

C. H. LYON.
PULVERIZING MILL.
APPLICATION FILED MAR. 16, 1911.

1,010,062.

Patented Nov. 28, 1911.

3 SHEETS—SHEET 1.

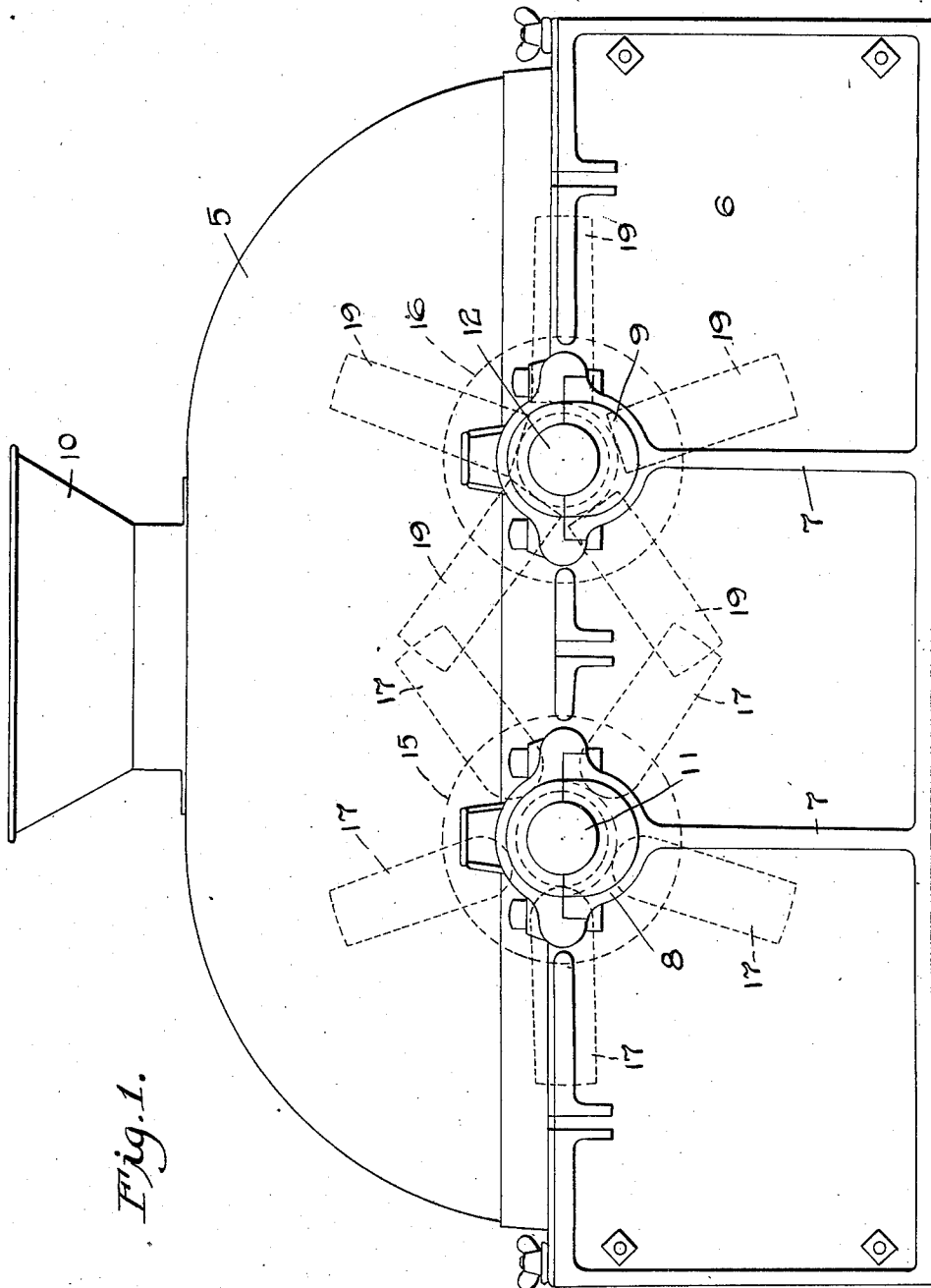


Fig. 1.

