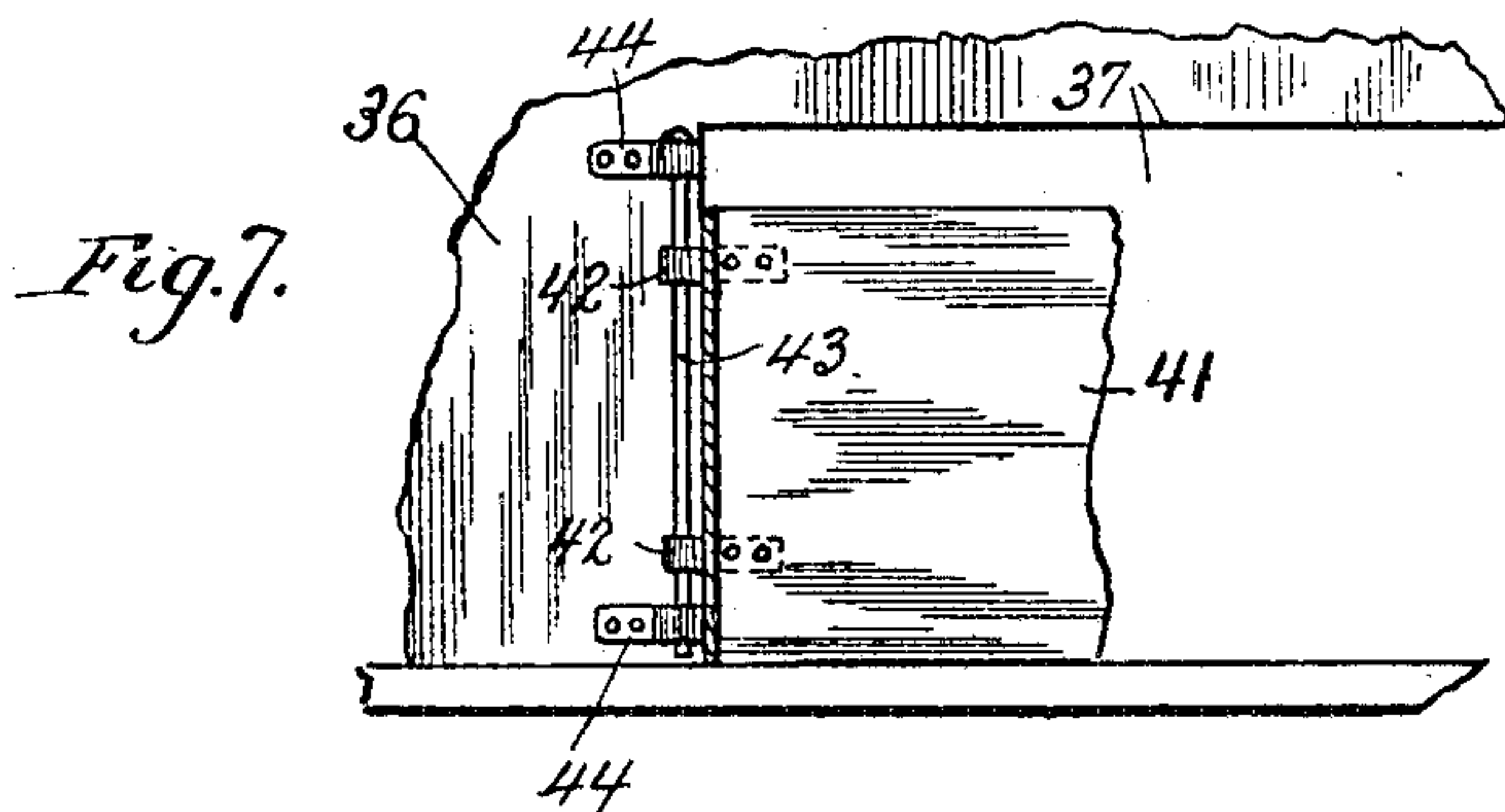
