

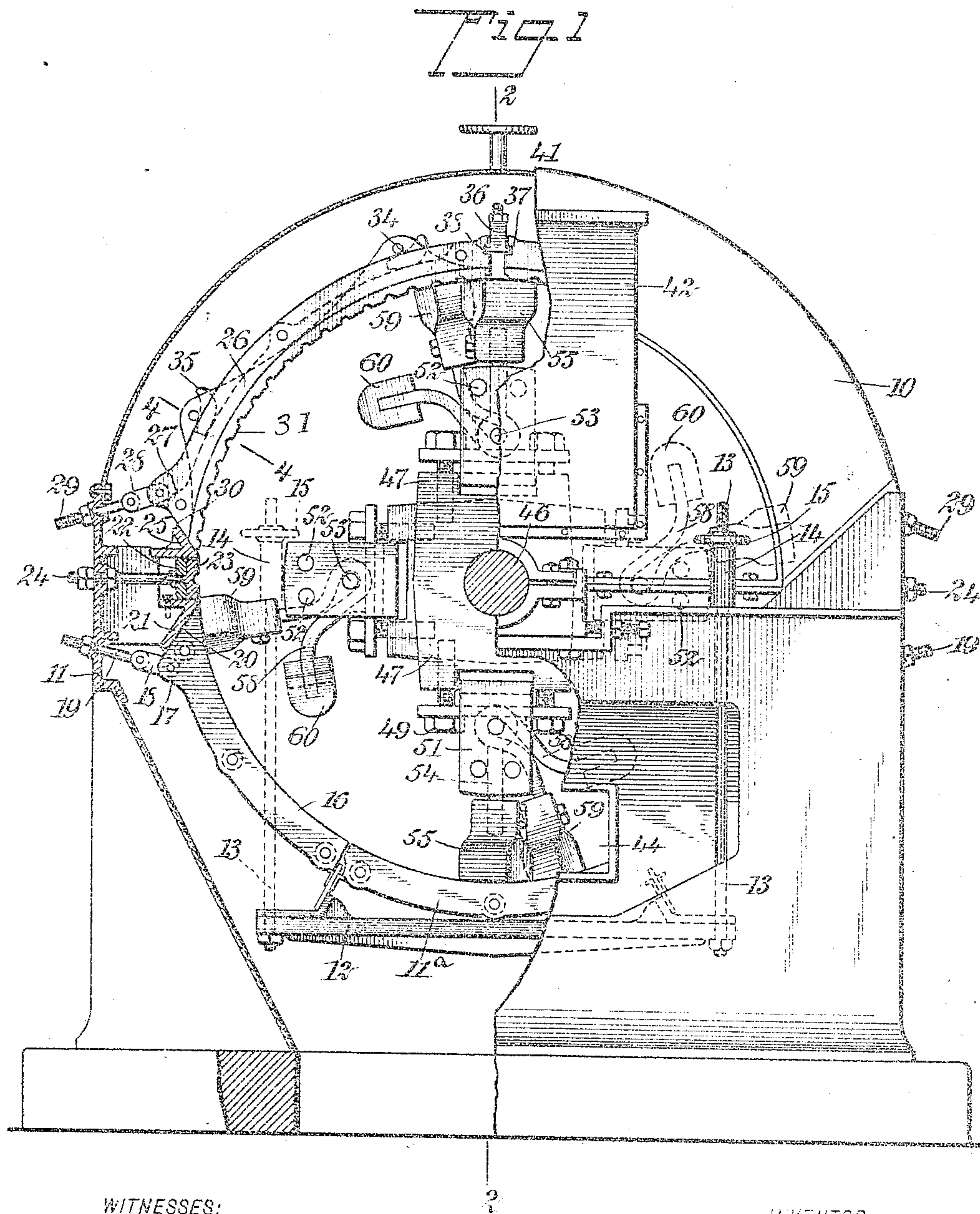
No. 848,213.

PATENTED MAR. 26, 1907.

N. SPURGIN.
PULVERIZER.

APPLICATION FILED NOV. 24, 1905.