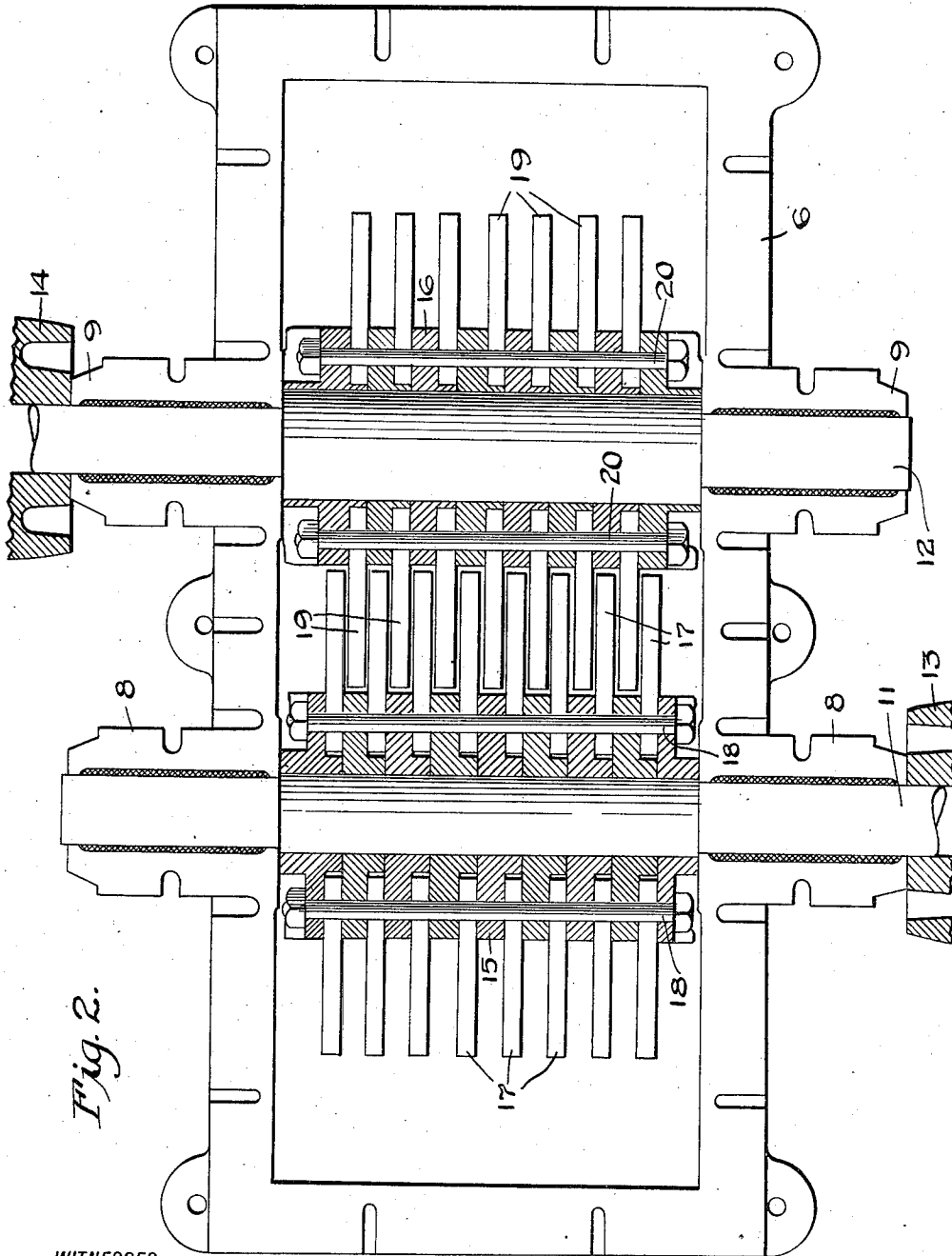
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Anthony W. Arcone

