No. 741,337. PATENTED OCT. 13, 1903.

H. D. HIBBARD.

GRINDING MACHINE.

APPLICATION FILED DEC. 4, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

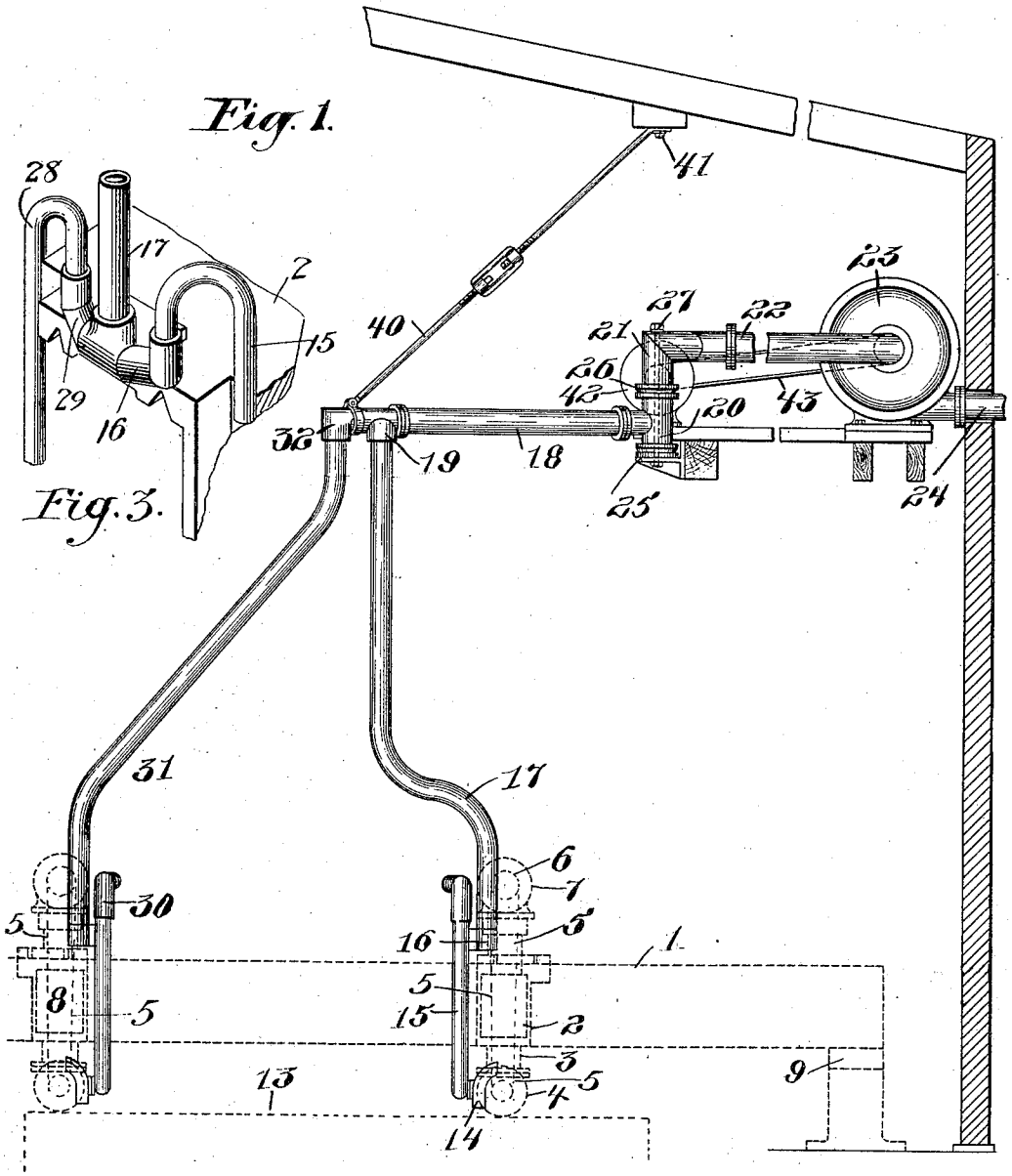


Fig. 3.

Witnesses:-
F. L. Fliedner.
B. L. Stickney.