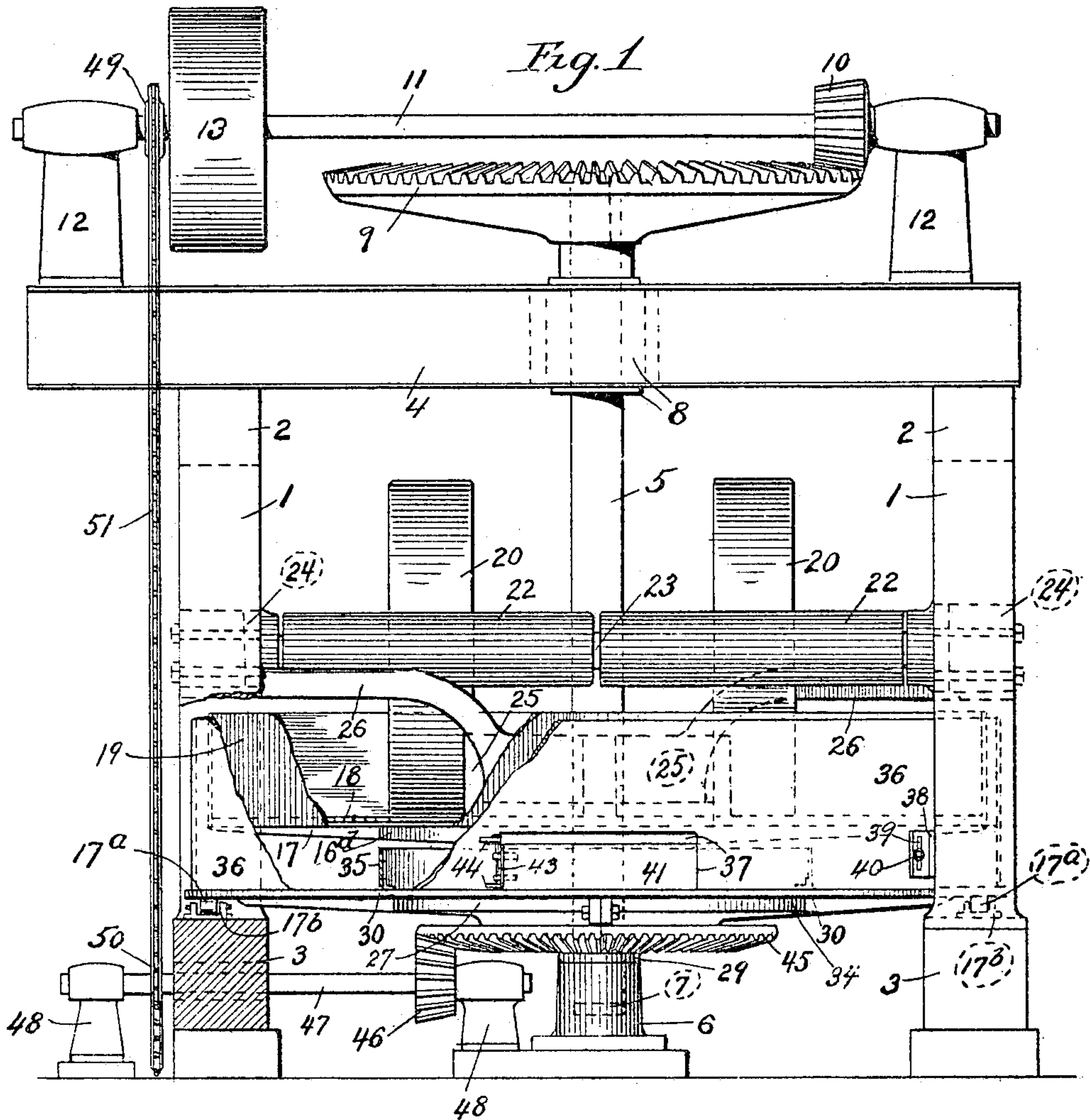


No. 799,039.