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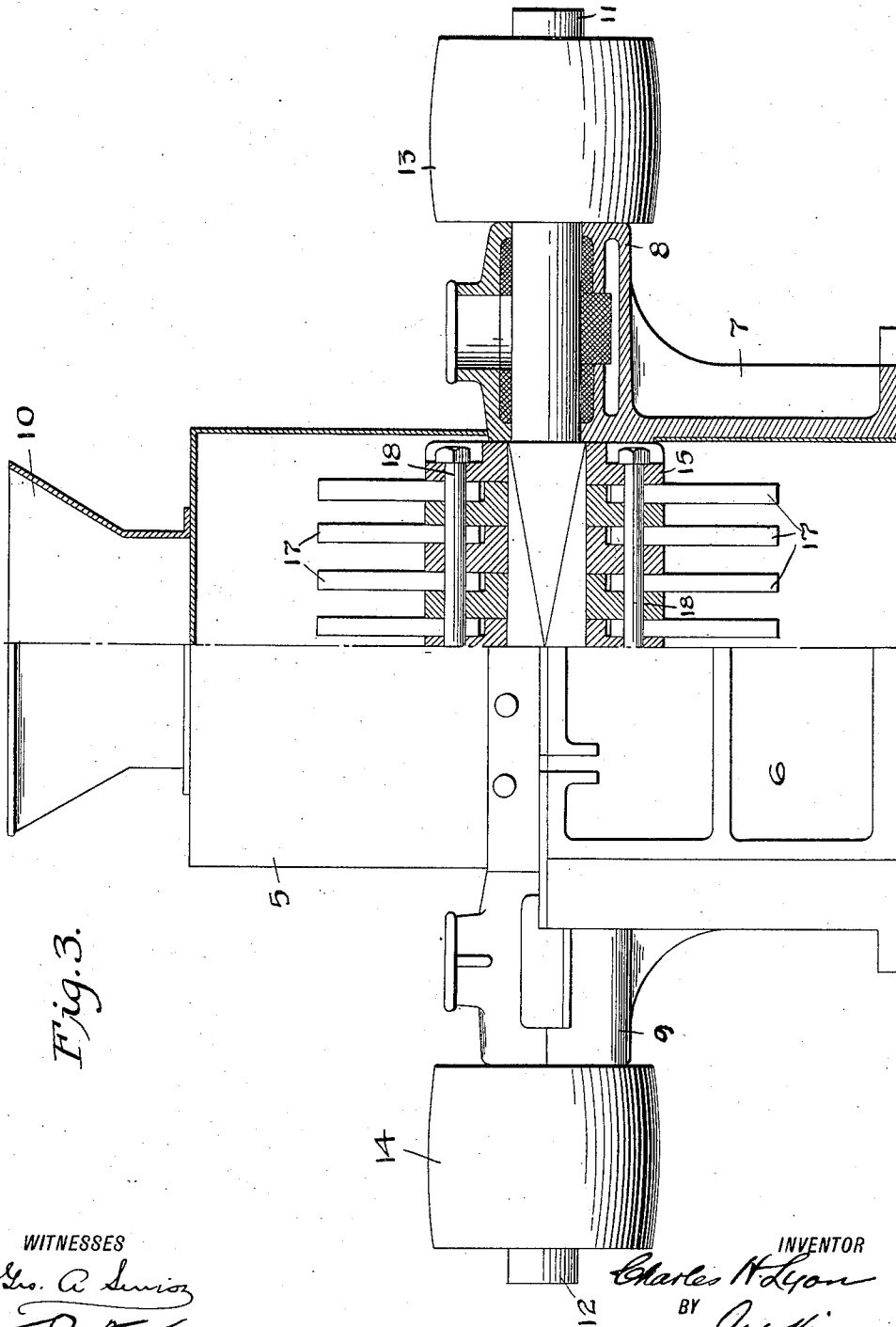


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES H. LYON, OF ELMHURST, NEW YORK.

PULVERIZING-MILL.

1,010,062.

Specification of Letters Patent.

Patented Nov. 28, 1911.

Application filed March 16, 1911. Serial No. 614,774.

To all whom it may concern:

Be it known that I, CHARLES H. LYON, a citizen of the United States, residing at Elmhurst, county of Queens, Long Island, State of New York, have invented certain new and useful Improvements in Pulverizing-Mills, of which the following is a specification.

My invention relates to mills for reducing or pulverizing bones, phosphates, hoofs, coal, fibers and similar materials and the object of the invention is to provide the reducing members with yielding means and have the members move at different rates of speed so that when unpulverizable material is encountered, the same may be automatically passed through the mill without danger of breakage or the stopping of the mill as will be more fully described in the following specification, set forth in the claims and illustrated in the drawings.

