

(No Model.)

8 Sheets—Sheet 1.

H. S. ALBRECHT.

MACHINE FOR DISINTEGRATING CLAY, ORES, &c.

No. 504,689.

Patented Sept. 5, 1893.

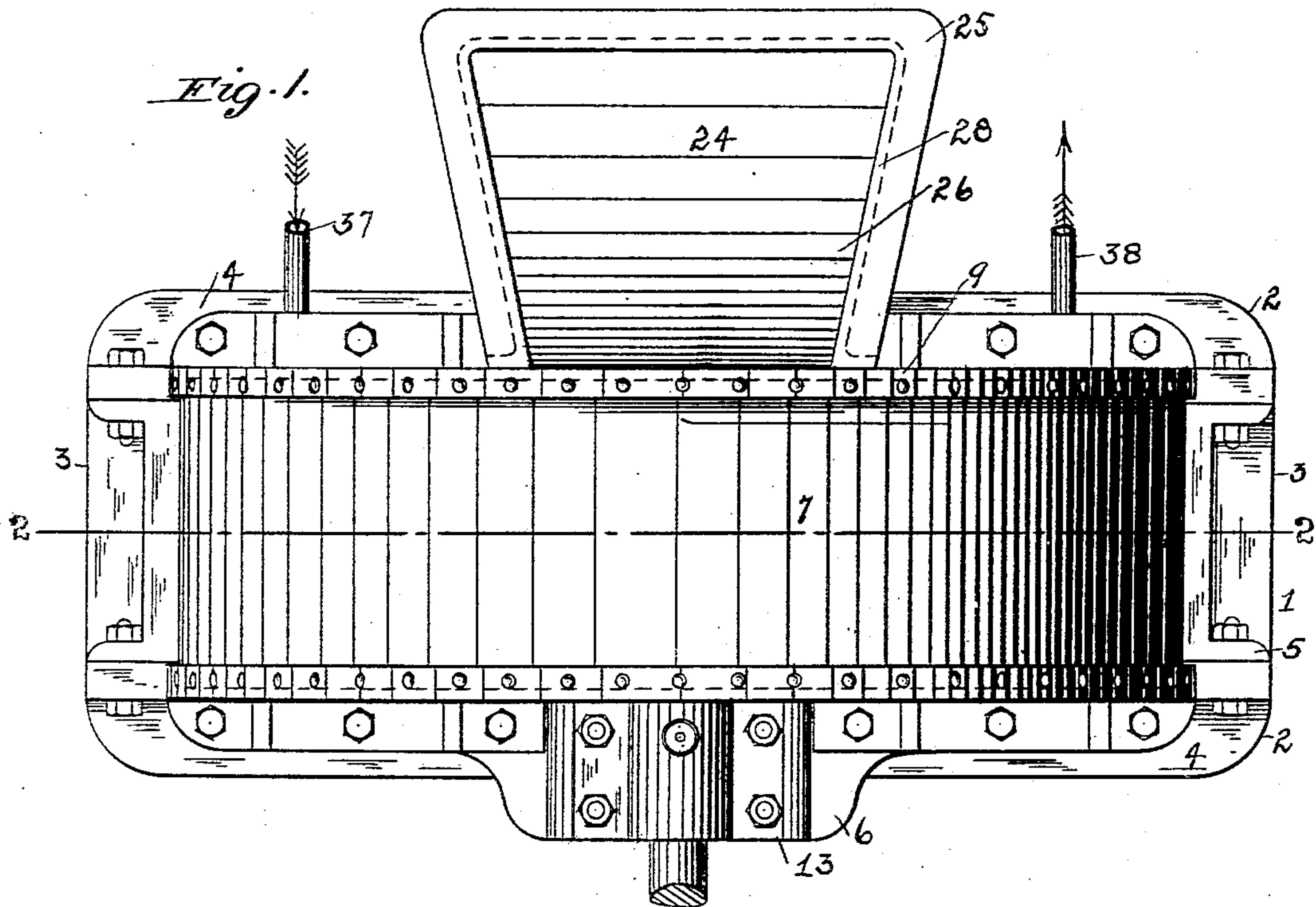
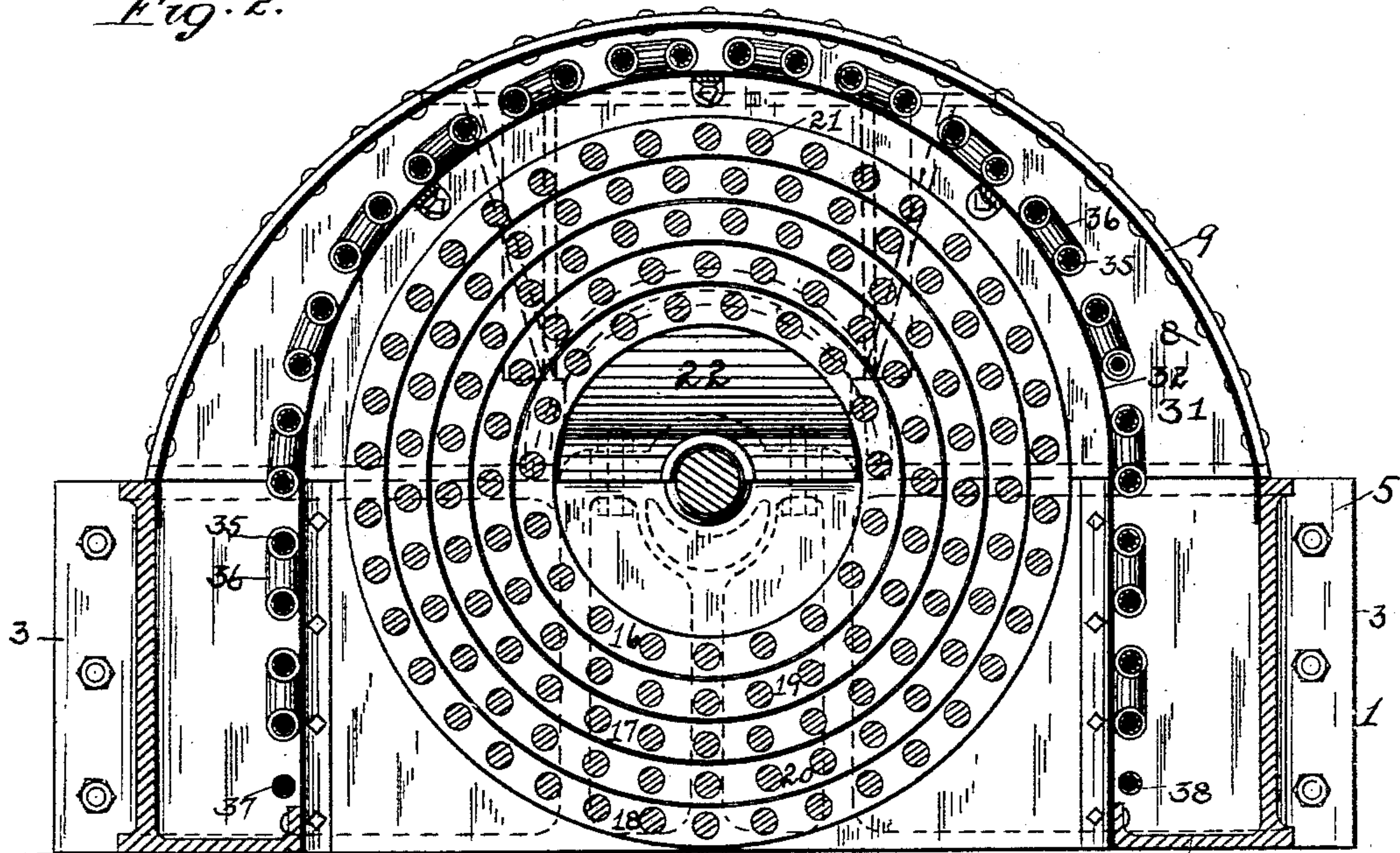


