(No Model.) 2 Sheets—Sheet 1.

H. HERZ & B. TERFLOTH.

PULVERIZING APPARATUS.

No. 421,571. Patented Feb. 18, 1890.

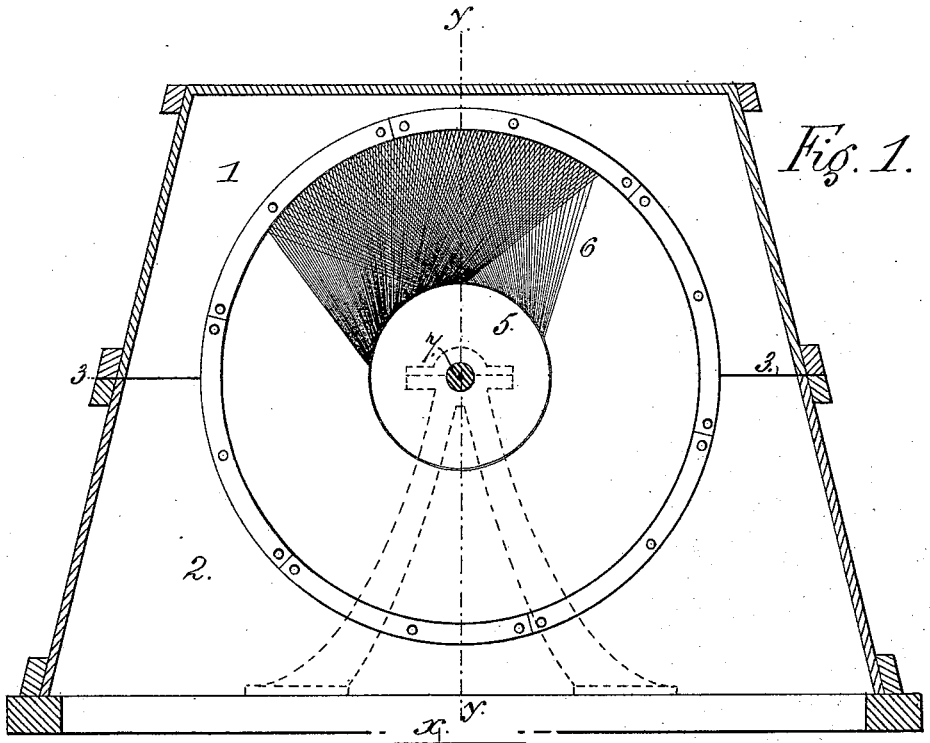

Fig. 1.