Inventor;
H. D. Hibbard.
By his Attorney.
F. A. Richards.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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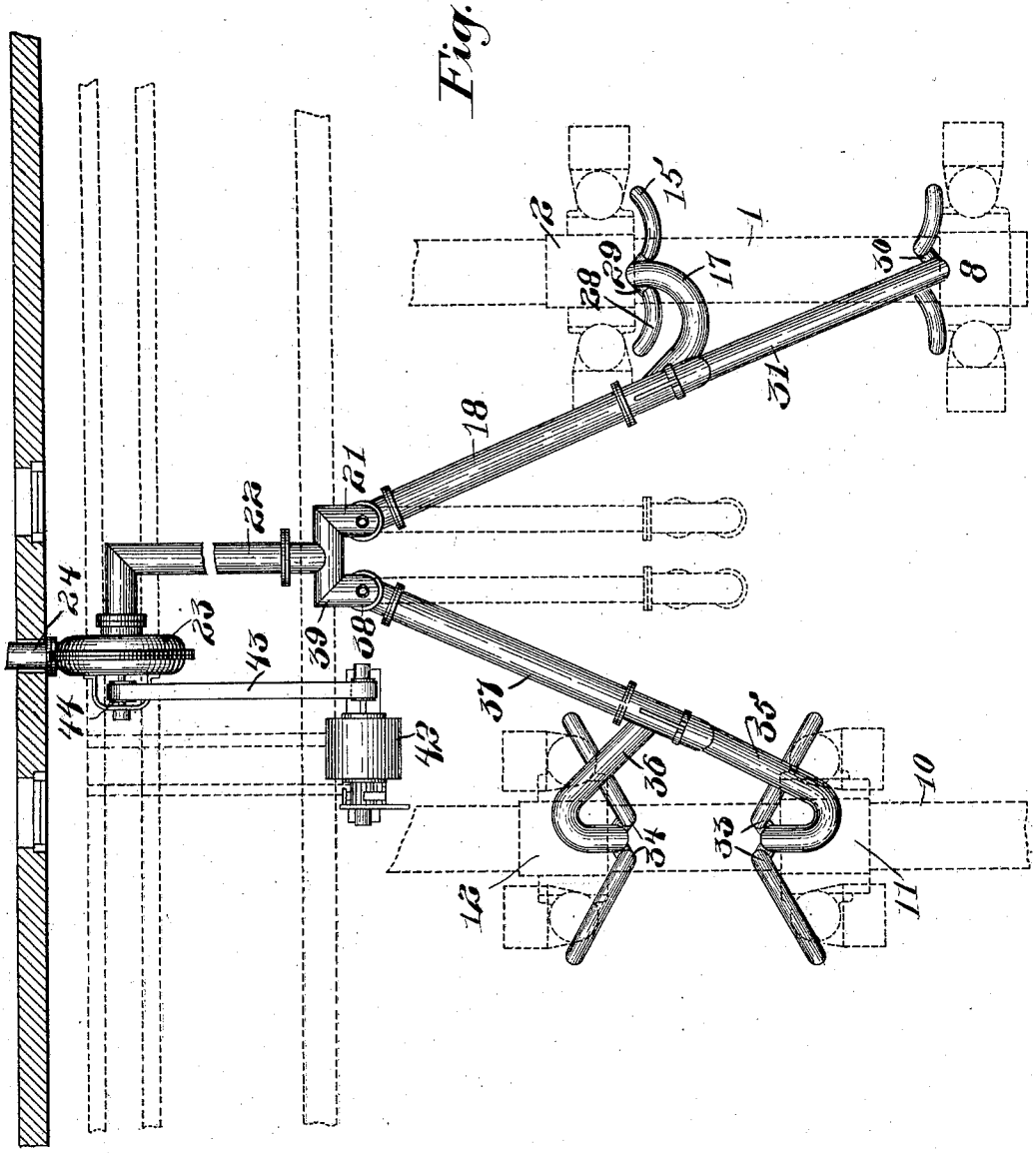
H. D. HIBBARD.

GRINDING MACHINE.

APPLICATION FILED DEC. 4, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
F. C. Fliedner.
John A. Seifert.

Inventor,
H. D. Hibbard,
By his Attorney,
F. H. Richards.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 741,337. Patented October 13, 1903.

UNITED STATES PATENT OFFICE.

HENRY DEMING HIBBARD, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO MANGANESE STEEL SAFE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 741,337, dated October 13, 1903.

Application filed December 4, 1902. Serial No. 133,808. (No model.)