3 SHEETS—SHEET 1.



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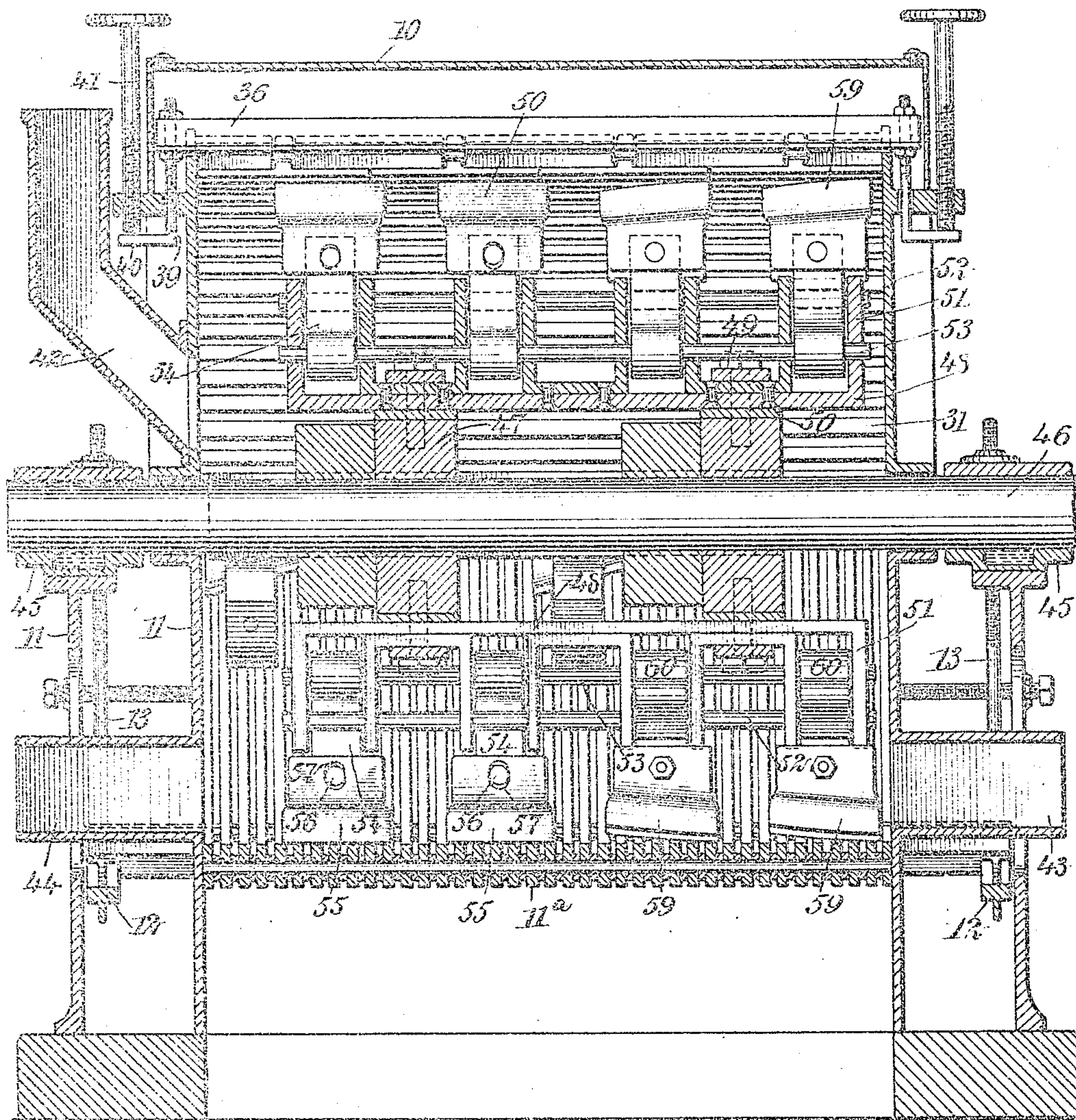
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3 SHEETS—SHEET 2.

Fig 2



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3 SHEETS—SHEET 3.

