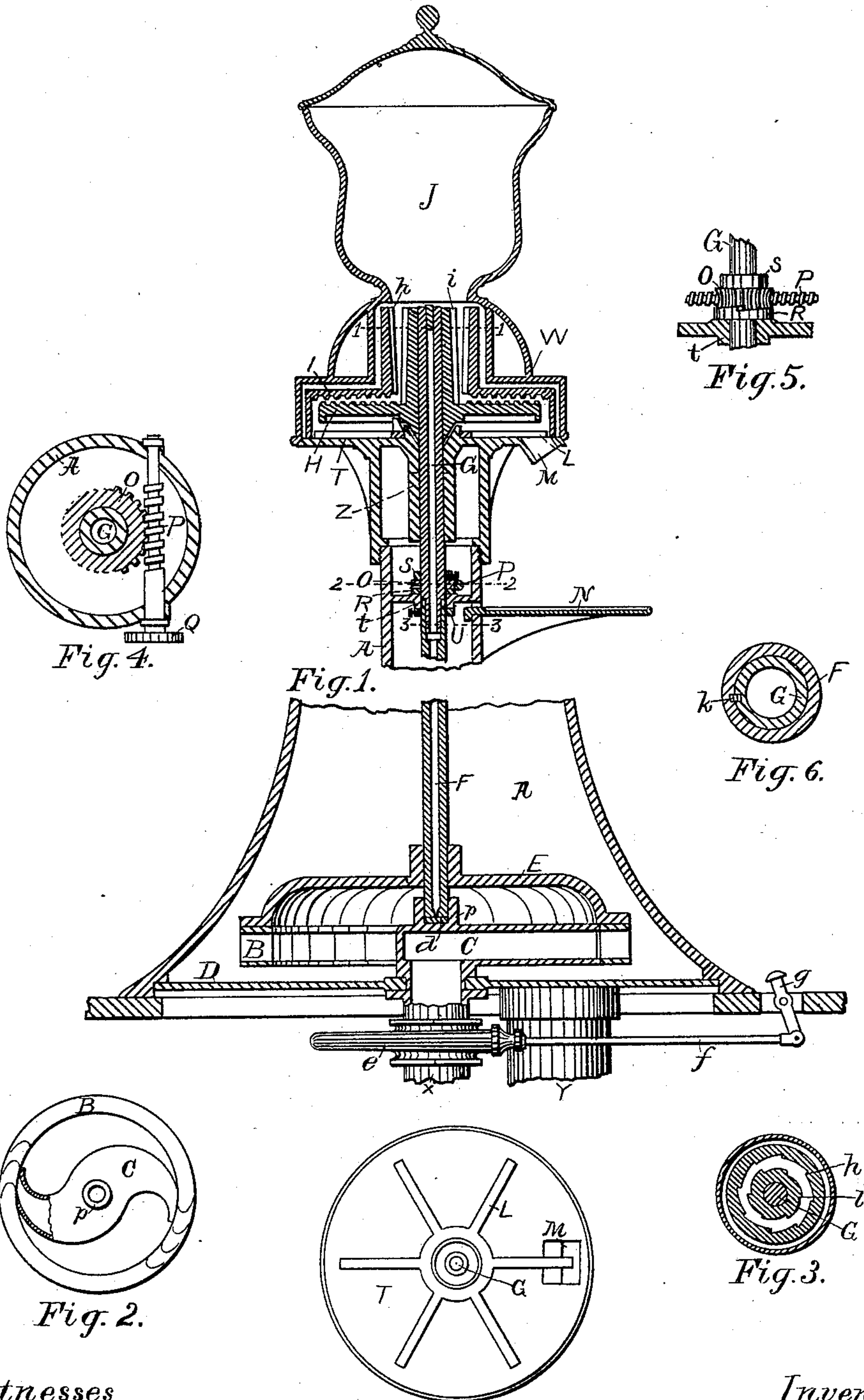


(No Model.)

G. W. BROWN.
GRINDING MACHINE.

No. 424,919.