To all whom it may concern:

Be it known that I, HENRY DEMING HIBBARD, a citizen of the United States, residing in Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

This invention relates to apparatus for disposing of the grit produced at the grinding of metallic and other articles, so as to avoid the liability of the bearings of the grinding-machine becoming injured by the deposit of the grit therein. The improvements may be applied in whole or in part to other than grinding-machines.

One of the objects of the present invention is to provide a simple apparatus for conveying the grit from a number of grinding-wheels which are independently movable to and fro over the work.

In the accompanying drawings, Figure 1 is an elevation, and Fig. 2 a plan, of my improvements connected to a grinding-machine such as that described in my pending application, Serial No. 108,764, filed May 24, 1902, which is adapted to grind the surfaces and edges of massive bodies, such as safes or vault-sections. Fig. 3 is a perspective detail illustrating particularly the manner of connecting certain parts of the exhausting-conduits.

Upon the bed 1 is mounted saddlewise a carriage 2, having at each side of the bed depending parts 3, which carry at their lower ends grinding-wheels 4. Each grinding-wheel is connected by a belt 5 to pulley 6 of a motor, the motors being mounted at the upper portion of the carriage. By suitable means the carriage may be driven to and fro longitudinally of the bed. Preferably one or more additional carriages 8, similarly provided with grinding-wheels and motors, are independently movable along said bed, while the bed itself is movable to and fro along fixed ways 9, whereby either of the grinding-wheels may be brought into contact with almost any portion of the work. The provision of a plurality of carriages expedites the process of the work, while by having a plurality of grinding-wheels on each carriage it is possible to make a roughing cut and a finishing cut by a simple movement of the carriage or bed, which is an advantage. As will be seen in Fig. 2, a second bed 10 may move to and fro over the same ways 9 independently of the first bed 1, and upon the bed 10 may be provided a plurality of similar carriages 11 and 12, each having a plurality of motors and grinding-wheels. The work over which the grinding-wheels are moved is indicated at 13, Fig. 1.

For disposing of the products of grinding each grinding-wheel is provided with a hood 14, the latter being connected by a vertical pipe 15 and connection 16 or otherwise to a length of hose or flexible pipe 17, depending from a horizontal pipe 18, to which it is connected at 19. The hose is of sufficient length and flexibility to maintain connection between the traveling carriage 2 and the pipe 18 during the movement of the former to and fro along the bed 1. The pipe 18, which is connected at its outer or free end to said pendent hose, is at its inner end swiveled, by means of a T 20, to an elbow 21, the latter communicating, by means of a pipe 22, to a stationary exhauster 23, which drives the grit out through an outlet 24. The exhauster 23, it will be noticed, is preferably located a considerable height above the grinder, where it is out of the way and whereby freedom of movement of the hose 17 is permitted. The lower end of the T 20 is supported upon a step 25, while the upper end is pivotally jointed at 26 to the elbow 21, a tight connection being maintained by means of a central vertical bolt 27. The object of swiveling the length of pipe 18 is to enable it to swing, and hence accompany the movements of the bed 1 along the ways 9, so that communication between the grinding-wheel and exhauster is maintained through all the movements of the former in any direction over the work. As will be seen at Fig. 2, the other grinding-wheel upon said carriage 2 is similarly connected, by means of a pipe 28 and connection 29, to the same hose 17. The grinding-wheels on the carriage 8 are likewise provided with

hoods, the latter having connections at 30 with the hose 31 and the latter being connected at 32 to the outer end of the swiveled pipe 18. The hose 21 permits movement of the carriage 8 independent of the carriage 2, so that the former is also in constant communication with the exhauster.

Referring to Fig. 2, it will be observed that the carriages 11 and 12 are similarly provided with pipes 33 and 34, communicating with lengths of hose 35 and 36, which depend from a second pipe 37, which is swiveled at 38 to an elbow 39, whose relation to the conductor 22 is similar to that of the elbow 21, whereby all of the grinding-wheels, no matter to what part of the work they are carried, are in constant connection with the exhauster.

Each of the swiveled pipes 18 may be supported by a swiveled guy 40, connected to the outer end of the pipe and extending diagonally up to a pivotal connection 41 with a fixture, said connection 41 being preferably in line with the axis 27 of the swivel-joint. The exhauster may be operated by means of a motor 42, connected by a belt 43 to a pulley 44 upon the axis of the exhaust-fan.

Variations may be resorted to within the scope of my invention, and portions of my improvements may be used without others.