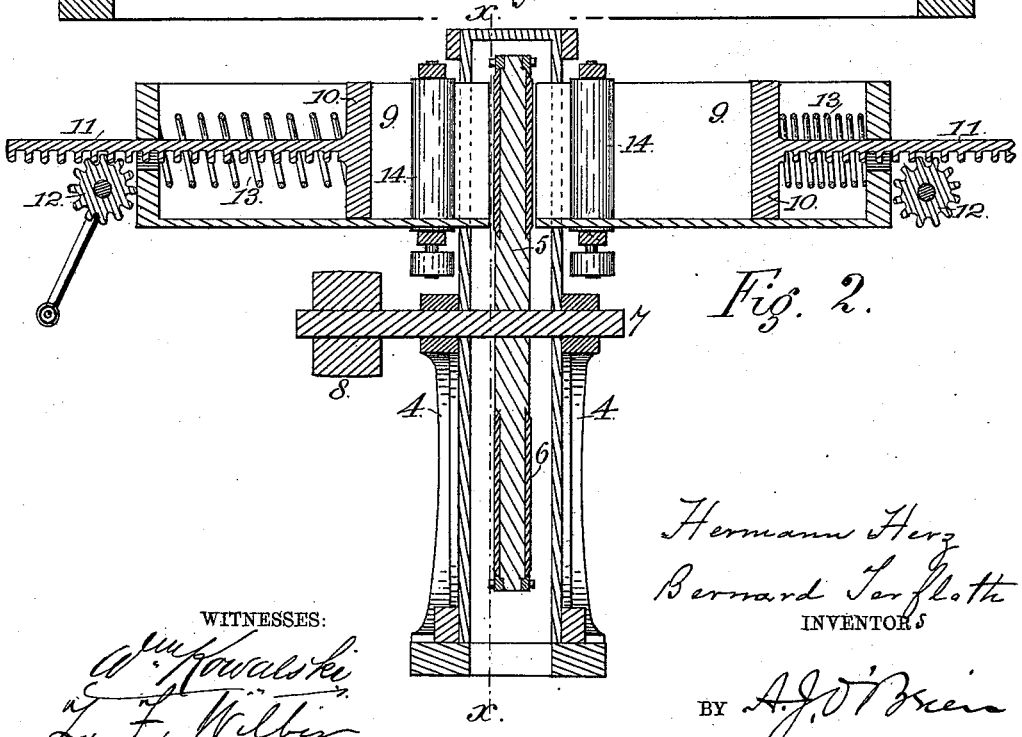

Fig. 2.

WITNESSES:

W. Jno. Kowalski

L. F. Wilbur

Hermann Herz

Bernard Terfloth

INVENTORS

BY A. J. O'Brien

their ATTORNEY

(No Model.) 2 Sheets—Sheet 2.

H. HERZ & B. TERFLOTH.

PULVERIZING APPARATUS.

No. 421,571. Patented Feb. 18, 1890.

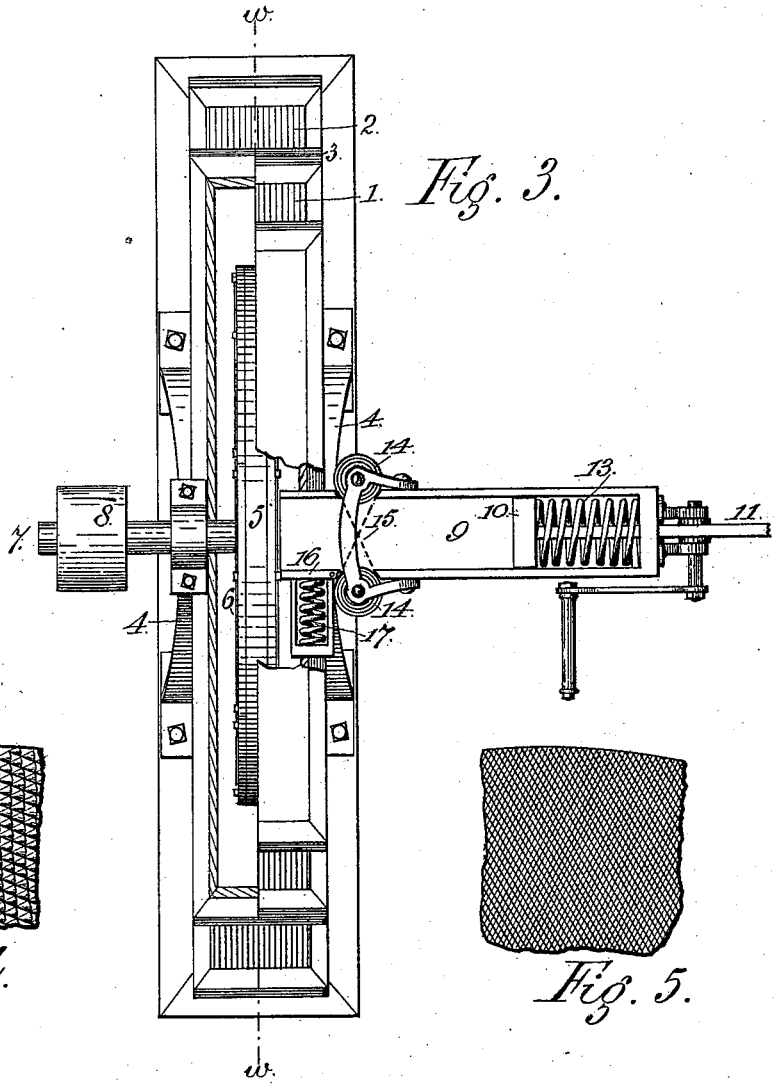

Fig. 3.

