

H. A. THUNEMAN.
PULVERIZER.
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1,319,735.

Patented Oct. 28, 1919.
2 SHEETS—SHEET 1.

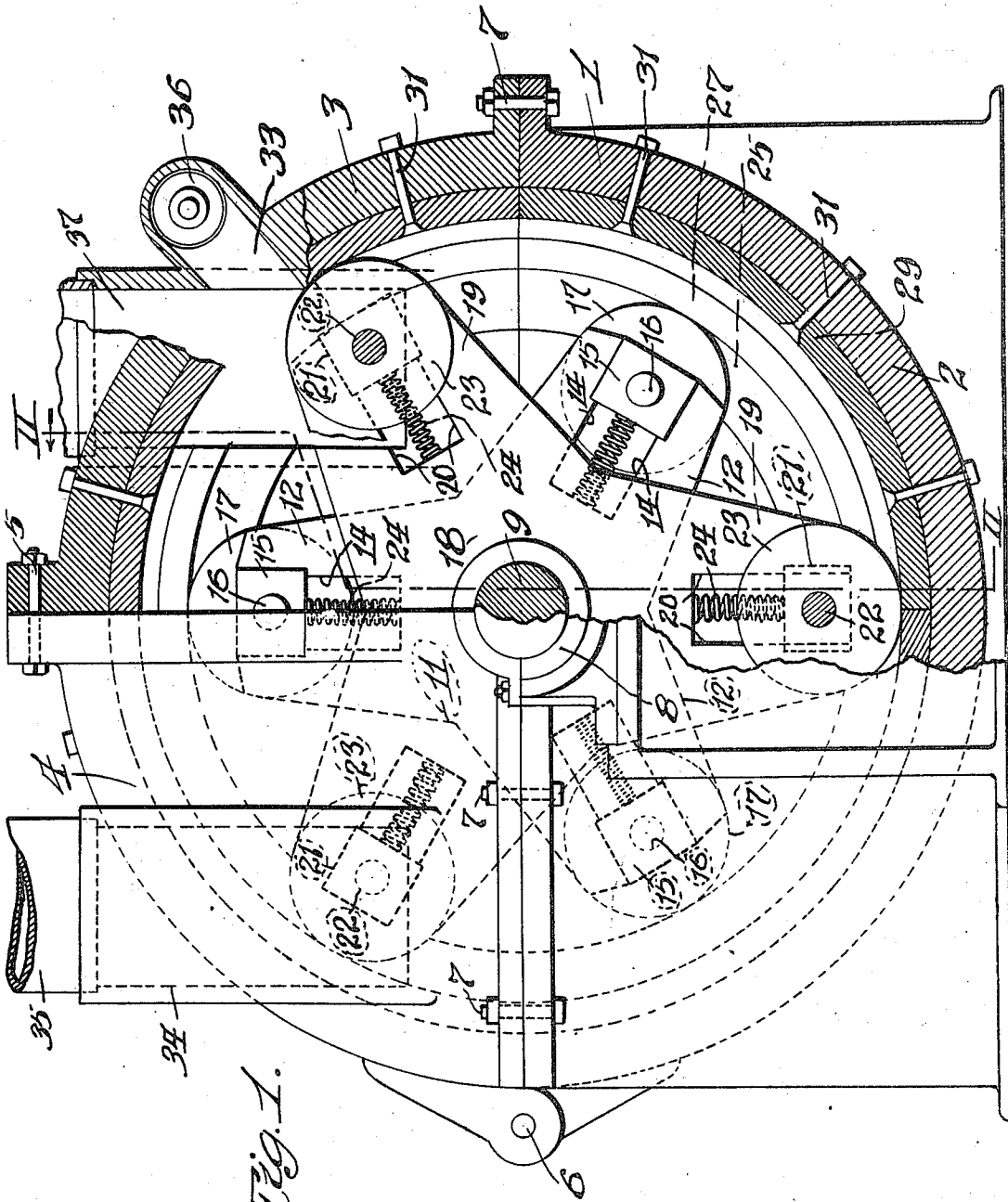


Fig. 1.

Attest:

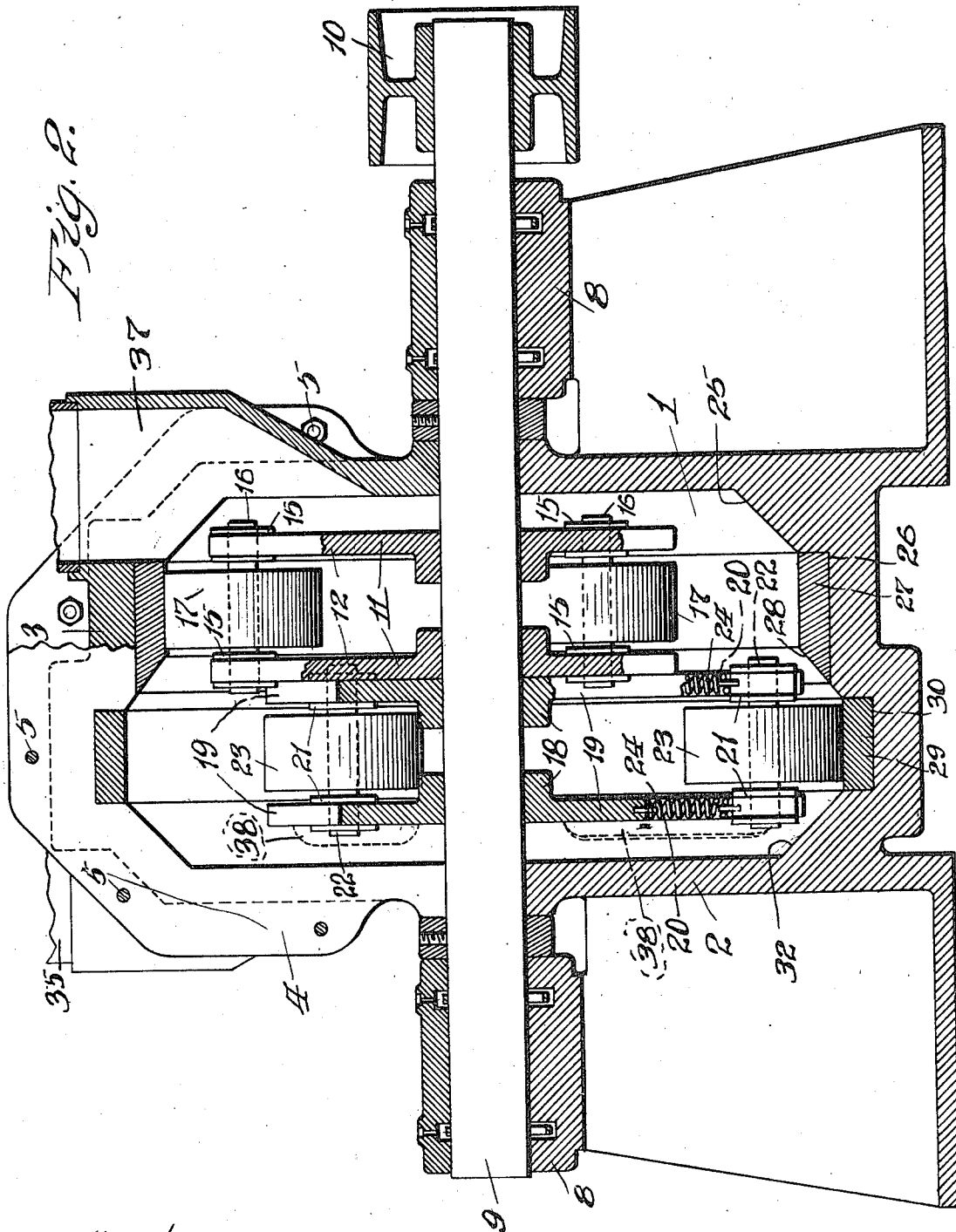
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UNITED STATES PATENT OFFICE.

HARRY A. THUNEMAN, OF ST. LOUIS, MISSOURI.

PULVERIZER.

1,319,735.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HARRY A. THUNEMAN, a citizen of the United States of America, and a resident of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Pulverizers, of which the following is a specification.

The main object of this invention is to provide an improved pulverizer with means whereby the intake for the material to be worked upon is formed on one side of the housing, and the outlet for the discharge of the material is formed on the opposite side of the housing so that the material while passing through the housing of the pulverizer will travel through the housing in a direction parallel with the axis of a plurality of differently diametered grinding surfaces.

Other and further objects will appear in the specification and be specifically pointed out in the appended claims, reference being had to the accompanying drawings exemplifying the invention, and in which,

Figure 1 is a side elevation partly in section of this improved pulverizer.

Fig. 2 is a vertical section taken approximately on the line II—II of Fig. 1.

With reference to the drawings, this improved pulverizer comprises a casing or housing 1, said housing consisting of a lower section 2 upon which is mounted quarter sections 3 and 4, said sections 3 and 4 being secured together by bolts 5, said section 4 being swingingly secured to the section 2 by the pin 6, said sections 3 and 4 being rigidly secured to the section 2 by the bolts 7.

When the sections 2, 3 and 4 are mounted together as described, bearings 8 are formed, in which is mounted a horizontally arranged shaft 9, one end of said shaft having a driving pulley 10 secured thereto. Rigidly secured to said shaft 9 and located in the housing 1 are a pair of roller supporting members 11, each member having a series of arms 12 formed thereon, each arm being provided with a pair of guideways 14, and slidably mounted in each of said guideways is a guiding block 15. Supported in each opposing pair of guiding blocks 15 is an axis 16, and mounted on each axis is a crushing roller 17.