Patented Apr. 1, 1890.



Witnesses

Wm. H. Loomay
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UNITED STATES PATENT OFFICE.

GEORGE W. BROWN, OF PORTLAND, MAINE, ASSIGNOR TO THE BELKNAP
WATER MOTOR COMPANY, OF SAME PLACE.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 424,919, dated April 1, 1890.

Application filed September 14, 1889. Serial No. 323,895. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BROWN, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented a new and useful Grinding-Machine, of which the following is a specification.

My invention relates to improvements in grinding-machines in which a rotary motor and grinding-mill are combined and inclosed in a single case; and the objects of my invention are to economize space occupied by machinery of mill and motor and to connect motor and mill in the simplest way. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of my machine. Fig. 2 is a sectional plan of part of the motor-wheel and partial section of the water-chute. Fig. 3 is a transverse section of top part of the mill, taken at 1 1, Fig. 1. Fig. 4 is a transverse section of mechanism for adjusting grinders of mill, taken at 2 2, Fig. 1. Fig. 5 is a side view of the same. Fig. 6 is a cross-section of the vertical shaft at 3 3, Fig. 1. Fig. 7 is a top view of carrier used to clear the mill of substance ground.

A case or frame consisting of a hollow cylindrical base or leg A, supporting a head W T, contains all the working machinery of the motor and mill.

In the leg A, which is flared sufficiently to provide a firm foot for the machine, is a rotary motor-wheel B, a water-chute C for admitting water or other force, and a bottom plate D, tightly closing the chamber of the leg near the foot. To the motor-wheel B is secured the vertical shaft F, having bearings in the case A at *p* and *t* and provided with collar U. Water is admitted through pipe *x*, which contains gate *e*, operated by lever *g* and rod *f*, and is expelled through pipe Y.

In the head W T is contained the stationary grinder I, revolving grinder H, carrier L, and shaft G, which is a continuation of the shaft F. The shaft G, to which grinder H is

firmly fixed, has upper bearing Z, and with its lower end penetrates the hollow shaft F, in which it is vertically movable, and to which it is secured by key or fetter K, as shown in Fig. 6. Grinders are adjusted by double cam O R, operated by worm P and knob Q, as shown in Fig. 4. The cam O R is operated between shaft-bearing *t* and a collar S on the shaft, and raises shaft G and grinder H, regulating distance between grinders as desired.

M is an outlet for substance ground, and N is a shelf for receiving a vessel.

L is a carrier or scraper having several arms and revolves on shaft G, scraping substance ground to outlet M.

The operation of the machine is as follows: Water is admitted under pressure through chute C to motor-wheel B and causes the shaft F and its extension G to revolve, carrying grinder H. Material to be ground is admitted to hopper J and expelled through outlet M.

I am aware that neither mill nor motor are novel, *per se*. I therefore do not claim novelty in either mill or motor in and of themselves, nor in the combination of the two broadly; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination, in a grinding-machine, of a rotary motor having horizontal bucket-bearing wheel operated by jets of water discharged under pressure upon its buckets and connected with and operating a vertical shaft, a mill having one grinder secured to case or frame of machine and one revolving grinder operated by a vertical shaft which is an extension of the motor-shaft, and a case or frame having a head provided with suitable bearings inclosing all the working parts of the mill supported by a hollow cylindrical leg, with flaring base containing and inclosing all the working parts of the motor, substantially as set forth and described.

2. The combination, in a grinding-machine, of a rotary motor contained and inclosed in a hollow cylindrical leg or base of machine,

a grinding-mill having stationary grinder I and revolving grinder H, operated on shaft G, which is an extension of the motor-shaft F, and a case or frame having head W T
5 provided with suitable bearings for shaft and grinders, which head contains and incloses all parts of the mill, and is supported by a hollow leg, with flaring base containing and inclosing the working parts of the motor, all substantially as set forth.

GEO. W. BROWN.

Witnesses:

WM. H. LOONEY,
EDWIN A. LEIGHTON.