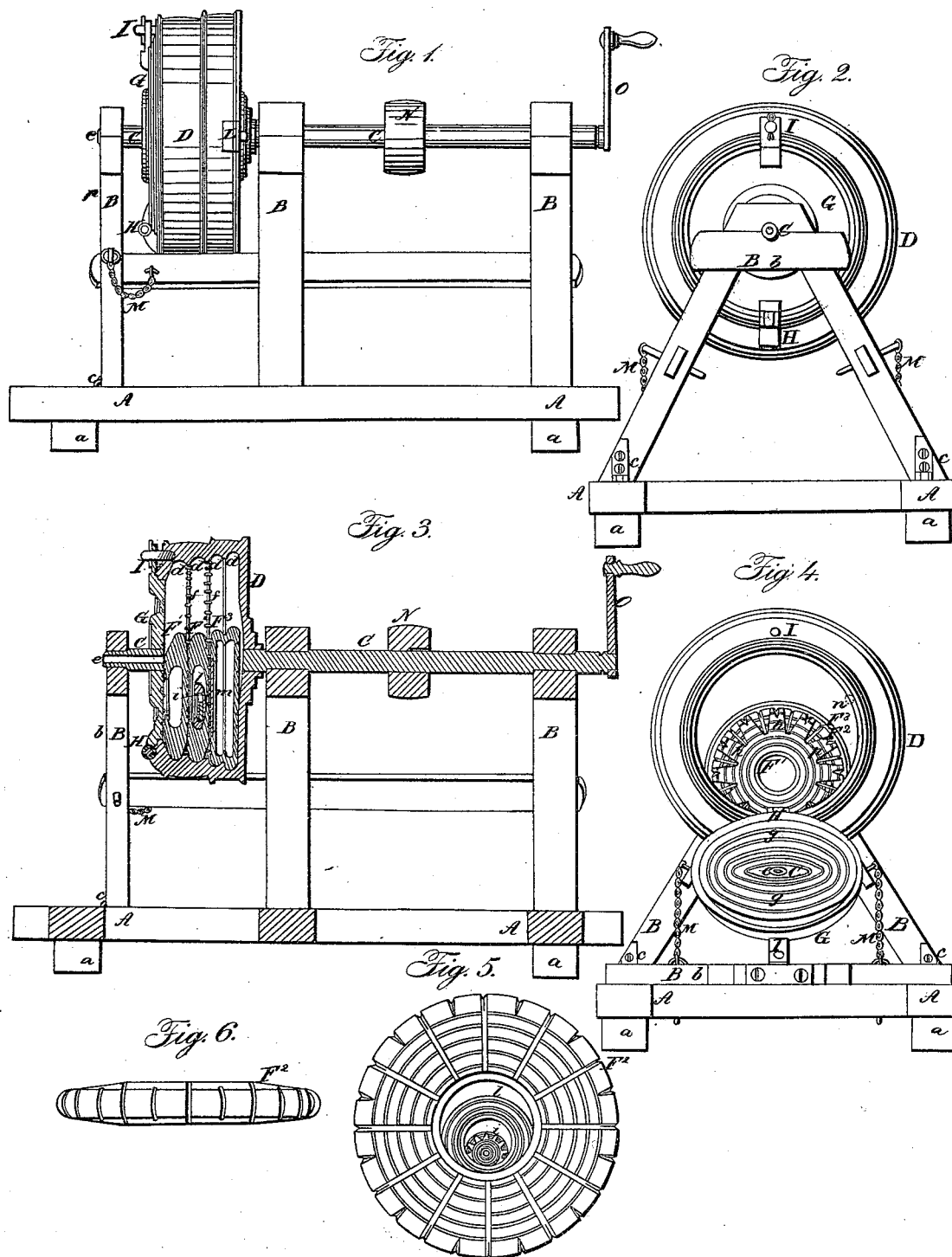


W. FROST.

Ore Mill.

No. 7,782.

Patented Nov. 19, 1850.



UNITED STATES PATENT OFFICE.

WM. FROST, OF NEW YORK, N. Y.

MILL FOR GRINDING AND CRUSHING.

Specification of Letters Patent No. 7,782, dated November 19, 1850.

To all whom it may concern:

Be it known that I, WILLIAM FROST, of New York, in the county of New York and State of New York, have invented a new and
5 useful Machine for Bruising, Crushing, Pounding, and Grinding Mineral, Animal, and Vegetable Substances; and I do hereby declare that the following is a full, clear, and exact description of the construction
10 and operation of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is an end elevation of the machine closed. Fig. 3
15 is a longitudinal section through the center. Fig. 4 is an end elevation of the machine open. Figs. 5 and 6 are side and edge views in detail on an enlarged scale of one of the crushers containing other crushers.

