(3.) 2 Sheets--Sheet 1.

J. J. WEBSTER.

Improvement in Pulverizing and Grinding Machines.

No. 122,748. Patented Jan. 16, 1872.

FIG. I.

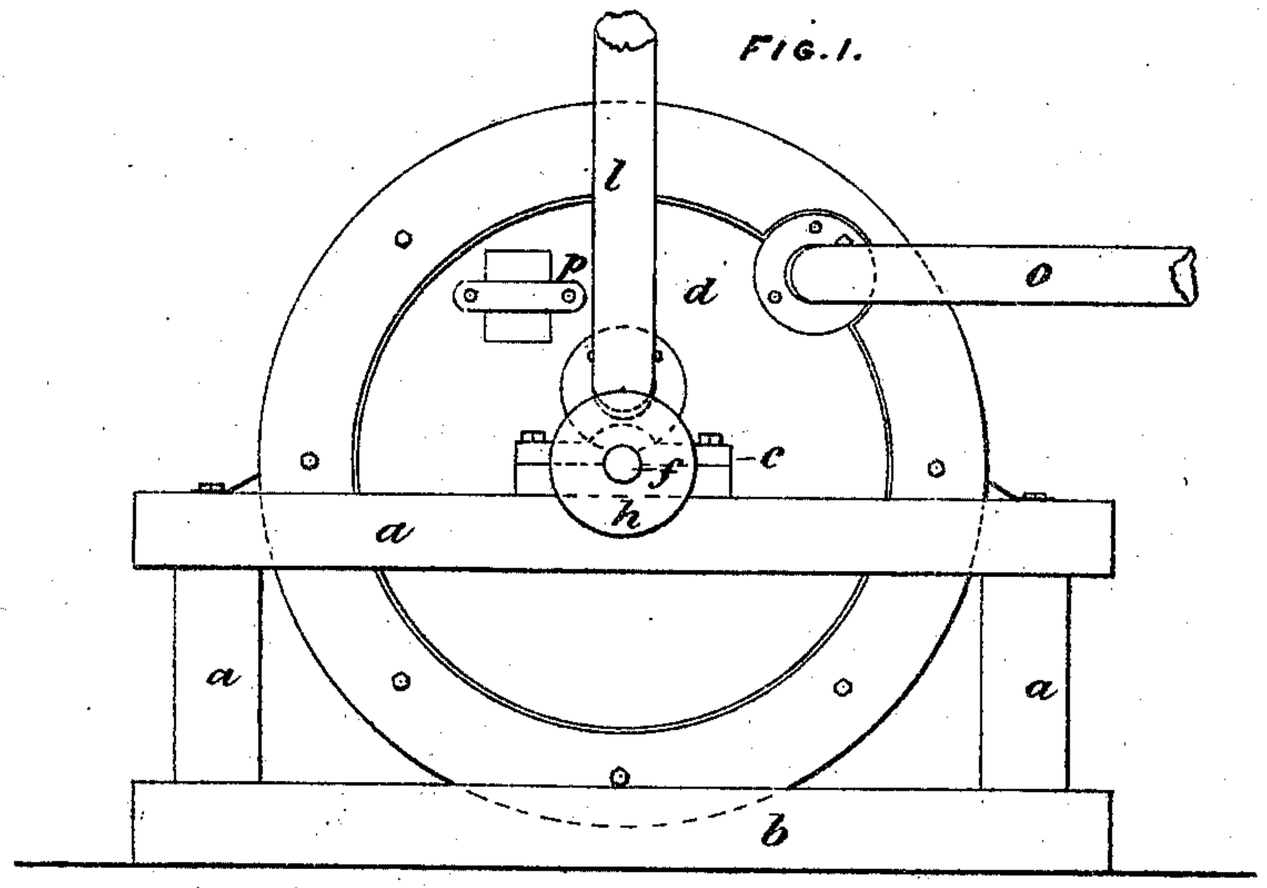
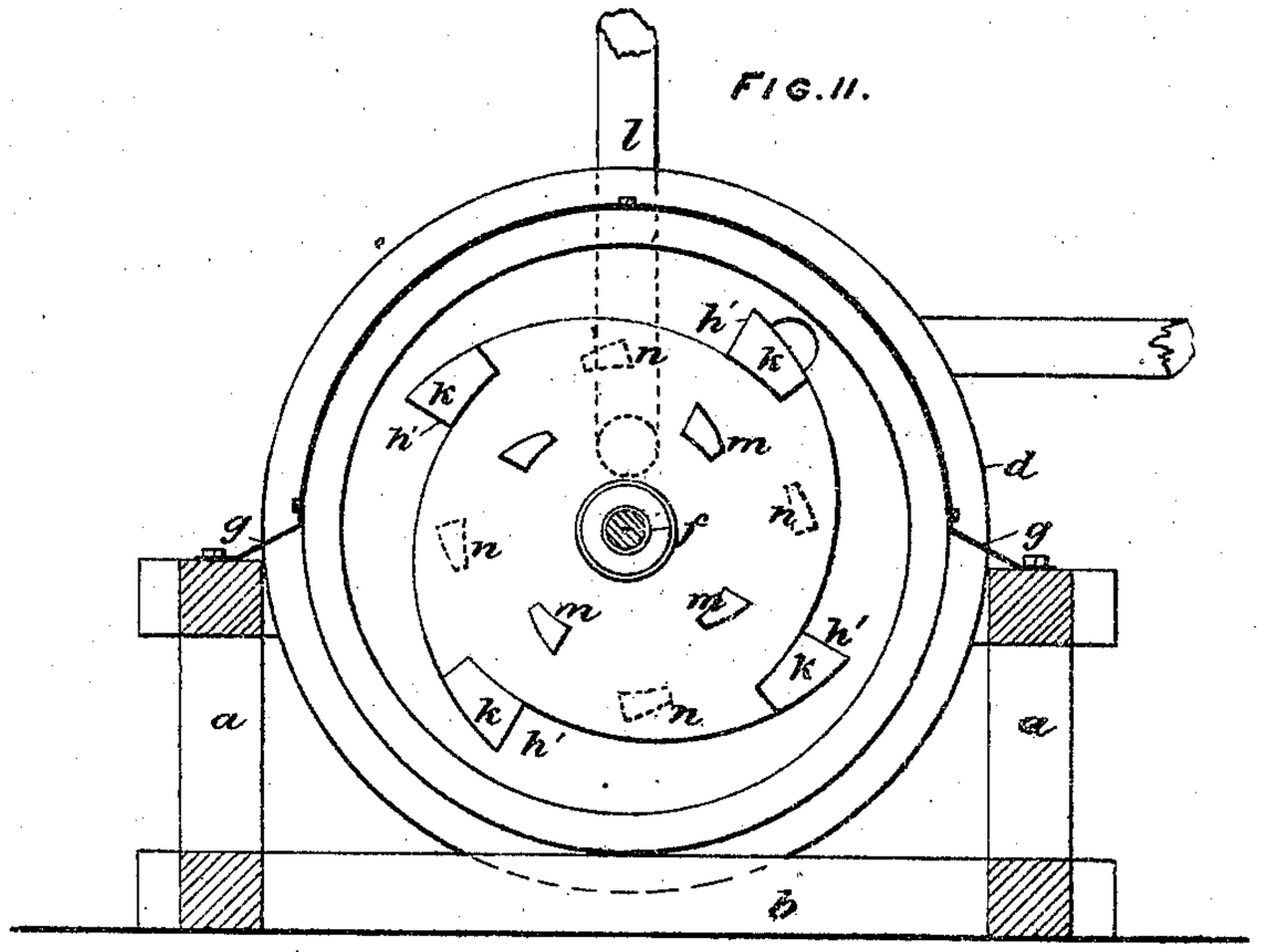


