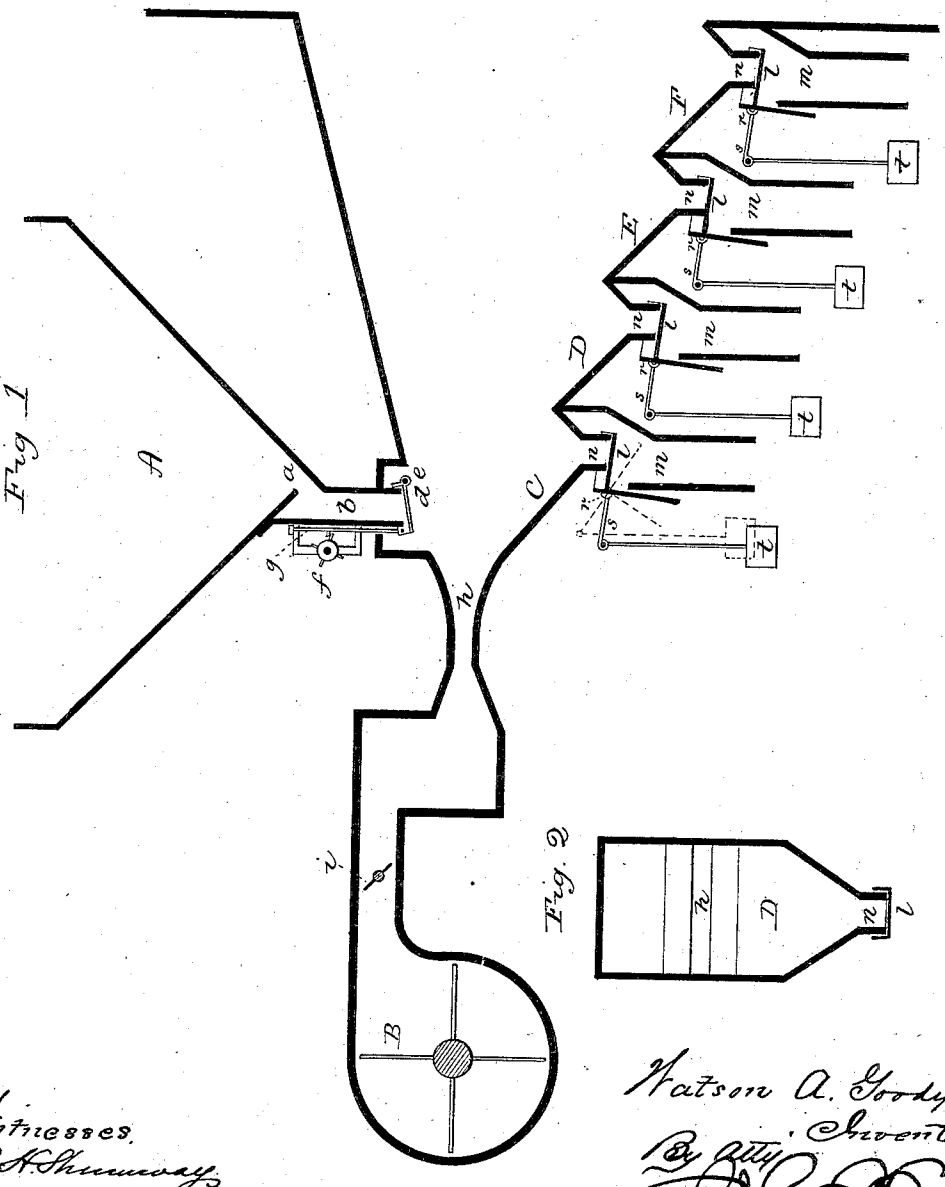
(No Model.)

W. A. GOODYEAR.

APPARATUS FOR GRADING THE PARTICLES OF CRUSHED STONES, ORES, &c.

No. 309,043. Patented Dec. 9, 1884.



Witnesses.
J. H. Shumway.
W. C. Earle

Watson A. Goodyear
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UNITED STATES PATENT OFFICE.

