(No Model.)

A. E. GRIFFITHS.

PULVERIZING APPARATUS.

No. 276,394. Patented Apr. 24, 1883.

FIG. 1

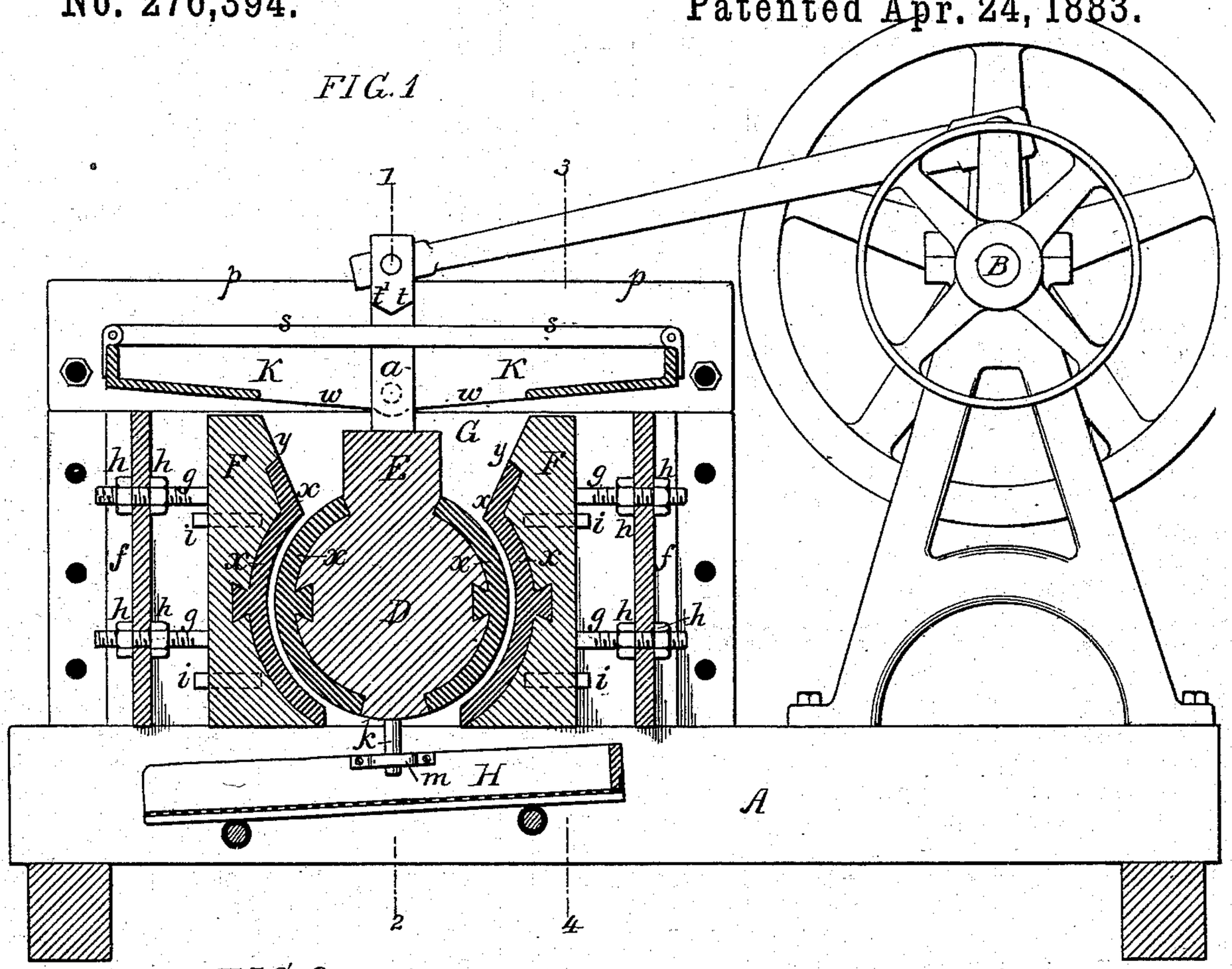


FIG. 2

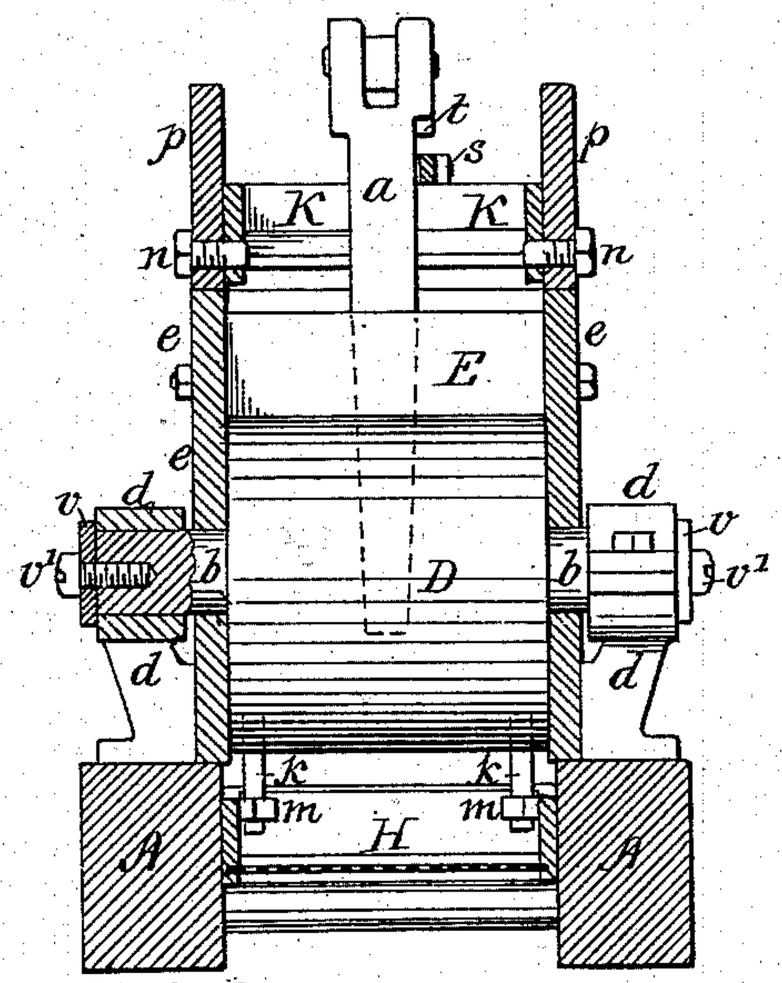
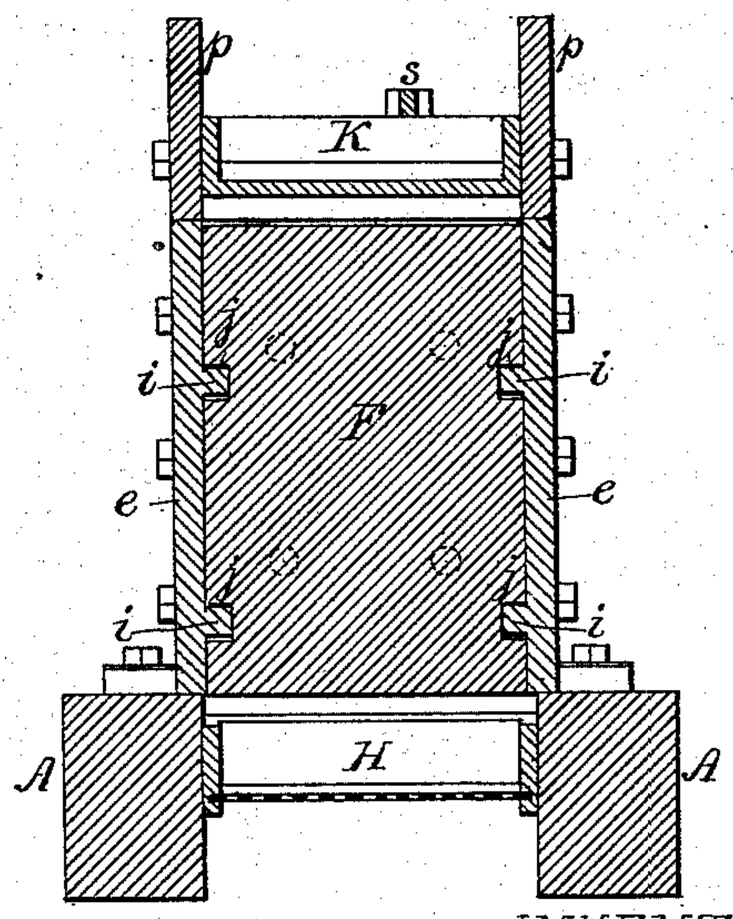


FIG. 3.



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UNITED STATES PATENT OFFICE.

AMOS E. GRIFFITHS, OF PHILADELPHIA, PENNSYLVANIA.

PULVERIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 276,394, dated April 24, 1883.