Fig. 5

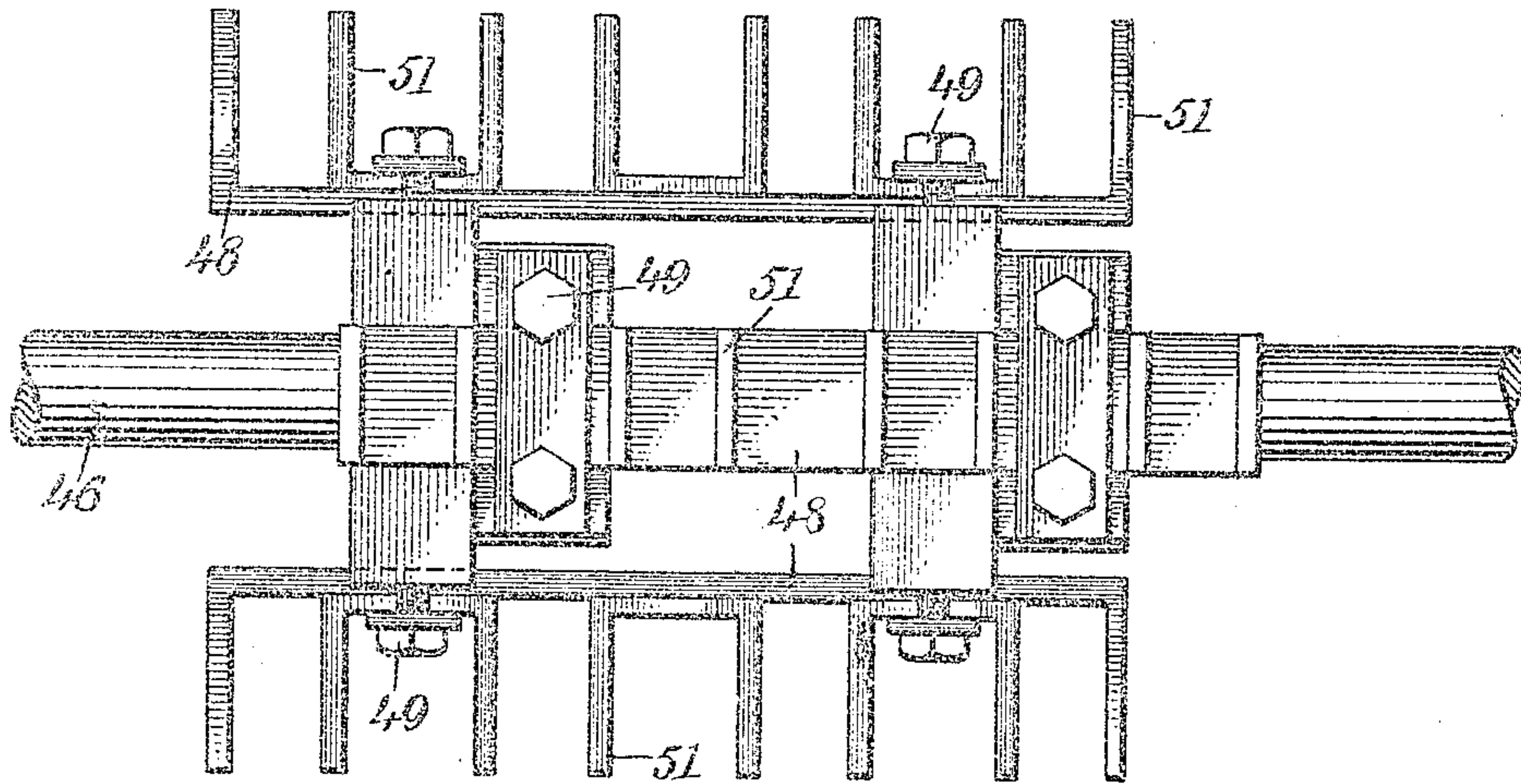
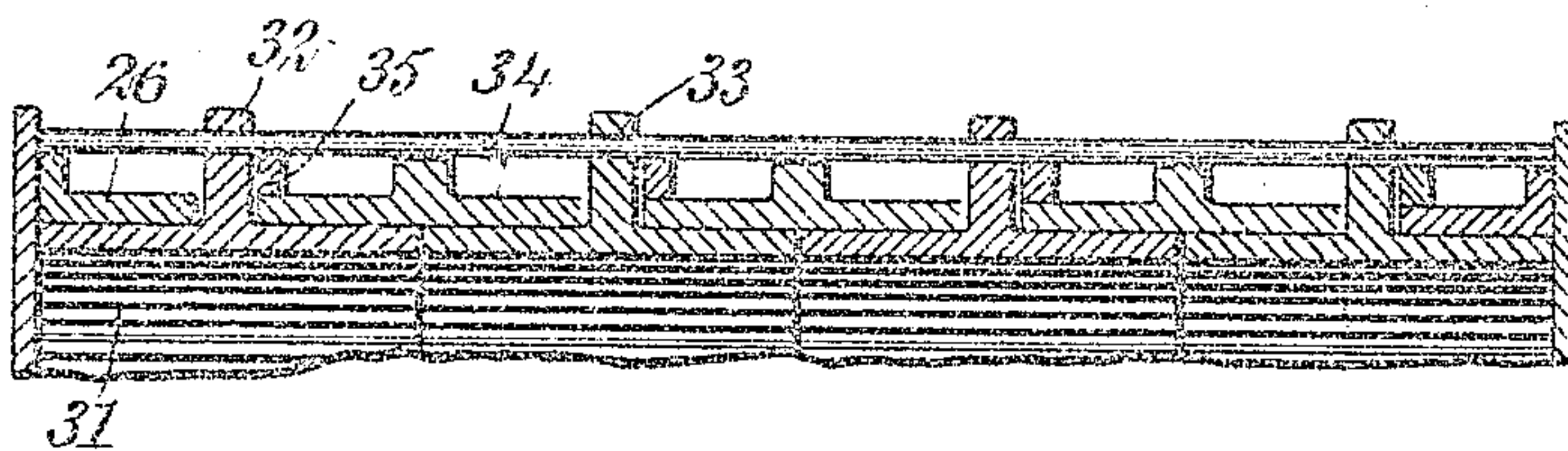