Fig. 2.



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(No Model.)

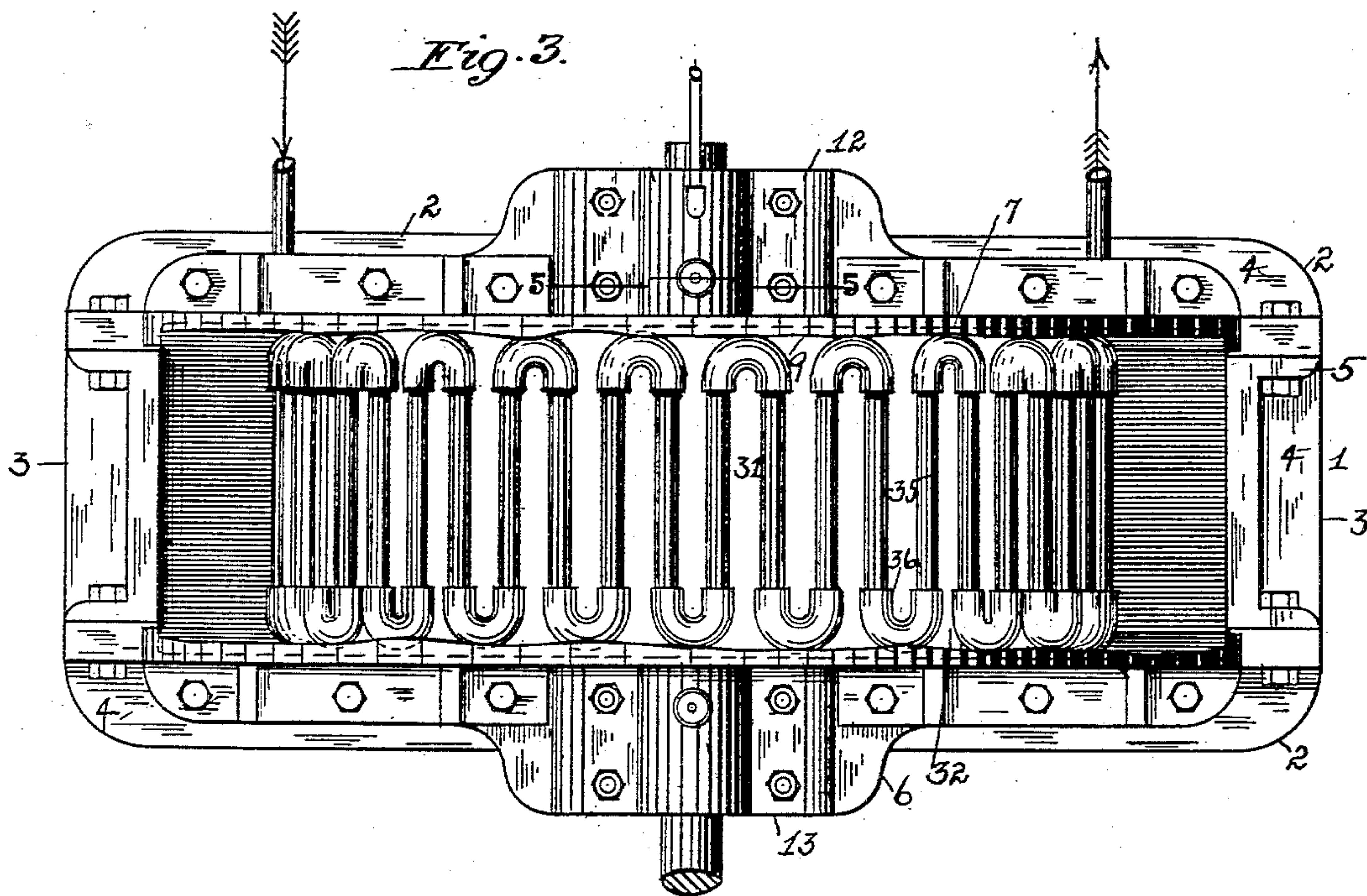
3 Sheets—Sheet 2.