Application filed February 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, AMOS E. GRIFFITHS, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Pulverizing Apparatus, of which the following is a specification.

The object of my invention is to construct a compact, powerful, and efficient machine for crushing and pulverizing ore, rock, and pulverable substances generally; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of my improved crusher and pulverizer, the driving mechanism being shown in elevation; Fig. 2, a transverse section on the line 1 2, Fig. 1; and Fig. 3, a transverse section on the line 3 4, Fig. 1.

A is the base or foundation of the machine, at one end of which is the frame-work carrying the bearings for the driving-shaft B, a crank on the latter being connected by a suitable rod to an arm, *a*, on the vibrating cylinder D of the crusher, said cylinder being furnished with a projecting jaw, E, and having journals *b*, adapted to bearings *d* on the base. The jaw E is contained within and extends across a hopper, G, bounded partly by side plates, *e*, and partly by the upper inclined jaws of two concaves, F F, the lower portions of which are concentric with or slightly eccentric in respect to the cylinder B. The concaves F are contained within a box comprising the side plates, *e*, and end plates, *f*, and against the concaves F bear bolts *g*, the threaded ends of which project through the end plates, *f*, and are furnished with nuts *h*—one on each side of the plates—so that the concaves can be adjusted toward or from the cylinder D, parallelism of movement being insured by ribs *i* on the side plates engaging with slots *j* in the edges of the concaves F. The vibrating cylinder and the concaves F fit snugly between the side plates, *e e*, and in order to prevent the cylinder D from moving laterally, so as to bind against the side plates, *e*, the outer end of each of the journals *b* of the cylinder has a cap, *v*, secured to the journal by a bolt, *v'*, and bearing against the outside of the bearing *d*, so that any lateral movement of the cylinder independently of the bearings is rendered impossible.

Any material introduced into the hopper G must, as the cylinder D is vibrated, be crushed between the jaw E of the cylinder and the jaws *y* of the concaves F, the crushed particles, as soon as they are reduced to the proper size, finding their way into the spaces between the cylinder D and the concaves, where they are further reduced or pulverized by attrition, the particles being rubbed against each other, against the surfaces of the concaves, and against the surface of the cylinder D.

As the pulverized particles are discharged from between the cylinder and concaves they fall onto a sieve, H, the frame of which is mounted on rollers on the base A, a reciprocating motion being imparted to the sieve by means of pins *k* on the cylinder D engaging with lugs *m* on the sieve-frame. The sieve serves to separate from each other the coarse and fine particles, which are directed to appropriate receptacles.

Above the crushing-jaws is a feed-box, K, pivoted centrally by means of bolts *n* to plates *p*, and extending longitudinally across the top of this box is a bar, *s*.

On the arm *a* of the cylinder D are lugs *t t*, and as said arm is vibrated these lugs come into contact with the bar *s* and cause the tilting of the box K first in one direction and then in the other, so that the contents of the box are discharged through an opening, *w*, into the hopper G.

By means of the adjusting devices shown the spaces between the vibrating cylinder D and the concaves F can be varied as the desired fineness of the product may suggest.

To resist the wear to which the triturating-surfaces of the cylinder and concaves are subjected, I provide said cylinder and concaves with linings *x*, of steel or hardened iron, as shown in Fig. 1, the linings extending across the concaves and presenting hard surfaces, against which the material is crushed by the action of the projection or jaw E.

I claim as my invention—

1. The combination of the opposite connected side plates, *e*, and the concaves F, having inclined portions *y*, forming, with the said side plates, a hopper, G, with the cylinder D, jour-

naled to bearings, and having a projection, E, which extends across the hopper and forms, with the inclined portions of the concaves, crushing-jaws, all substantially as set forth.

2. The combination of the cylinder D and its projection E with the opposite connected side plates, *e e*, the concaves F, forming, with the side plates, a hopper, G, and the hard-metal linings *x*, portions of which extend into the hopper, substantially as specified.

3. The combination of the cylinder D, the opposite side plates, *e e*, and connecting-plates *f*, with the concaves F, adapted to guides on the said side plates, and with set-screws *g*, forming abutments for the concaves and made adjustable in the connecting-plates, all substantially as described.

4. The combination of the cylinder D and its projection E, the concaves F, and hopper G, with the centrally-pivoted feed-box K, having an opening, *w*, directly above the said hopper, and mechanism for vibrating the box, substantially as specified.

5. The combination of the pivoted feed-box having a bar, *s*, with the cylinder D, having an arm, *a*, provided with lugs *t t*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AMOS E. GRIFFITHS.

Witnesses:
HARRY DRURY,
HARRY SMITH.