Fig. 4



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UNITED STATES PATENT OFFICE.

NICKOLAS SPURGIN, OF OTTAWA, ILLINOIS, ASSIGNOR OF ONE-HALF TO
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PULVERIZER.

No. 848,213.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed November 24, 1905. Serial No. 288,920.

To all whom it may concern:

Be it known that I, NICKOLAS SPURGIN, a citizen of the United States, and a resident of Ottawa, in the county of LaSalle and State of Illinois, have invented a new and Improved Pulverizer, of which the following is a full, clear, and exact description.

My invention relates to certain improvements in pulverizing machinery which are capable of general use in machinery of that character, but are especially adapted for use in disintegrating clay and similar substances.

The principal objects of the invention are to provide means whereby the material upon entering the machine can be acted upon by a stronger force than that applied after the material is partially pulverized and to provide means for adjusting the walls of the pulverizer-chamber in such a manner as to take up wear and yet furnish a substantially circular interior at all times. I accomplish the first object by certain improvements in the manner of supporting and manipulating the pulverizing-hammers and the second by certain improvements in the construction of the casing itself.

Further objects of the invention will appear below.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an end elevation of a pulverizer, showing one form of my improvements, parts being broken away to show interior construction in section. Fig. 2 is a sectional view on the line 2 2 of Fig. 1. Fig. 3 is a plan of a portion of the device employed to support the pulverizing-hammers, and Fig. 4 is a sectional view on the line 4 4 of Fig. 1.

I have shown an external casing 10, suitably supported by a frame 11 and adapted to inclose an interior casing composed of a plurality of parts adjustably mounted with respect to each other. This interior casing comprises a bottom section 11^a, mounted on a movable frame 12, which is provided with screws 13, operating in bearings 14 and each having a hand-wheel 15, by means of which the bottom section is adapted to be raised and lowered. Adjacent to the bottom section and fitting the ends thereof is a second section 16 on each side. This section is piv-

otally mounted with respect to the bottom section and is provided with an ear 17, to which a link 18 is pivotally connected. This link is connected with a bolt 19, passing through the frame 11 and adjustable with respect thereto. The upper end of the section 16 is provided with a beveled surface 20, which engages a correspondingly-beveled plate 21, mounted on the frame 11. The plate 21 is adapted to support a sliding frame 22, carrying a wearing-plate 23, composed of hard durable material.