Secured to the axis 9 adjacent the roller supporting members 11 and in the housing 1, are another pair of roller supporting members 18, each supporting member 18 compris-

ing a series of arms 19, and formed in each of said arms are a pair of guideways 20, and supported by each pair of guideways is a guiding block 21, each pair of opposing guiding blocks being for the support of a shaft 22, and mounted on each shaft is a crushing roller 23.

Engaging against each of the guiding blocks 15 and 21, and against their respective arms 12 and 18, is a coil spring 24. Formed in the housing 1 is an inclined annular face 25, and located adjacent said annular face is a ring seat 26, and located in said seat is a hardened steel ring 27, said ring having an inclined annular face 28, said inclined face 28 leading to another hardened steel ring 29 that is seated in the ring seat 30. These rings 27 and 29 are preferably constructed of sections, and are held in seating position by the bolts, such as 31, the ring 27 forming a circular pathway for the rollers 17, whereas the ring 29 forms a circular pathway for the rollers 23.

Formed in the housing 1 and leading from one side of the ring 29 is an inclined annular face 32. It is to be noted that the rings 27 and 29 are of different diameters, the ring 27 being of a smaller diameter than the ring 29, and attention is called to the rollers 17 which are set at a smaller radius from the shaft 9 than are the rollers 23.

The side of the housing in which the ring 27 and rollers 17 are located may be termed as the inlet side, whereas that part of the housing adjacent the ring 29 and rollers 23 may be called the outlet side.

Extending into the inlet side is an inlet passageway 33, and leading from the outlet side is an outlet passageway 34, said inlet passageway 33 being for the reception of the material from the conveyer 36 to be pulverized, such as slate, mineral ore, limestone and the like.

Leading from the outlet passageway 34 is a discharge pipe 35 which communicates with a separator, not shown.

In the operation of this improved pulverizer, when power is applied to the pulley 10, the shaft 9 is revolved, thereby carrying the arms 12 and 18 therewith, and the crushing rollers 17 and 23 on account of being in contact with the inner peripheries of their respective rings 27 and 29, will be caused to roll against said rings, the material to be crushed and pulverized is fed into the inlet passageway 33, and as it falls onto the

lower portion of the ring 27, it is engaged by the rollers 17 and crushed thereby. The material after being engaged by said rollers 17 will be forced off the ring 27, down the inclined face 28 thereof, and onto the ring 29, said ring being the pathway for the rollers 23, and as said rollers 23 are revolved, they will further crush the material to a state of pulverization, on account of the fact that the material is now trapped between the annular inclined faces 28 and 32, and can only be removed by the action of the vacuum produced in the discharge pipe 35, by the vacuum producing device, not shown, as the material when pulverized will be in the form of particles that are light enough to be drawn out of the pulverizer by suction.

In a device of this character it is to be noted that on account of the rollers 17 and 23 being mounted in slidably mounted boxes, that said rollers will tend to be thrown outwardly by the centrifugal force, thereby increasing the crushing weight against the material to be crushed as against the weight of the rollers themselves, the springs 24 being for the purpose of sustaining the rollers in their outward positions when the device is stopping or starting.

If desired any number of sets of radially arranged rollers can be used as regards the type of pulverizer mill desired in connection with specific materials to be worked on without departing from the spirit of this invention, the arrangement of the sets of rollers shown being set on different radii providing improved means for a more uniform crushing and pulverizing of materials than heretofore.

It is to be noted that the passageway 33, which leads from the screw conveyer 36 will deposit in the air inlet passageway 37, but said conveyer can be placed in any desired location relative to the receiving side of the housing 1. To further assist the vacuum producing device, not shown, relative to the pipe 35, fan blades such as shown in dotted

lines in Fig. 2, and designated by 38, can be mounted on the arms 19 of the outer roller support 18, said fan blades also serving to agitate and lift pulverized particles.

What I claim is:

1. A pulverizer comprising a housing, said housing being provided with an inlet passageway on one side thereof for feeding material therein, a horizontally arranged shaft located in said housing, a plurality of rollers arranged radially from said shaft and in sets, a circular trackway for one of said roller sets arranged adjacent said inlet passageway, a circular trackway larger in diameter than said other trackway for said other roller set, an annular inclined surface formed between said trackways leading from said smaller trackway to said larger trackway, said housing having a discharge passageway formed on the side opposite to said inlet passageway and adjacent said larger trackway.

2. A pulverizer comprising a housing, a horizontally arranged shaft located in said housing, a plurality of rollers arranged in sets around said shaft, a vertically arranged circular trackway for each of said roller sets, said trackways being of different diameters, said housing being provided with an inlet passageway located on one side thereof leading to the smaller trackway, and an outlet passageway located on the opposite side of said housing leading from the larger trackway, said shaft when revolved adapted to cause said rollers to centrifugally bear against their respective trackways, an annular inclined surface leading from said smaller trackway to said larger trackway, and a second annular inclined surface oppositely disposed from said other inclined surface leading from said larger trackway toward said outlet passageway.

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Witnesses:

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