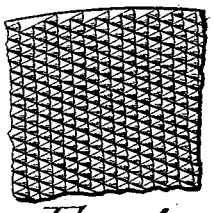

Fig. 4.

Fig. 5.

WITNESSES:

W. J. Kowalski

L. F. Wilber

Hermann Herz

Bernard Terfloth

INVENTORS

BY A. J. O'Brien

their ATTORNEY

UNITED STATES PATENT OFFICE.

HERMANN HERZ AND BERNARD TERFLOTH, OF DENVER, COLORADO, ASSIGNORS OF SEVEN-SIXTEENTHS TO EUGENE CROFF, OF SAME PLACE.

PULVERIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 421,571, dated February 18, 1890.

Application filed August 12, 1889. Serial No. 320,477. (No model.)

To all whom it may concern:

Be it known that we, HERMANN HERZ and BERNARD TERFLOTH, citizens of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Pulverizing Apparatus; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to a new and improved form and construction of pulverizing, disintegrating, or comminuting apparatus. It is well known that the complete comminution and reduction of certain silicious and aluminous compounds—such as various spars, mica, &c.—is attended with considerable difficulty, while such substances properly ground up are in great demand in various arts for lubricants, packings, bronzes, and glimmers in painting and printing, &c.

The object of our invention, therefore, is to furnish a reducing and pulverizing apparatus of simple compact construction, with comparatively few but durable parts, easily operated and controlled, reliable in operation, and adapted to reduce speedily and thoroughly the material fed thereinto, and fitted more especially for the reduction of mica and kindred materials, though equally useful for the reduction of many other materials; to which ends the invention consists in the features, combinations, and arrangements more particularly hereinafter described and claimed.

In the drawings is illustrated an embodiment of the invention, wherein—

Figure 1 is a vertical longitudinal section on the line *x x*, Fig. 2; Fig. 2, a vertical transverse section on the line *y y*, Fig. 1; Fig. 3, a top view, with the cover removed to the left of line *w w*, but in position to the right of said line, the central portion being broken away to more clearly show certain details of construction; Figs. 4 and 5, types of reducing or disintegrating surfaces which may be used.

In the figures, the reference-numerals 1 and 2 indicate the casing of the pulverizing apparatus, within which the latter is contained and by which it is supported, 1 indicating the upper half and 2 the lower half of the case, which are detachably connected together in any suitable manner along the divisional line 3.

3 3 mark any proper standards supporting journal boxes or bearings, in which is seated a shaft 7 for the wheel 5, the manner of communicating motion to such wheel being herein typically represented by the band or pulley wheel 8. Upon the face or faces of this wheel 5 are secured disintegrating or reducing surfaces 6, against which the material to be reduced is fed or pushed. As herein shown, both faces of the wheel carry such surfaces, making it, in effect, a duplex reducer; but it is evident, however, that the mode and principle of operation would be the same if only one face of the wheel were provided with such disintegrating and reducing surfaces. Such surfaces, preferably, are made in sections and fastened to the body of the wheel by nuts or screws, or in any suitable way permitting their ready securement thereto or detachment therefrom, that when worn they may be recut and replaced, or be replaced by new abrading-surfaces. Such abrading and comminuting surfaces may be of any material adapted to cut the substances fed thereto, they being herein represented and typified by the rasped iron or steel surface shown in Fig. 4 and by the file-cut iron or steel surface shown in Fig. 5, and as partially covering the surface of wheel 5 in Fig. 1. It is evident that material pressed and fed against such surface or surfaces must be speedily reduced, and in most instances to an impalpable powder, especially if the wheel be revolved at a high or comparatively high speed and the cut of the surface be properly proportioned. For such feeding, provision as follows is made. Where both faces of the wheel are provided with abrasive or reducing surfaces, a feed trough or hopper 9 is provided for each side; but as they are identical in construction and operation one only will be

described and the singular number used as indicative of the construction of such number as may be used.

