No. 799,641. PATENTED SEPT. 19, 1905.

W. R. FOX.

GRINDING MACHINE.

APPLICATION FILED OCT. 24, 1904.

2 SHEETS—SHEET 1.

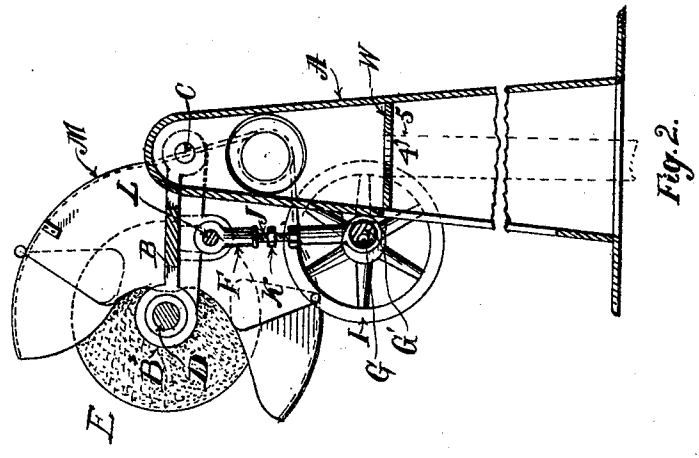


Fig. 2.

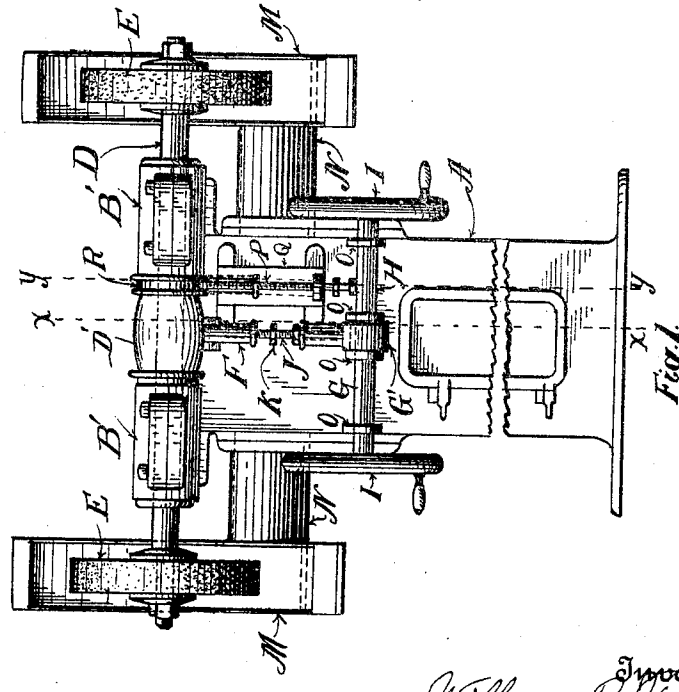


Fig. 1.

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2 SHEETS—SHEET 2.

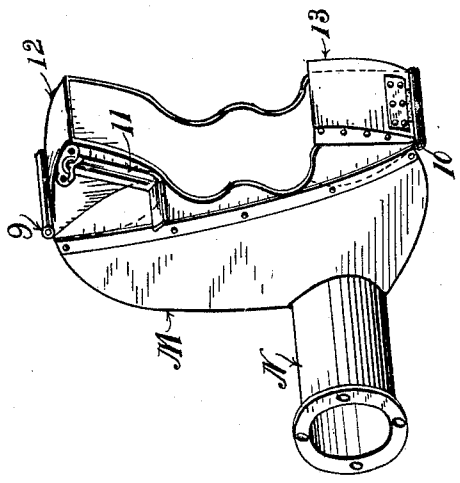


Fig. 4.

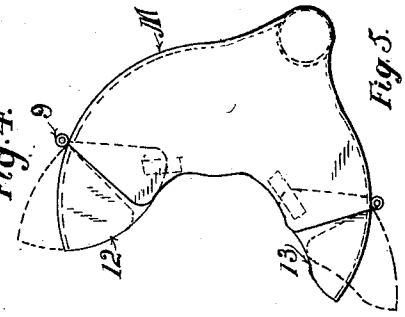


Fig. 5.