FIG. II.



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(3.) 2 Sheets--Sheet 2.

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FIG. IV.

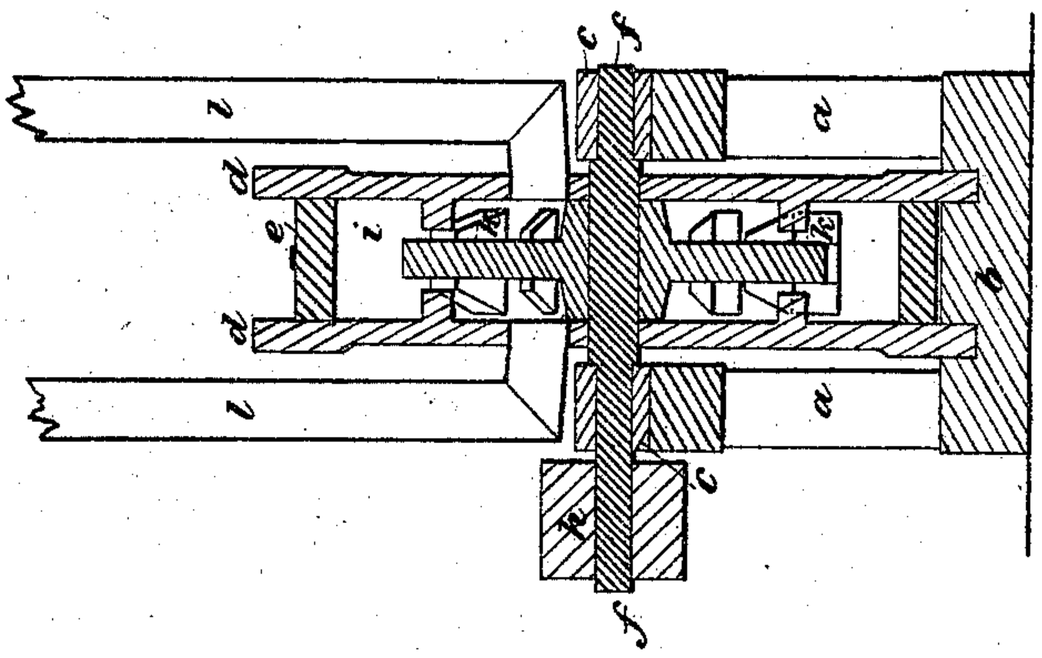


FIG. V.