The frame 22 is connected with a bolt 24, which is adjustably connected with the frame 11, whereby the wearing-plate 23 can be adjusted toward and from the center of the machine. Above the frame 22 is a plate 25, similar to the plate 21, but in reverse position. A section 26 is mounted above the plate 25 and is provided with an ear 27, connected with a link 28 and bolt 29 and with a beveled surface 30, similar to the corresponding features of the section 16. This section is provided with a lining 31 in the form of a series of plates constructed of hard and durable material and provided with a roughened surface or series of corrugations upon their interior. These plates are each provided with a projection 32, extending through the section 26. These projections are provided with perforations 33, through which passes a rod 34, held in position by wedges 35, as shown in Fig. 4. The sections 26 on the two sides of the casing closely approach each other at their upper ends and are supported by a bracket 36, which has projections 37 entering depressions 38 in the ends of the sections. This bracket is connected with a pair of screws 39, having feet 40, which engage hand-screws 41, mounted in lugs on the casing 11 to provide for adjustment.

The parts of the device so far described are constructed in this manner for the purpose of affording an adjustment of the interior diameter of the casing without materially changing the shape of the same. When it is desired to decrease the interior diameter, the section 11 is raised by the screws 13, while the sections 16 on each side are permitted to move inwardly at their upper ends by the screws 19. The beveled surfaces 20 slide up the lower inclined surfaces of the plates 21, and the sections 16 are therefore forced radially toward the center. The

frames 22 are moved inwardly a sufficient distance to cause the plates 23 to form a continuous surface with the sections 16. The plates 26 are manipulated in the same manner as the plates 16 by the operation of the bolts 29, and the bracket 36 can be lowered, if necessary, to aid in preserving the substantially cylindrical shape of the interior of the casing.

On the frame 11 are located a hopper 42 for receiving material and a discharge-outlet 43. I have also shown a hand-hole 44, through which the interior of the device can be reached.

In bearings 45, supported by the frame 11 or in any other convenient manner, is mounted a shaft 46, to which power is applied for operating the machine. This shaft is provided with a spider 47, on which are located a series of longitudinal bars 48. These bars are connected with the spider by means of bolts 49, and spacing-pieces 50 are preferably provided between them and the spider, so that by introducing spacing-pieces of different thicknesses the location of the longitudinal bars can be regulated with respect to the center of the shaft. On the longitudinal bars are located U-shaped brackets 51, the body of the bracket being secured to the bar. In the drawings I have shown some of these as integrally mounted on the bar and others as secured to it by rivets or the like. These brackets are provided with perforations through which rods 52 pass. I have shown two of these rods located the same distance from the center of the shaft and at a point between them, and nearer the shaft I have located a third rod 53. The third rod is designed for pivotally mounting the hammers which are to be employed for pulverizing material. I have shown these hammers mounted in two ways. At the entrance end of the machine, where the material is hard and has to be operated upon with considerable force, I have pivoted supports 54 directly on the bars 53, and these supports are located in such a position as to pass between the two bars 52. On the ends of these supports are mounted the hammers 55. It will be obvious that these hammers are compelled to strike a blow commensurate with the speed of rotation of the shaft. They are adjustably mounted with respect to the supports by means of studs 56, passing through slots 57 in the hammers. While these hammers are properly mounted for the purpose of the preliminary breaking of the material, it has been found that after this preliminary operation is started the lumps which are not to be passed through the machine, but are to be discharged from it in an unpulverized condition, should be handled with less force, and consequently I have provided a series of supports 58, which are in the

form of curved bars passing around the bars 53 and pivoted thereon. These supports are connected with hammers 59, located outside the two bars 52 and adapted to engage with the one of them which is in advance of the support. On the other arm of the support 58 is a weight 60. This construction permits the rapid rotation of the shaft to throw the hammers up into operative position by centrifugal force, the forward side of the support resting against the rear bar 52; but if any serious opposition is made the whole support, with its hammer and weight, will yield in such a manner as to permit a hard lump to pass along the machine without being handled as forcibly as it would be by the hammers 55.