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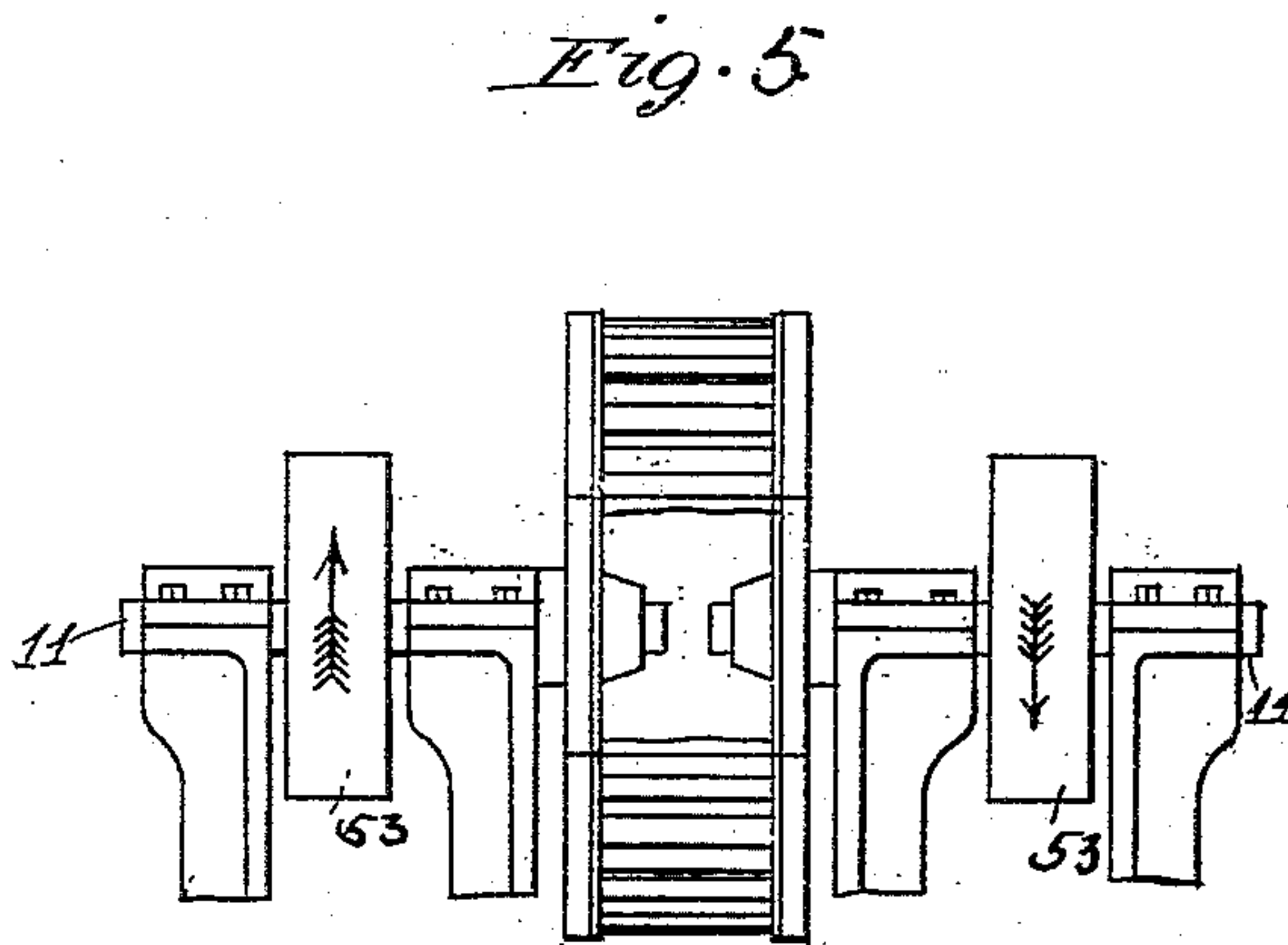