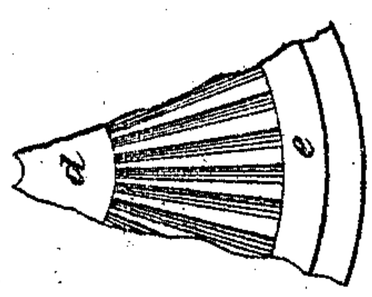
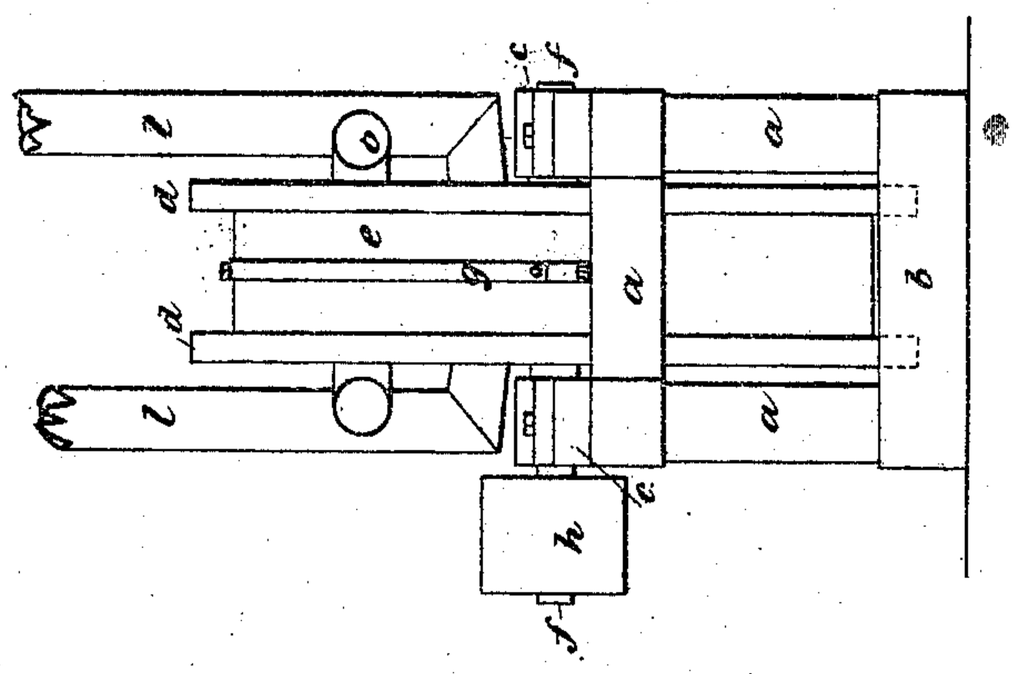


FIG. VI.

FIG. III.



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UNITED STATES PATENT OFFICE.

JEROME JOSIAH WEBSTER, OF MAGOG, CANADA.

IMPROVEMENT IN PULVERIZING AND GRINDING MACHINES.

Specification forming part of Letters Patent No. 122,748, dated January 16, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, JEROME JOSIAH WEBSTER, of the village of Magog, in the district of St. Francis, in the Province of Quebec, Canada, trader, have invented new and useful Improvements in Pulverizing and Grinding Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, where—

Figure I represents a side elevation of the machine. Fig. II represents a longitudinal vertical section of the machine. Fig. III represents an end elevation of the machine. Fig. IV represents a transverse section of the machine. Fig. V represents a detail. Fig. VI represents a detail.

This invention has reference to improvements on machines used for disintegrating or reducing to powder various substances, such as earths, stones, quartz, and other natural products, and manufactured articles requiring to be levigated for market, such as litharge, colors, and other chemical compounds, and reducing to flour any of the various grains, for the purpose of producing a simpler and cheaper machine than those at present employed, and at the same time one capable of doing the work equally well or in a superior manner.

The drawing hereunto annexed is drawn to a scale of about three-quarters of an inch to the foot; but I do not confine myself to this scale, as the dimensions of the machine will be varied to suit the work they are employed in.