Reference-numeral 9 indicates a feed-box or hopper, preferably rectangular in shape, and attached to the upper part of the case. Seated to move and reciprocate therein is a head or follower 10, to which is secured or with which is formed a stem formed into a gear-rack 11, and with which rack meshes a gear or pinion 12, having a crank-handle or other suitable device by which it may be rotated. Around such stem is a coiled spring 13, tending to constantly push the head or follower 10 toward the wheel 5. In operation, by means of the crank and the pinion or gear 12, the follower or head 10 is withdrawn from the wheel and the material is fed or placed in the space in the trough or hopper between the head or follower and the wheel, whereupon such material is pressed forward against the wheel with a force equal to the resilient pressure of the spring 13. To aid in such feeding and pressing forward, and even increase it and forcibly press the material against the disintegrating-surfaces, rollers 14 are provided, one on either side of the hopper or feedway and projecting thereinto, they being connected by a crossed belt or cord 15, that they may rotate in opposite directions and feed material coming between them in the same direction. The conjoint action of the spring-actuated follower or head and these rollers is that any material placed or fed into a hopper or guideway 9 is surely and forcibly brought against the abrading or pulverizing surface of the wheel, by which it is reduced to a degree of fineness proportionate to the cut of such surface. It may happen, however, that the material fed into the guide-box or hopper 9 is not sufficient to fill it from side to side, the material not being then in compact form, while the best results are expected only when such material is in most compact form. To provide therefor a part 16 of the side of the guideway or hopper may be pivoted to swing inwardly of the hopper, a spring 17 being arranged to act thereagainst, the part 16 of one side of the hopper or guideway consequently compressing compactly the material against the other side or wall of the hopper or guideway. Thus provision is made for bringing the material under every condition forcibly, firmly, and compactly against the abrading-surfaces of the wheel, where it is speedily and certainly reduced to the degree of fineness commensurate with the fineness of the abrading-surfaces; also, preferably, inasmuch as the ends of the guideways or hoppers 9 should come quite closely to or fit quite snugly against the abrading-surfaces of the wheels, they should be made of some material which cannot cut or injure such surfaces, a soft brass or other soft metal being a very fit material therefor.

In case mica is the material acted on, after comminution the material should be mixed with water and passed into a water-settling tank, wherein any heavier impurities—grit, &c.—which might impair the usefulness of the mica for any of its commercial purposes, may settle, the pure pulverized mica being drawn off with the supernatant water, to be afterward saved.

Having thus described our invention, what we claim is—

1. In a pulverizer, the combination of a wheel 5, having abrading-surfaces, feed-boxes or hoppers 9, each having a head or follower, provided with a rack, gear, and spring, and the compressing-rollers 14, substantially as set forth.

2. In a pulverizer, the combination of a wheel 5, having abrading-surfaces 6, a feed-box 9 for each such surface, means attached to each box for feeding the material to such surface, feeding-rollers 14, and the compressing-wing 16, actuated by spring 17, substantially as set forth.

3. In a pulverizer, the combination of a wheel 5, having abrading-surfaces 6, feed-boxes 9, each having a follower or head 10, rack 11, gear 12, and spring 13, feeding-rollers 14, and compressing pieces or wings 16, acted on by springs 17, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

HERMANN HERZ.
BERNARD TERFLOTH.

Witnesses:
T. F. WILBER,
BRINTON GREGORY.