Having thus described my invention, I claim—

1. The combination with a grinding-wheel, and longitudinal and transverse ways determining the longitudinal and transverse traverse of the wheel over the work, of means for expelling the grit during the grinding operation.

2. The combination with a grinding-wheel, and longitudinal and transverse ways determining the transverse and longitudinal traverse of the wheel over the work, of an exhaust apparatus, and a length of flexible hose interposed between the exhaust apparatus and the wheel.

3. The combination with a grinding-wheel, and longitudinal and transverse ways determining the longitudinal and transverse traverse of the wheel over the work, of an exhaust apparatus, a hood for the wheel, a radial suction-pipe pivotally supported at one end, and a length of flexible hose interposed between said suction-pipe and the hood.

4. The combination of a plurality of grinding-wheels, longitudinal ways upon which said wheels are mounted, transverse ways upon which said longitudinal ways are mounted, said ways determining the traversing movements of the wheels, hoods for the wheels, a radial suction-pipe pivotally supported at one end, and a length of flexible hose between said radial suction-pipe and said hoods, said hose-lead having branches leading to said hoods.

5. The combination of a plurality of grinding-wheels, longitudinal ways upon which said wheels are mounted, transverse ways upon which said longitudinal ways are mounted, said ways determining the traversing movements of the wheels, a radial suction-pipe pivotally supported at one end and having a plurality of inlets, hoods for the wheels, and lengths of flexible hose interposed between said inlets and said plurality of wheels.

6. The combination of a plurality of sets of grinding-wheels, longitudinal ways upon which said wheels are mounted, transverse ways upon which said longitudinal ways are mounted, said ways determining the traverse movements of the wheels, a fixed suction-pipe, a radial suction-pipe jointed thereto and having a plurality of inlets, hoods for the wheels, and a length of flexible hose interposed between each said branches, outlets and the hoods of one of the sets of wheels, each length of hose having branches leading to the respective hoods of the set.

7. The combination of a plurality of sets of grinding-wheels, longitudinal ways upon which said wheels are mounted, transverse ways upon which said longitudinal ways are mounted, said ways determining the traverse movements of the wheels, hoods for the wheels, a fixed suction-pipe, a plurality of radial suction-pipes each having a jointed connection at one end with said fixed pipe and a plurality of inlets, and a length of flexible hose interposed between each of said outlets and the hoods of one of the sets of grinding-wheels, each length of hose having branches leading to the respective hoods of the set.

8. The combination of a fixed suction-pipe, a horizontally-swinging radial suction-pipe jointed thereto, means for supporting the free end of said swinging pipe, grinding-wheels, longitudinal ways upon which said wheels are mounted, transverse ways upon which said longitudinal ways are mounted, a motor mounted with each grinding-wheel for rotating the same, and a length of flexible hose interposed between said swinging suction-pipe and said wheels.

9. The combination of a fixed suction-pipe, a horizontally-swinging radial suction-pipe jointed thereto, means for supporting the free end of said swinging pipe, longitudinal ways, a grinding-wheel mounted on each side of said longitudinal ways, a motor mounted with each grinding-wheel for rotating the same, transverse ways upon which said longitudinal ways are mounted, and a length of flexible hose interposed between said swinging suction-pipe and said wheels.

10. The combination with a fixed suction-pipe, of a horizontally-swinging suction-pipe jointed thereto and having a plurality of inlets, means for supporting the free end of said swinging suction-pipe, a set of longitudinal ways, a plurality of independent sets of grinding-wheels mounted on such ways, transverse ways upon which the longitudinal ways are mounted, and a length of flexible hose interposed between each of said inlets and

a set of grinding-wheels, each length of hose having branches leading to the respective wheels in the set.

11. The combination of a fixed suction-pipe, a plurality of horizontally-swinging suction-pipes jointed thereto and each having a plurality of inlets, means for supporting the free end of each such swinging pipe, a plurality of sets of longitudinal ways, a plurality of sets of grinding-wheels mounted on each of such ways, transverse ways upon which the several sets of longitudinal ways are mounted, and a length of flexible hose interposed between each inlet of one of said swinging suction-pipes and one of the sets of grinding-wheels mounted on one of the longitudinal ways, each length of hose having branches leading to the respective grinding-wheels in the set.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 2d day of December, 1902.

HENRY DEMING HIBBARD.

Witnesses:
B. C. STICKNEY,
FRED. J. DOLE.