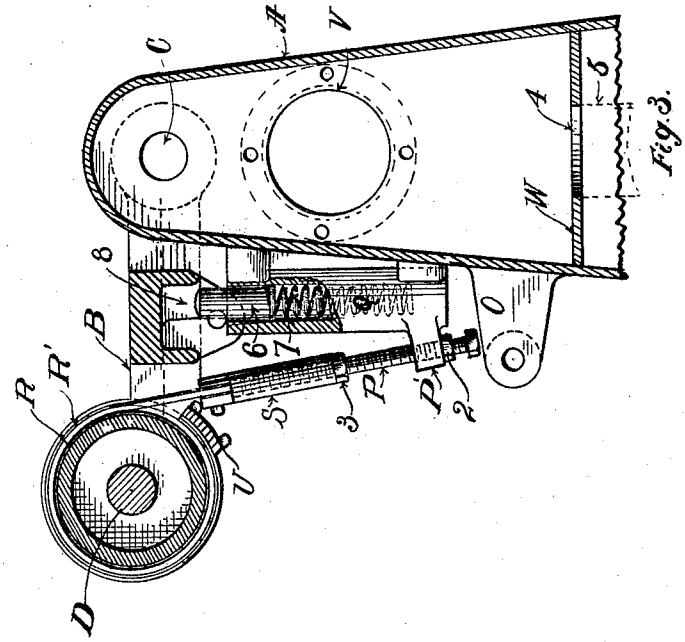


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM R. FOX, OF GRAND RAPIDS, MICHIGAN.

GRINDING-MACHINE.

No. 799,641. Specification of Letters Patent. Patented Sept. 19, 1905.

Application filed October 24, 1904. Serial No. 229,794.

To all whom it may concern:

Be it known that I, WILLIAM R. FOX, a citizen of the United States, residing at the city of Grand Rapids, county of Kent, State of Michigan, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

This invention relates to improvements in grinding-machines, although the improvements are adapted to other uses, as to polishing and buffing machines, saws, or other rotary tools.

The objects of this invention are, first, to provide an effective means of throwing such machines into and out of operation; second, to provide an improved means of protecting the bearing parts by a special arrangement of parts; third, to provide an improved means of inducting away the dust and particles from such a machine.

Other objects relating to details of construction will definitely appear from the description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front elevation view of my improved grinding-machine, the base part being shown in broken sections. Fig. 2 is a detail vertical sectional elevation view taken on a line corresponding to line $x\ x$ of Fig. 1 looking toward the left. Fig. 3 is an enlarged detail sectional view taken on a line corresponding to the irregular line $y\ y$ of Fig. 1 looking toward the left, the counterbalance-spring being shown on the section a little to the left of the main line $y\ y$. Fig. 4 is an enlarged detail perspective view of the shield and dust-collector, embracing one of the grinding-wheels, the right-hand shield being shown here. Fig. 5 is a detail end elevation view of such a shield and collector, the mouth of the same being indicated as adjustable by dotted lines.

In the drawings similar characters of reference refer to similar parts throughout the several views.

Referring to the drawings, the base A is hollow with a suitable flange extension for attachment to the floor. A door is provided for access to the interior. The upper portion is separated by a diaphragm W, which contains an aperture 4 at its center, to which a pipe 5, as indicated by dotted lines, may be connected for inducting away the dust and particles from the grinding. Supported on a suitable trunnion C at the upper end of this base is an arm B, extending forwardly therefrom and provided with a pair of boxings B′ B′. Through these boxings extend a shaft D, and a pulley D′ is secured at the center by any suitable means. A belt (not shown) extends from a shaft above for the purpose of driving the grinding-wheels E E, which are supported at each end of the shaft D.

The shaft H is supported in suitable eyes O O O O on the side of the base or may be supported by an independent support at this point. This shaft is controlled by hand-wheels I I at each end. On this shaft is an eccentric G, which is connected by an adjustable connection to the arm B above. This connection consists of an eccentric-band G′, having a hollow sleeve transverse thereto connecting to a sleeve F above by an adjustable screw J. This screw J is right-handed above and left-handed below and is adjustable by a nut K, so that the exact length of the connection from the eccentric to the arm B can be closely regulated. A pivot L connects the sleeve F to the arm B.