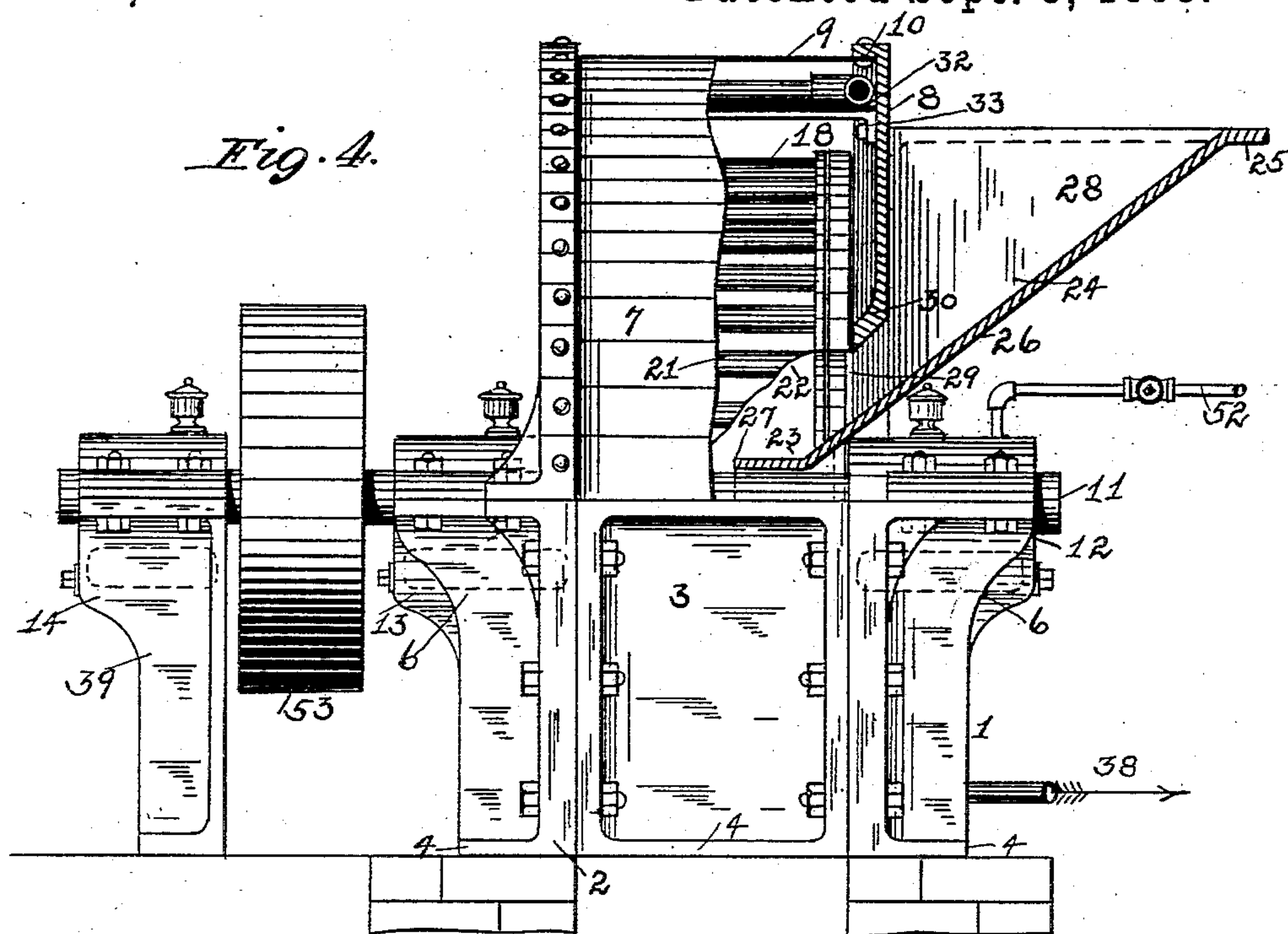
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UNITED STATES PATENT OFFICE.