WATSON A. GOODYEAR, OF NEW HAVEN, CONNECTICUT.

APPARATUS FOR GRADING THE PARTICLES OF CRUSHED STONES, ORES, &c.

SPECIFICATION forming part of Letters Patent No. 309,043, dated December 9, 1884.

Application filed June 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, WATSON A. GOODYEAR, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Apparatus for Grading the Particles of Crushed Stones, Ores, &c.; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a sectional side view of the apparatus, and in Fig. 2 a vertical section of the same through the hopper D, looking toward the blast.

This invention relates to an apparatus for separating the particles of crushed stones, ores, and like materials into classes or grades—that is, into classes of certain size or of certain specific gravity.

The object of my invention is to contruct an apparatus in which an air-blast may be employed, and the particles separated by their own specific gravity—that is to say, the blast applied to the mass of particles falling will throw them out of the line of falling according to their specific gravity, the lightest going the farthest from the mass, and the heaviest falling first; and it consists in an apparatus, as more fully hereinafter described and claimed, whereby the object of the invention is accomplished.

A represents the hopper or receptacle into which the crushed, pulverized, or powdered material is deposited from the crushing apparatus or otherwise. It is of usual hopper-shape, with a delivery-mouth, *a*, at the bottom. From this mouth the material falls through a spout, *b*, to a shoe, *d*, hinged at one side, as at *e*, and to this shoe a vertical vibratory or jarring movement is imparted by a toothed wheel, *f*, through a rod, *g*, having a pin, in connection with the free end of the shoe. This illustration of imparting the vibratory movement to the shoe will be sufficient to enable those skilled in the art to apply any of the known devices for imparting such a shaking, agitating, or vibratory movement to the shoe as will cause the material falling thereon to escape from the shoe, and from which it falls by its own gravity. Below the shoe is an air-orifice, *h*, preferably of trumpet shape, through which an air-blast is driven—say as by a fan-blower, B, the air-blast being regulated by a valve, *i*. From the blast-mouth a series of hoppers, C D E F, &c., are arranged in a gradually-descending plane. The blast strikes the mass as it falls from the shoe *d*, and by its force throws the particles forward over the hoppers. The heavier particles will be the least affected, and will fall, say, into the hopper C, the next grade into the hopper D, and the third into the hopper E, &c., the finer particles continuing on to successive hoppers. The particles are thus separated according to their weight or specific gravity, and each grade deposited in its respective hopper, from which it may be removed. To make this removal automatic I arrange a false bottom, *l*, to each hopper, and over a delivery-spout, *m*. These false bottoms are hinged at one side of the openings *n* in the bottoms of the respective hoppers, as at *r*, and from these false bottoms arms *s* extend to the opposite sides of the hinges, forming with the bottoms levers. To each arm *s* a weight, *t*, is hung. These weights are considerably less than the capacity of their respective hoppers. So soon as the hopper—say C—shall have been filled to such an extent that the weight of the material upon the false bottom overbalances the weight *t*, then the bottom *l* will be turned upon its pivot *r*, as seen in broken lines, and dump the contents of the hopper into the delivery-spout *m* below, from which it may be conducted to any suitable receptacle prepared for it. The space surrounding and over the hoppers C D, &c., should be inclosed, as shown, to form a blast-chamber, within which the distribution or grading is made.

I claim—

The herein-described machine, comprising the hopper A, a shoe, *d*, hinged at the delivery-mouth of said hopper, mechanism, substantially such as described, to impart agitation to said shoe, a chamber into which the material passing from the hopper over the shoe may fall, an air-inlet, *h*, directed upon the material falling from said shoe, mechanism, substantially such as described to impart an air-blast through said inlet, a series of hoppers, C D E, &c., arranged successively at one side of the shoe opposite to the air-inlet, a false bottom, *l*, for each hopper, and a counterbalance for each false bottom, substantially as and for the purpose described.

Witnesses: WATSON A. GOODYEAR.

JOHN E. EARLE,

JOS. C. EARLE.