By constructing a pulverizing-machine in accordance with the principles set forth above, whether in the form shown or not, the material is subjected to the full force of the hammers 55 when it first enters the machine; but such lumps as are not broken up by this operation are passed through the machine and are handled in the further operation thereof in a more gentle manner, so that they can be discharged without injury to the working parts, and those which are not intended to be broken up at all can be passed on without interfering with the pulverizing of the softer materials.

It will be noticed that the hammers 59 are beveled upon their working surfaces. This allows material to be forced between them and the coacting walls of the pulverizer in such a manner as to secure the necessary amount of pressure to properly work the materials.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A pulverizer comprising a sectional casing, composed of a vertically-movable bottom section, two side sections connected therewith, and means for engaging the upper ends of said side sections to move them toward the center of the casing when the bottom section is elevated.

2. A pulverizer comprising a casing made up of a plurality of sections, including a vertically-movable bottom section, a plurality of pivoted side sections on each side of the casing, said side sections having outwardly-beveled edges at their ends opposite the ends at which they are pivoted, and a cam for co-operating with said beveled edges whereby the upward movement of the bottom section will force the side sections inwardly.

3. A pulverizer comprising a casing having pivoted side sections provided with outwardly-beveled ends, a cam for co-operating with the beveled ends and an intermediate section between said beveled ends and adjustable toward and from the center of the

casing, and means for moving the pivoted ends of the sections toward and from the center of the casing.

4. A pulverizer comprising a casing having pivoted side sections provided with outwardly-beveled ends, an intermediate section between said beveled ends and adjustable toward and from the center of the casing, and a stationary frame having inclined surfaces engaging the inclined ends of the side sections and located above and below said intermediate section, and means for moving the pivoted ends of the sections toward and from the center of the casing.

5. A pulverizer comprising a casing having pivoted side sections provided with outwardly-beveled ends, a fixed cam for cooperating with the beveled ends, an intermediate section between said beveled ends and adjustable toward and from the center of the casing, one of said side sections having a lining provided with projections extending outwardly through the surface of the section, means for securing the lining to the section, and means for moving the pivoted ends of the sections toward and from the center of the casing.

6. A pulverizer comprising a casing having a movable section, a lining for said section comprising a plurality of sections, each having projections extending through the wall of said movable section, said projections being provided with perforations, rods passing through the perforations of corresponding projections on the sections, and wedges inserted between the rods and the outer wall of the movable section of the casing for securing the lining of said movable section.

7. A pulverizer, comprising a shaft, a bar connected therewith, said bar having brackets, each bracket being provided with three perforations, two at the same distance from the shaft and the other located nearer the shaft and between the first two perforations, rods extending through said perforations,

and pulverizing-hammers pivotally mounted on the rod extending through the third series of perforations.

8. A pulverizer, comprising a shaft, a bar connected therewith, said bar having brackets, each bracket being provided with three perforations, two at the same distance from the shaft and the other located nearer the shaft and between the first two perforations, rods extending through said perforations, and pulverizing-hammers pivotally mounted on the rod extending through the third series of perforations and bearing upon one of the rods extending through the other perforations.

9. A pulverizer, comprising a series of brackets mounted in alinement and each provided with three perforations, rods extending through the perforations in the several brackets, and two series of pulverizing-hammers pivotally mounted on one of said rods, certain of said hammers being confined between other two rods, and other hammers being free to move with respect to the other two rods.

10. A pulverizer comprising a shaft, a set of hammers rigidly mounted with respect thereto, and a set of hammers pivotally mounted with respect to the shaft.

11. A pulverizer comprising a rotatable shaft, hammers pivotally mounted with respect thereto and adapted to pulverize material when moved into operative position by the centrifugal force of the rotating shaft, and means for limiting the motion of said hammers in a forward direction, said hammers each being provided with a beveled operating-surface.

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

NICKOLAS SPURGIN.

Witnesses:

W. I. HARRIS,

B. B. HOLLAND.