On a small wheel R, secured to the pulley D′ or the shaft D, whichever is most convenient, is a band-brake R′, extending around the same and secured to a suitable support U on the arm B. This brake is connected by the rod S and screw P to a lug P′, projecting from the frame A below, so that when the arm B is allowed to swing up the brake R′ is automatically tightened on the wheel R and immediately stops its movement.

A plunger 6 is in a socket Q on the base A and is held normally upward by a coiled spring 7. This plunger contacts with the boss 8 on the under side of the arm B and serves as a counterbalance therefor, making the same easy to operate.

The base A being hollow is connected to suitable hoods M, which surround the grinding-wheels E, these hoods having a trunk N, suitably flanged, which are secured to embrace the opening V on the side of the machine. The walls of the hood M embrace both sides of the grinding-wheel E and have adjustable flaps 12 and 13, which are hinged at 9 and 10 to what might be regarded as the

"periphery" of the hood and are adjustable by thumb-screws in the slots 11 to closely embrace said grinding-wheel, as clearly appears from Figs. 2, 4, and 5.

In operation when it is desired to throw the machine into gear the hand-wheels are turned over, so that the eccentric by its connection pulls the arm B downward. This tightens the belt on the pulley D' and throws the machine into operation. The operator brings any article that he desires to be ground or, in the event that the machine is used as a polisher, to be polished into contact with the wheels E. By closing the flaps of the hood well down toward the wheel the grindings are drawn into and down through the hollow base A, so that all dust and particles of metal are carried away from the workman and conducted out of the compartment where the machine is used, so that the machine is a very satisfactory machine in operation. When the workman is through, he simply gives the hand-wheels I a throw upwardly, and through their connections they lift the arm B upwardly, which of course slacks the driving-belt. The brake R' is applied by the same movement, which immediately stops the machine and, the whole being counterbalanced, makes it easy to operate.

It will be seen that this machine is a double machine, having grinders at each side, and is very effective and satisfactory on that account, though of course but a single grinding-wheel might be used.

While I have shown the grinding-wheels supported on a pivoted arm, I desire to remark that they may be supported in a variety of ways so long as they can be moved readily up and down to tighten or slacken the belt. I show only the means preferred by me, which I desire to claim broadly as well as specifically.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B' carried by said arm; a shaft D with a driving-pulley D' in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B consisting of a socket G on said base, a plunger 6 in said socket, and a spring 7 for throwing said plunger up against the under side of the arm B; a brake mechanism consisting of the band R' secured to the base A and embracing a brake-wheel R at the end of the pulley D', the upper end of said brake being secured to a lug U on the arm B whereby the brake will be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M with adjustable flaps 12 and 13, embracing the said grinding-wheels E, provided with trunks N connecting the same to the said hollow base, all coacting substantially as described and for the purpose specified.

2. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B' carried by said arm; a shaft D with a driving-pulley D' in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B; a brake mechanism consisting of the band R' secured to the base A and embracing a brake-wheel R at the end of the pulley D', the upper end of said brake being secured to a lug V on the arm B, whereby the brake will be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M with adjustable flaps 12 and 13, embracing the said grinding-wheels E, provided with trunks N connecting the same to the said hollow base, all coacting substantially as described and for the purpose specified.

3. In a machine of the class described, the combination of a hollow base; an arm B pivoted to the said base; boxings B' carried by said arm; a shaft D with a driving-pulley D' in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B, consisting of a socket K on said base, a plunger 6 in said socket, and a spring 7 for throwing said plunger up against the under side of the arm B; a brake mechanism connected to be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M with adjustable flaps 12 and 13, embracing the said grinding-wheels E, provided with trunks N connecting the same to the said hollow base, all coacting substantially as described and for the purpose specified.

4. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B' carried by said arm; a shaft D with a driving-pulley D' in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and

left hand screw J; a counterbalance for the arm B; a brake mechanism connected to be applied automatically when the arm is swung upwardly to slacken the driving-belt; hoods M with adjustable flaps 12 and 13, embracing the said grinding-wheels E, provided with trunks N connecting the same to the said hollow base, all coacting substantially as described and for the purpose specified.

5. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B′ carried by said arm; a shaft D with a driving-pulley D′ in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B, consisting of a socket K on said base, a plunger 6 in said socket, a spring 7 for throwing said plunger up against the under side of the arm B; a brake mechanism consisting of a band R′ secured to the base A and embracing a brake-wheel R at the end of the pulley D′, the upper end of said brake being secured to a lug V on the arm B whereby the brake will be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M embracing the said grinding-wheels E, all coacting substantially as described and for the purpose specified.

6. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B′ carried by said arm; a shaft D with a driving-pulley D′ in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B; a brake mechanism consisting of a band R′ secured to the base A and embracing a brake-wheel R at the end of the pulley D′, the upper end of said brake being secured to a lug V on the arm B whereby the brake will be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M embracing the said grinding-wheels E, all coacting substantially as described and for the purpose specified.

7. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B′ carried by said arm; a shaft D with a driving-pulley D′ in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B consisting of a socket K on the said base, a plunger 6 in said socket, and a spring for throwing said plunger up against the under side of the arm B; a brake mechanism connected to be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M with adjustable flaps 12 and 13, all coacting substantially as described and for the purpose specified.

8. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; boxings B′ carried by said arm; a shaft D with a driving-pulley D′ in said boxings; grinding-wheels E on said shaft; a shaft H supported in suitable bearings O on the base; a hand-wheel I for operating the said shaft; an eccentric G on the said shaft; an adjustable connection from said eccentric to a pivot L on the arm B, the connection being made adjustable by a right and left hand screw J; a counterbalance for the arm B; a brake mechanism connected to be applied automatically when the arm is swung upwardly to slacken the driving-belt; and hoods M with adjustable flaps 12 and 13, all coacting substantially as described and for the purpose specified.

9. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to said base; a shaft with driving-pulley and grinding-wheel thereon carried in suitable bearings by said arm; an eccentric on a suitable shaft with means for actuating the same and connections from the said eccentric to the arm B for adjusting the same; a counterbalance for the arm; a brake connected to be applied when the arm is moved to slacken the driving-belt; and a hood embracing the grinding-wheel, connected to the hollow base, coacting for the purpose specified.

10. In a machine of the class described, the combination of a base A; an arm B pivoted to the said base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable bearings by said arm; an eccentric on a suitable shaft with means for actuating the same and connections from the said eccentric to the arm B for adjusting the same; and a brake connected to be applied when the arm is moved to slacken the driving-belt, coacting for the purpose specified.

11. In a machine of the class described, the combination of a hollow base A; an arm B pivoted to the said base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable bearings by said arm; an eccentric on a suitable shaft, with means for actuating the same and connections from the said eccentric to the arm B for adjusting the same; a counterbalance for the arm; and a

hood embracing the grinding-wheel, connected to the hollow base, coacting for the purpose specified.

12. In a machine of the class described, the combination of a base A; an arm B pivoted to the said base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable bearings by said arm; an eccentric on a suitable shaft, with means for actuating the same and connections from the said eccentric to the arm B for adjusting the same, coacting for the purpose specified.

13. In a machine of the class described, the combination of a hollow base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable adjustable bearings supported by said base; means for adjusting the bearings up and down for the purpose of putting tension on the driving-belt; a brake-belt connected to be applied when the belt is slackened; a counterbalance for the parts; and a suitable hood embracing the grinding-wheel connected to the hollow base for carrying away the dust, for the purpose specified.

14. In a machine of the class described, the combination of a base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable adjustable bearings, supported by said base; means for adjusting the bearings up and down for the purpose of putting tension on the driving-belt; a brake-belt connected to be applied when the belt is slackened; and a counterbalance for the parts, for the purpose specified.

15. In a machine of the class described, the combination of a hollow base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable adjustable bearings supported by said base; means for adjusting the bearings up and down for the purpose of putting tension on the driving-belt; and a suitable hood embracing the grinding-wheel connected to the hollow base for carrying away the dust, for the purpose specified.

16. In a machine of the class described, the combination of a base; a shaft with driving-pulley and grinding-wheel thereon, carried in suitable adjustable bearings, on an arm pivotally supported by said base; and means for adjusting the bearings up and down for the purpose of putting tension on the driving-belt, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

WILLIAM R. FOX. [L. S.]

Witnesses:
GEO. K. MCMULLEN,
KATHARINE KUNZI.