HERMAN S. ALBRECHT, OF ST. LOUIS, MISSOURI.

MACHINE FOR DISINTEGRATING CLAY, ORES, &c.

SPECIFICATION forming part of Letters Patent No. 504,689, dated September 5, 1893.

Application filed September 21, 1892. Serial No. 446,371. (No model.)

To all whom it may concern:

Be it known that I, HERMAN S. ALBRECHT, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Machines for Disintegrating Clay, Ores, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in machines for disintegrating clay, ores, &c., and consists in the novel arrangement and combination of parts as will be more fully hereinafter described and set forth in the claims.

I am well aware that disintegrators comprising fixed and movable revolving cages are already in use, but in the construction of my improvements I have combined facilities for the feeding of the material into the cages, a means for heating the outer shell adjacent said cages which prevents the material from collecting upon said shell and retarding the operation of the machine.

In the drawings: Figure 1 is a top plan view of an improved disintegrator. Fig. 2 is an end sectional view taken on a line 2—2 in Fig. 1 and showing the arrangement of the steam pipes made use of in carrying out a feature of my invention. Fig. 3 is a top plan view of a disintegrator constructed after the method of my invention and showing the outer shell broken away and the hopper removed. Fig. 4 is a sectional side elevation, with part of the outer shell broken away and showing the hopper and side frame of the shed in section. Fig. 5 is a modification view of a disintegrator consisting of two revolving cages mounted upon separate shafts and revolving in different directions.

Referring to the drawings: 1 indicates the base frame which consists of two side castings 2 and two end castings 3. The two side castings 2 as well as the end castings 3 are provided with flanges 4 at their bottom edges, which form a foundation to support said castings and parts connected therewith. The two end castings 3 are provided at each side with projecting flanges 5 by means of which said end castings 3 are bolted to the side castings 2, as shown in Figs. 3 and 4 of the illustrations. The side castings 3 are also provided with projecting castings 6 which form the base

construction for bearings hereinafter described.

Upon the base 1, previously described, is adapted to fit a shed or covering 7 which consists of two end frames 8 bolted upon the top of the end castings 2 and the tops of which are segmental in form, that is, they describe the shape of a segment of a circle. The edges of the two end frames 8 are in alignment and have a hood or shed of sheet metal 9 riveted thereto, said metal 9 being secured to inwardly projecting flanges 10 upon the peripheries of the end frames 8. A shaft 11 has its bearing in bearings 12, 13 and 14, the bearings 12 and 13 being provided by the projections 6 upon the end castings 2. Caps 15 are provided for the bearings 12, 13 and 14.

As is usual in the construction of disintegrators, one of the cages is fixed to the frame, while the other is keyed upon the shaft 11 and therefore revolves with the same. The revolving cage consists of a number of annularly arranged series 16, 17, and 18 of horizontal breaking arms, while the fixed cage consists of annularly arranged series 19 and 20 of similar breaking arms. The relative position of the series of fixed breaking arms and revolving breaking-arm, is alternate—that is, the series 19 of fixed arms is located between the series 16 and 17 of the revolving arm and the fixed series 20 is located between the central revolving series 17 and the outer series 18.

Suitable means is provided to define the position of the series of fixed and revolving breaking-arms 21 in order that their functional operation will be separate and distinct. The construction as shown in Fig. 2 leaves a central portion 22 into which the discharge end 23 of the hopper 24 projects, and said space 22 is adapted for the reception of the material discharged by the hopper.

I will now describe the construction, and the manner of securing the hopper to the frame. The upper end of the hopper is outwardly flared for the reception of the material and has a top flange 25 which surrounds three sides of the top of said hopper 24. The bottom of the hopper consists of an inclined construction 26, the lower and inner end 27 of which is constructed to form an apron which fits over the shaft and extends horizontally therefrom to the sides 28 of the hopper 24.

Said sides 28 are also outwardly and upwardly flaring and have their inner edges riveted to the end frame 8 of the shell 7, said shell 7 being provided with an opening 29 which allows the ingress of material from the hopper 24. Projecting inwardly and downwardly from the upper edge of the opening 29, is a projection or flange 30 which prevents the material from deviating from its desired course. The frame-work 1 is open at the bottom to allow of the discharge of the pulverized material from the cages.

I will now proceed to describe a heating-chamber made use of in carrying out the idea of my invention and the function of which is to prevent the collecting of the material upon the inner side of the shell which surrounds the cages upon three sides and which collection would retard the successful operation of the machine. The necessity of an improvement of this kind will be apparent especially when the material to be pulverized contains any great amount of moisture, such as clay for the manufacture of brick. The moist material when thrown by the cages against the inner side of the shell would adhere to the same, in small particles until quite a large mass of it would be congregated, and the successful operation of the machine retarded. The heated chamber 31 consists of a construction 32 preferably made of thin sheet metal and which runs from one side to the other side of the frame 1 and follows the general outline of the cages and extends downwardly even with the foundation upon which the machine rests. Suitable cross-braces 33 are secured to the end frames 8 and at a point a short distance within the metal shell 9 and upon the cross-pieces 33 is secured the interior shell 32. At a point below a line drawn horizontally through the shaft 11, the edges of said metal shell 32 are suitably bolted or riveted to the end castings 2. The side castings 3 are provided with inwardly projecting flanges 34 to which the lower terminal ends of said shell 32 are bolted or riveted. The other wall of the chamber 31 consists of a shell 9 previously described and in the chamber 31 between the shells 9 and 32 are suitably mounted a number of longitudinal pipes 35 which are connected in pairs and the pairs connected with each other by U couplings 36. This construction forms a continuous conduit from the pipes 37 which lead from the source of heat generation to the outlet pipe 38 which leads to an exhaust or any other desirable means for disposing of the hot air or steam. The pipes thus arranged rest upon the shell 32 and conform to its general outline. The outer shell 9 being of considerable thickness prevents the heat from being thrown outwardly, but instead it is intended to and does affect the material within the inner shell 32. As is well known, the material when fed from the hopper 24 through the opening 29 into the interior 22 then ac-

