means to set the member in adjusted position, said means including a lever acting at one end on the guide member, and having a cam on its other end, and an actuator to coact with the cam to move the lever and adjust the guide member.

4. A device of the character described, including a rotary grinding wheel, a base on which the same is mounted, supports on the base on opposite sides of the wheel, guides hingedly mounted on the supports, said guides being movable to cause a blade to be ground at any required angle, a pair of levers at opposite sides of the wheel, said levers separately coacting with the guides to adjust the same, said levers being pivotally mounted on the base, and unitary means to equally actuate both levers.

5. A device of the character described, including a rotary grinding wheel, pivoted adjustable blade guides at the sides of said wheel, separate pivoted elements for adjusting the blade guides, unitary wedge means for separately acting on said elements, and a fixed guide along which the unitary means is lengthwise movable, whereby the blade guides are set at precisely equal angles with the wheel to assure an equal bevel on both sides of the blade.

6. A device of the character described, including a rotary grinding wheel, adjustable blade guides at the sides of said wheel, means pivotally mounting said guides to form any desired angle with the wheel, over a considerable range, and unitary sliding wedge means acting simultaneously on both said guides to move the same positively toward the wheel in exactly equal angles with the wheel for both guides, and the wheel being positioned in a substantially fixed plane.

7. A device of the character described, including a grinding wheel, separate blade guides hinged at opposite sides of the wheel, means movably supporting the blade guides for forming different angles with the sides of the wheel, and unitary means for actuating the blade guides through equal angles with the sides of the wheel.

In testimony whereof I affix my signature.

HARRY WITZLEBEN.