Similar letters of reference indicate like parts in the different figures.

a is the frame-work, of any ordinary and suitable construction, of wood or iron, its only remarkable feature being stability. *b* is the bed on which the frame-work *a* is raised. On the upper rails of the frame-work are situated two plumber-blocks, *c*, of any ordinary construction, secured to or made in one with it. In the space existing between the two sides of the frame-work *a* a casing is situated, consisting of two disks, *d*, with a short cylinder, *e*, interposed between them. In the center of the disks a hole is bored for the shaft *f* to pass and revolve freely through. The edges of the cylinder *e* are made parallel, so that when they are bolted together the faces of the disks *d* may also be parallel. The whole casing is then placed concentrically with the center line of the two plumber-blocks *c*, and at right angles horizontally and vertically with it, equally distant from both plumber-blocks, with the bottom edges resting upon or bedded into the bed *c*, the whole being held in place by the strap *g*, secured to the frame by any suitable bolts. The cylinder *e* and disks *d* are secured together in the ordinary manner, as in steam-engines, or, if preferred, it may be made in one with one of the disks. The shaft *f* is extended to one end through the plumber-block, and on this extension is placed the driving-pulley or other suitable gear-wheel *h*. On the part of the shaft within the casing, or between the ends *d* of the cylinder, is placed and secured a wheel, *i*, of the configuration clearly shown in Figs. II and IV. The wheel is not a true circle, but on its periphery, composed of tangential arcs, with their ends terminated in superficies h^1 to act as hammers. These superficies are extended beyond the width of the thickness of the wheel *i* by attaching supplementary pieces K thereto; but I prefer to form them in one with the wheel; thus if the wheel be made of wrought-iron or steel the projections K may be "jumped" on; if of cast-iron, they can be molded in the sand and run in one piece at the time of casting the wheel. In the disks *d* openings are made for the introduction of the feed-pipes *l*, one in each, as shown in the drawing. They convey the material to be acted upon by the machine and deposit it upon the hub of the revolving wheel *i*. In addition to the supplementary pieces K above described others of a similar character may be added on the sides of the wheel *i;* these, if used, will be situated as shown at *m*, so that they pass round when revolving in a circle just without the opening of the pipes *l* through the disks. The faces of these *m*, as well as those *k*, are radial to the center of the shaft *f*. Again, if desired, on the inside of the disks *d* projections *n*, as indicated by dotted lines in Fig. 2, may be attached or made in one with them. These are of a similar character to those described as *k* and *m*, and are so situated that, as the wheel

i revolves, those marked *k* will revolve outside them, while those marked *m* revolve inside. In each case a suitable amount of clearance must be allowed. The faces of these projections will be set at an angle so that particles struck by the projections *m*, and striking against those of *n*, will diverge at such an angle as to be caught by the surfaces of *k*. In some cases I prefer to corrugate the inner surfaces of the disks by any suitable corrugations extending from about the circle described by the inner side of the supplementary pieces *m* to the cylinder *e*, as shown in Fig. V. These corrugations may have either of the two forms shown in Fig. VI, as for some materials the angles and straight sides will be found more effective, while for others the curved lines may answer best. *o* are the discharge-pipes. If desired, their number and size may be increased, and their position on the disks *d* situated higher or lower, as required. *p* is a door, by which an examination of the inside may be made without taking the machine apart.

The machine is operated as follows: The pulley *h* being caused to revolve by means of any suitable power and with the requisite velocity, and with it the shaft *f* and wheel *i*, the material to be pulverized or ground is then introduced down the pipes *l*, the action of the machine itself producing a strong current of air and assisting the material to enter into the casing formed by the cylinder *e* and disks *d;* here it meets with the hammers *h'* and *k*, where, by their action and by the attrition and abrasion of the masses or particles themselves with one another, they become reduced to powder, in which form the strong current of air caused by the revolution of the wheel, having no other means of escape than by the pipes *o*, carries with it the finely-reduced particles into any suitable chamber, where they are allowed to subside. The corrugations hereinbefore described, together with the projections *m* and *n*, all or any of them may be added or not to assist the action described, and may be used to great advantage of such material as grain that is to be reduced to flour; but I prefer, when hard substances, such as ores, quartz, stones, &c., are to be acted upon, to use only the surface *h'* and supplement *k*.

Having now described the construction and operation of my invention, what I claim, and wish to secure by Letters Patent, is as follows:

1. The combination of the disks *d*, cylinder *e*, and wheel *i*, provided with projections K, constructed as described, substantially as and for the purpose set forth.

2. In combination with the disks *d*, cylinder *e*, and wheel *i*, constructed as described, the projections *m n*, substantially as and for the purpose set forth.

Montreal, 17th day of October, A. D. 1871.

JEROME JOSIAH WEBSTER.

Witnesses:

CHARLES G. C. SIMPSON,

A. B. MUIR.

(3)