quires a vertical motion and is caused to run through the breaking arms 21 by centrifugal impulse and is pulverized by percussion by the rapid blows of the revolving arm. The above described operation has a tendency to locate fine particles of material in the corners of the shell by reason of the moisture contained in said particles. Therefore, by keeping the shell 32 heated to a high temperature by means of steam or hot air being continuously passed through the pipes 35, it prevents the collection of these particles in the corners, as they become dried out and fall away from their engagement with the shell or other parts. As hereinbefore stated the projection 6 upon the end castings 2 provide the bearing blocks or bases for the bearings 12 and 13, while a pillow block casting 39 which is suitably secured to the foundation upon which the machine is mounted, supports the bearing 14.

In Fig. 7 I have shown an improved integrator, the improvement lying in the revolving of both the crushing cages, the same being mounted upon separate shafts adapted to revolve in different directions. The shafts are necessarily mounted in their individual bearings and driven by separate operative pulleys. The casing of the machine to protect and cover the cages and the heating chamber would be mounted upon a separate frame-work, the same being adjacent the revolving construction. Suitable bolts or other means for securing the cap 15 upon the bearing block are provided and a driving pulley 53 is mounted upon the shaft 11 between the bearings 13 and 14.

Having fully described the construction of my invention, I will now proceed with its operation. The improved machine is adapted for the pulverizing of clay for manufacturing of tiling or bricks, ores for refining, bones for fertilizing, and many other elements which it is not necessary to enumerate. The raw material is fed into the hopper 24 by some suitable carrying device and when it is discharged into the hopper it is probably in large lumps and the object of the machine is to thoroughly pulverize all of this material and render it in such a state that it can be readily handled and reduced to other and different conditions. The material upon entering the open space 22 is caught up by the revolving series 16 of breaking-arms and by reason of the centrifugal motion of said series 16, the material is crushed or broken by percussion and as it is passed through the various series of fixed and revolving breaking-arms, it is rapidly reduced to a powder or pulverized state and drops down through the open discharge at the bottom of the frame-work 1. The advantages gained by the heating of the material during the operation of disintegrating forms an advantageous feature which will be well understood by reference to the foregoing description and needs no further explanation in this connection.

The advantages which would be gained in the operation of the construction shown in Fig. 5 are apparent, as well as the cost of manufacture of same and its maintenance, which would be materially lessened.

Having fully described my invention, what I claim is—

1. An improved disintegrator having a supporting base consisting of end castings 2, side castings 3, said side and end castings bolted together, end frames 8 mounted thereon and secured thereto, a peripheral shell 32 mounted upon and secured to cross braces 33 the ends of which are secured to said side frames 8, an outer shell 9 riveted to the peripheral flanges 10 upon said side frames 8, and a series of horizontally arranged pipes 35 connected by

couplings 36 between said shells 9 and 32, substantially as set forth.

2. An improved disintegrator having a heating chamber consisting of a series of horizontally arranged pipes 35 in parallel alignment with each other, said pipes located between an inner shell 32 and an outer shell 9, a shaft 11 mounted in suitable bearings, a revolving crushing cage keyed upon said shaft 11, a driving pulley 53 for operating said shaft 11, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN S. ALBRECHT.

Witnesses:

HERBERT S. ROBINSON,
ALFRED A. EICKS.