20 The same letters of reference indicate the same parts in each of the several figures.

The nature of my invention consists in the use of a round cylinder mounted on a shaft and driven by hand, steam or other power.
25 In grooves of the cylinder, inside, are crushers or rollers of a peculiar form containing if necessary similar crushers within themselves all of which when the cylinder revolves rotate by the friction against their
30 peripheries and are used for breaking, bruising, or grinding different substances put into the cylinder, the outlets and inlets for the material operated on, also the crushers and position of the machine being made accord-
35 ing to the particular purpose for which the machine is intended.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

40 A, A, is a stout wooden (or iron) frame having cross pieces and feet *a, a*.

B, B, B, are the bearing frames for carrying the shaft C, and cylinder D. The frames A, A, and B, B, B, united together, may be
45 so positioned as that the whole machine may be at an angle by raising either end, or that the shaft C, shall be horizontal as shown in the drawing, one of the bearing frames at *b*, may be fitted with hinges *c, c*, so as to swing
50 down when required to open the lid G, of cylinder D. The shaft C, may be made to run through the cylinder but for many purposes had better be in two parts to allow of larger and heavier crushers in the cylinder.

55 It may have a passage through one part as at *e*, or through both parts. The cylinder

D, revolving with the shaft C, to be made of metal or any other material, having any required number of internal grooves *d, d, d, d*, in which the crushers rest or work,
60 these grooves and the insides of the cylinder may have notches or grooves cut on their edges or faces as at *f, f*, and *g, g*, or in any other direction or place to assist in breaking up and preventing the substance being
65 ground from revolving as fast as the crushers or rollers.

The crushers *F¹, F², F³*, are made of metal or other material and either smooth on the face and edge or cut grooved or formed
70 in any suitable way according to the substance they have to operate on—for breaking up ores, &c., and quartz. *F¹*, is suitable and for hulling rice instead of the thick points
75 *h, h, h*, the projections may be of a round pin from the cylinder D, having holes in the interior into which the pin projection will strike, or the crushers may have cogs on its periphery similar to the cogs of a wheel, the
80 cylinder then having indentations for the cogs to drop into, the exact shape of these projections or grooves depending upon the different kind of substances to be crushed, grinding mustard, &c., requiring a smoother crusher than for breaking up quartz.

The machine when used as a pounder for extracting gold, &c., may have a stream of water running through the cylinder enter-
ing by the hollow space in the gudgeon *e*, at
90 *e*, or may be fed through the same with any liquid or other substance to be worked, and running out of a corresponding passage in, the other portion of the shaft or through
95 holes made in the back side or round the edge of the cylinder D.

The crushers may be made hollow and may contain one or more crushers within them as at *i*, and *i*, Figs. 3 and 5, for the purpose of grinding different kinds of substances simultaneously—a lid *m*, may be
100 fitted to each to prevent the different substances from mixing—or the crushers may be made hollow for the purpose of transport and may be filled when required with any convenient material to give them the re-
105 quired weight and the cylinder D, may be made in segments also for the facility of transport.

The machine may be made to work any number of crushers required.

110 Instead of a round crusher a solid segment may be used if desired or any other

similar shape and in order to give a greater force to the crusher in addition to its weight a pin may be inserted across the cylinder as at *n*, Fig. 4, or pins through the edge of the cylinder to act upon one or more of the crushers striking or lifting them when the cylinder revolves and causing them to fall back with great force on the material to be crushed or broken. The machine when raised at either end being placed in an inclined position, causes the crushers to grind more effectually on their face as well as their edge and may be so used where a flat grinding surface is preferred.

G, is a door or lid to cylinder having a hinge at *H*, and a fastener at *I*; this lid is used for feeding &c.; *L*, is a slide cover or delivery lid, of which there may be one or more—*M*, *M*, are pins and chains for securing the bearing frame at *b*, in its place when not required to be swung down.

N, is a driving pulley and *O*, is a handle to work the machine by when sufficiently small or light to do so.

The operation is as follows—The shaft *C*, and cylinder *D*, secured to it, being made to rotate by pulley *N*, or handle *O*, or in any other suitable way, motion is given to the crushers or rollers (within the cylinder), *F*¹, *F*², *F*³, *i* and *l*, which motion is sufficient to break or pound the different substances for which the machine is adapted grinding either against the internal edge or sides, back and front, of cylinder, and against the peripheries or sides of crushers which if made to jump by bar or pin *n*, Fig. 4, fall with great violence on the ma-

terial operated, the bar *n*, lifting the crusher as the cylinder revolves to a certain height and when released by its continued motion the crusher by its force of gravity descends. When required to feed the machine with substance to be ground &c. the pins *M*, *M*, are loosed from the outer bearing frame *B*, at *b*, which being lowered down the door or lid *G* may be opened by unfastening the catch at *I*, and the substance to be pounded then thrown into the cylinder or the inner crushers *i*, *l*, may be taken out and fed or have their contents removed if sufficiently ground. *L* is opened when required to let out the ground substances from the cylinder *D*; it slides back or may work on hinge. When used to grind paints &c. the machine may be fed through passages *e* of the shaft or gudgeon *C*.

What I claim as my improvement and desire to secure by Letters Patent is—

The use of the cylinder *D*, grooved and notched, or smooth being made to rotate, and having within it any number of crushers formed as described for the purpose of pounding, grinding, or missing any substance, the crushers either running single, or for the purpose of working different substances simultaneously one within another, the jumping bar, or pins at *N* in combination with the arrangement shown or any other arrangement substantially the same.

WILLIAM FROST.

In presence of—

JOHN W. PUPON,
PERKINS NICHOLS.