(Model.)

G. HART.

Emery-Wheel.

No. 226,066 Patented Mar. 30, 1880.

FIG I

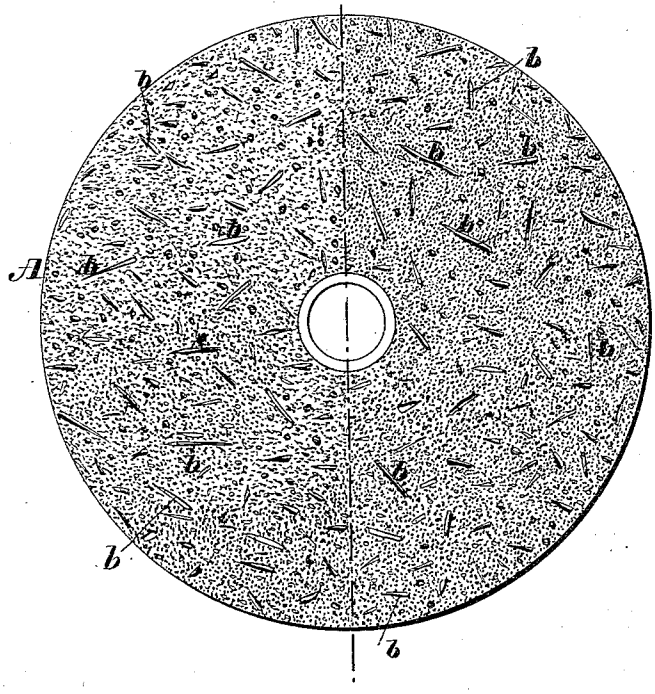


FIG II

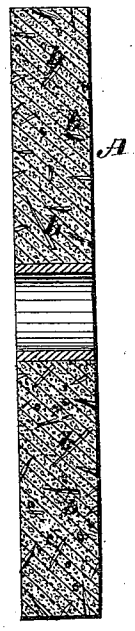
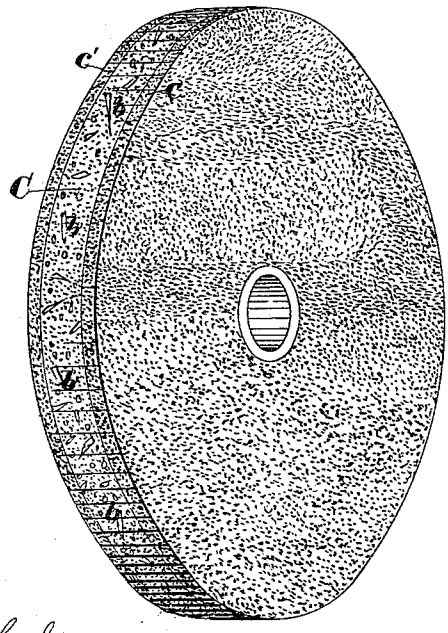


FIG III



WITNESSES

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EMERY-WHEEL.

SPECIFICATION forming part of Letters Patent No. 226,066, dated March 30, 1880.

Application filed March 5, 1880. (Model.)

To all whom it may concern:

Be it known that I, GILBERT HART, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Emery-Wheels, of which the following is a specification.

This invention relates to that class of grinding and polishing wheels which are molded from plastic compositions, its object being to provide against the well-known tendency of such wheels to burst or break both laterally and circumferentially from centrifugal strain when rotated at the high speed required for their efficient action.

It has been customary to brace and strengthen this class of grinding and polishing wheels by embedding within the composition at the time of molding a metal plate or disk arranged concentrically with the wheel, or two such parallel disks, one or more disks of wire-cloth, or plates of perforated sheet metal; but in all of these modes of bracing there are left portions of the composition extending from center to periphery of a wheel on each side of and between the braces which are not strengthened, and owing to which the wheel has still a tendency to split laterally, and there is liability of the peripheral portions of these embraced layers to fly off circumferentially.

Wheels have also been formed from compositions having mixed therewith hard abrading substances, such as pulverized glass, fine granulated iron, fine iron or steel filings and borings, and steel wires arranged radially; but in these wheels the said hard abrading substances form the effective working surfaces of the wheel, and are simply held in position by the plastic portion of the composition.

My present invention differs from all those mentioned in providing a grinding and polishing wheel in which the abrading and polishing substance is composed of a plastic composition of emery, corundum, or similar material, thoroughly braced by means of embedded fragments of metal, such as short pieces of wire mixed at random, as far as relative position is concerned, but about evenly as to quantity in the composition while in its plastic condition before molding, the wire or metal fragments being of such nature as to wear away evenly with or more easily than the composition. There are thus left no unbraced diametric layers of the composition, rendering the wheel weaker in any direction than in others.

In the accompanying drawings, Figure I is a side view of a composition grinding and polishing wheel constructed according to my invention. Fig. II is a diametric section of the same. Fig. III is a view of a modification of the wheel.

The letter A designates the main body of the wheel, which may be formed of any of the ordinary abrading and polishing compositions containing emery, corundum, or similar material, and *b* indicates short pieces of wire, preferably copper wire, though fragments of other metals may be used provided they are of such nature as to wear away evenly with or more easily than the composition. These short pieces of wire or fragments of metal, it will be observed, are thoroughly mixed in the composition without regard to regularity of position or direction, and thus form a binding and bracing medium, giving a practically uniform strength to the entire mass in which it is located as regards both circumferential and lateral strain.

The fragments of wire or other forms of metal are to be introduced and mixed with the composition before the mass is placed in the mold, which may be of the usual construction for molding composition wheels, and the subsequent dressing and curing of the wheel should be in accordance with the usual methods.

Owing to the nature of the wire or metal fragments to wear away readily when the wheel is used, they do not at all interfere with the abrasive and polishing action of the composition, while forming effective bracing.

In molding a wheel according to the modification shown in Fig. III, I first place upon the bottom of the mold a thin layer, *c*, of the composition without admixture of the metal fragments. Upon this is then laid a thicker central layer, C, of the composition having the metal fragments mixed therewith, and upon this central layer is then placed another outside layer, *c'*, of the plain composition. When the central layer is laid it should be pressed

upon the first-laid layer of plain composition, so that a portion of its metal fragments will partially penetrate the said plain layer, but not pass through the same, and when the last layer of plain composition is laid it should be pressed upon the central layer for the same purpose. The adjacent surfaces of the several layers soon agglomerate and become homogeneous, so that when completed the wheel has plain composition side faces suitable for light-pressure polishing, the wheel being practically as thoroughly braced as though the metal fragments appeared on the side faces.

What I claim is—

A grinding and polishing wheel in which the abrading and polishing substance is composed of a plastic composition of emery, corundum, or similar material braced by means of embedded fragments of metal mixed irregularly or at random therein, and of such nature as to wear away by friction as readily or more readily than the composition of which the main body of the wheel is formed, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GILBERT HART.

Witnesses:
JAMES L. NORRIS,
JAMES A. RUTHERFORD.