Pulverizing mills of this general type have been heretofore constructed with stationary parts but they are open to the objection that when unpulverizable materials such as iron scrap or similar materials are encountered, the stationary parts are liable to breakage; or where some provision is made for the release of the stationary parts through the breaking of some part of little value which can be easily replaced, the mill must be stopped for the removal of the interfering object. This requires the constant attention of an operator and as the materials reduced in mills of this type are usually full of various kinds of hard objects my device will save a great deal of time and labor. I also secure a large amount of working surface by my arrangement of the breaker arms and obviate the necessity of frequent adjustment or replacing of parts.

In reducing dissolved phosphates my device operates without puddling or causing them to become wet or sticky.

Figure 1 is a side elevation of the device. Fig. 2 is a horizontal sectional view. Fig. 3 is an end view partly in section.

In the drawings 5 is a casing preferably of sheet metal mounted upon the box 6. The latter has webs 7 supporting the journal boxes 8 and 9. On the upper side of the casing 5 is a hopper 10 and the ends of the casing are rounded to conform with the arc of the grinders. The journal boxes 8 and 9 form bearings for the shafts 11 and 12 having driving pulleys 13 and 14. The shaft 12

is adapted to rotate at about one seventh the speed of the shaft 11 and in the reverse direction thereto. On the fast moving shaft 11 is a series of recessed disks 15, rounded at their bottoms and adapted to receive the breaker arms 17 pivoted on the rods 18 which also hold the disks 15 together. On the slower moving shaft 12 is a series of recessed disks 16 squared at their bottoms and adapted to receive and hold rigidly the breaker arms 19, held in place by the rods 20 which also hold the disks 16 together.

In operating my device the material to be reduced is introduced into the hopper 10 and descends between the two shafts 11 and 12 revolving at their respective variant speeds. The breaker arms 17 on the fast shaft 11 overtake and pass between the arms 19 on the slow shaft 12 reducing all pulverizable material. If unpulverizable material is encountered in the mass being reduced, the fast arms 17 on striking same, yield backwardly, pivoting on the rod 18 and the slow moving arms 19 at the same time carry down and discharge the unpulverizable material without damage to any parts of the mill. The fast and slow breaker arms are in substantial engagement for nearly their entire exposed length when in action, thus providing considerable working surface. The arms begin to engage and shear or crush at a point above the level of the central axis of the shafts and cease reducing at a similar point below the level of the said central axis, where they disengage. The maximum engagement is on a line with the level of the central axis of the shafts and the total working area is included between the point where the arms begin to engage above the shafts and the point where they disengage below the shafts. The box 6 may be made of cast iron sections bolted together with suitable doors for the removal of the reduced material.

It is obvious that the details of the machine may be otherwise arranged and modified without departing from the essential features above described.

What I claim as new and desire to secure by Letters Patent is:

1. In a reducing machine, the combination of the following elements; a container, a plurality of shafts adapted to rotate in relatively reverse directions and at different relative speeds, means for rotating the said shafts in relatively reverse directions and at

relatively different speeds and a plurality of
breaker arms on the said shafts, the said
faster rotating breaker arms being adapted
to swing pivotally on one end and the said
5 slower rotating breaker arms being rigidly
attached at one end, the said faster rotating
breaker arms being adapted during rotation
to overtake, mesh with and pass the said
slower rotating breaker arms.

10 2. In a reducing machine, the combination
of the following elements; a box, a casing
mounted thereon, a hopper on the said cas-
ing, a plurality of webs in the said box with
bearings adapted to receive shafts, a plu-
15 rality of shafts mounted in said bearings
and having driving pulleys, pivot bars upon
said shafts, a plurality of driving means
adapted to rotate said shafts in relatively
reverse directions and at different relative

speeds, a plurality of disks mounted upon 20
said pivot bars on the said shafts and adapt-
ed to receive breaker arms, a plurality of
breaker arms mounted upon said pivot bars,
the said breaker arms on the faster rotating
shaft being adapted to swing pivotally and 25
the said breaker arms on the slower rotat-
ing shaft being rigidly attached to said
shaft, the breaker arms upon the faster ro-
tating shaft being adapted during rotation
to overtake, mesh with and pass the breaker 30
arms upon the slower rotating shaft.

In witness whereof, I have hereunto set
my hand this 28th day of February, 1911.

CHARLES H. LYON.

Witnesses:

ALLAN LAWSON RAMSAY,
EDWARD J. CONLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."