PATENTED SEPT. 12, 1905.

H. J. FLOOD.
CHASING MILL.
APPLICATION FILED OCT. 6, 1902.

3 SHEETS—SHEET 1.

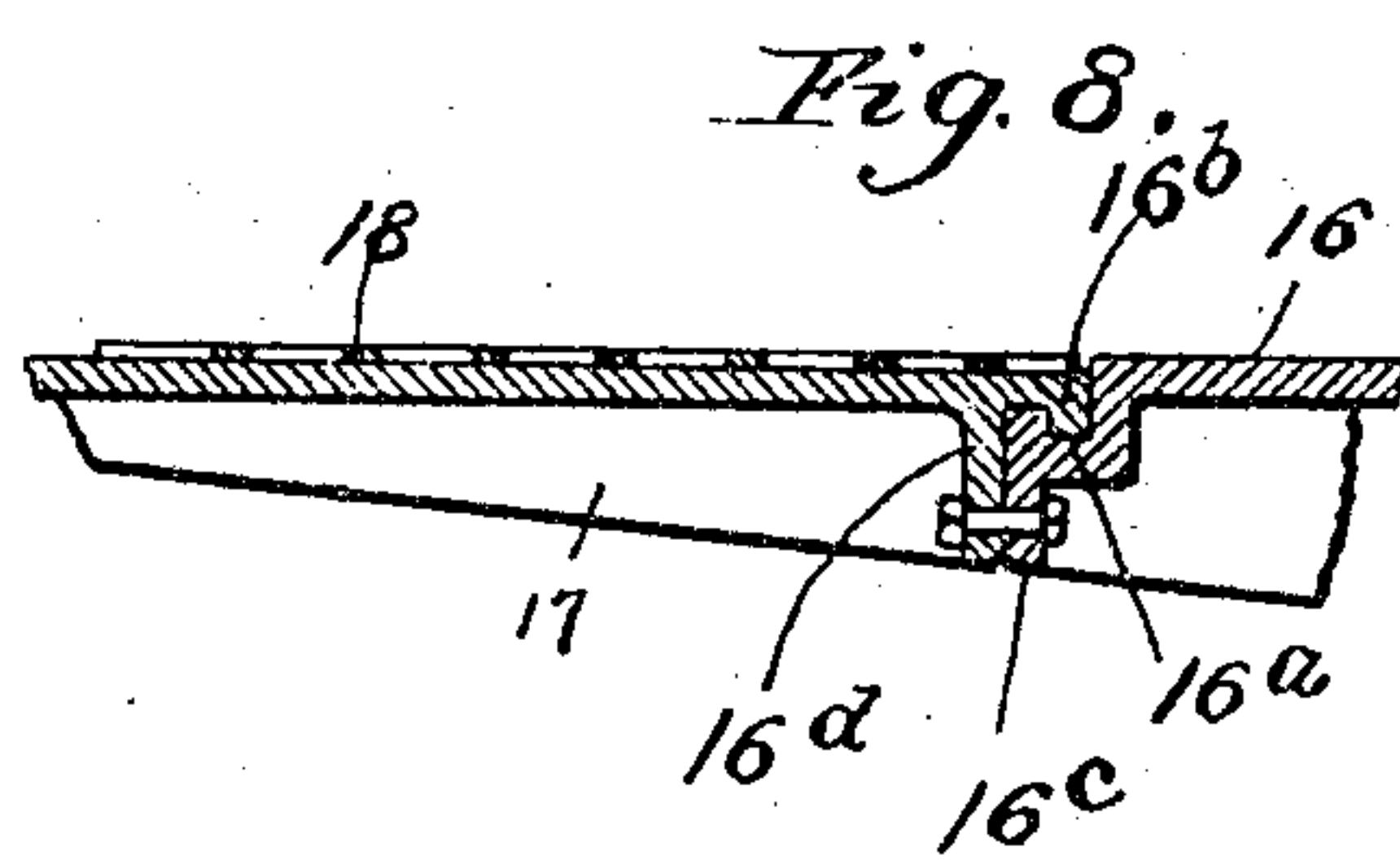
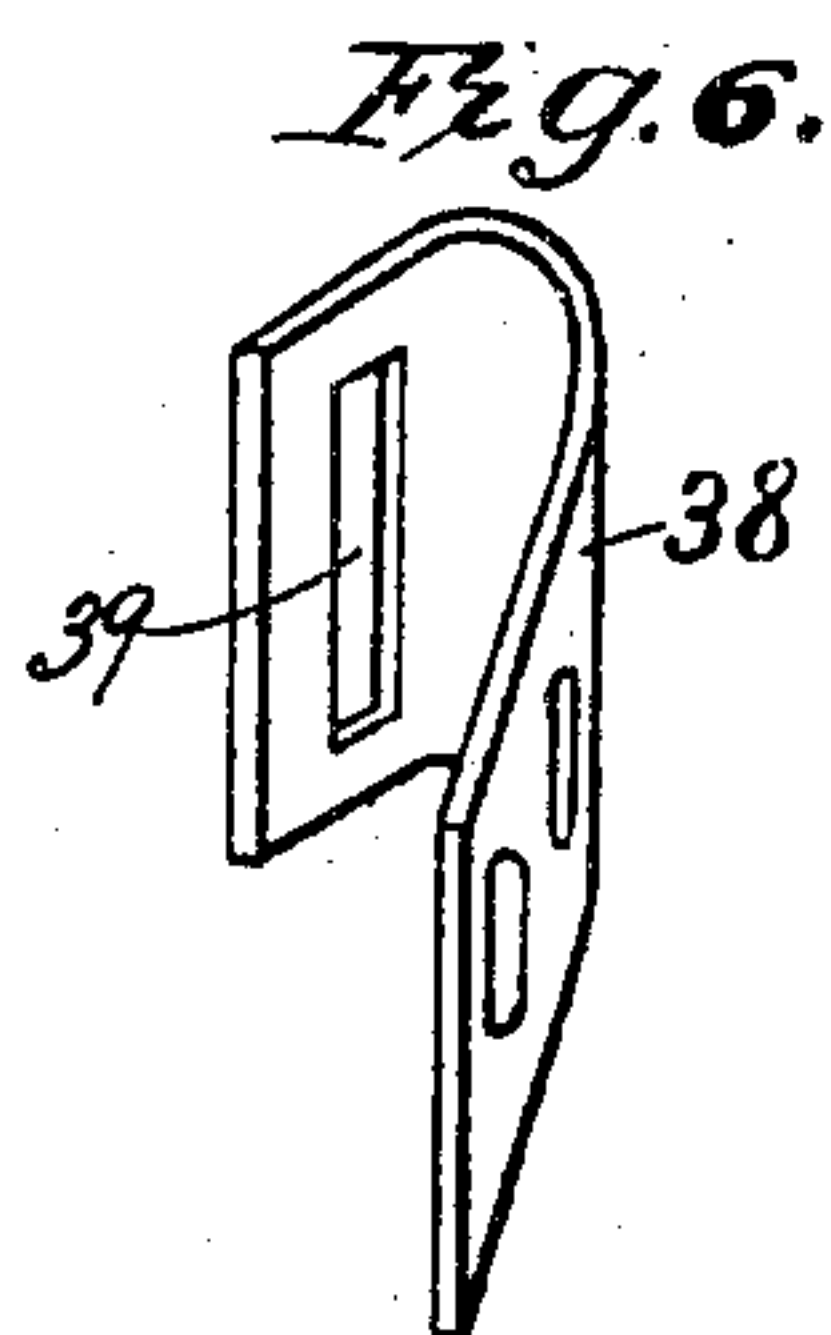
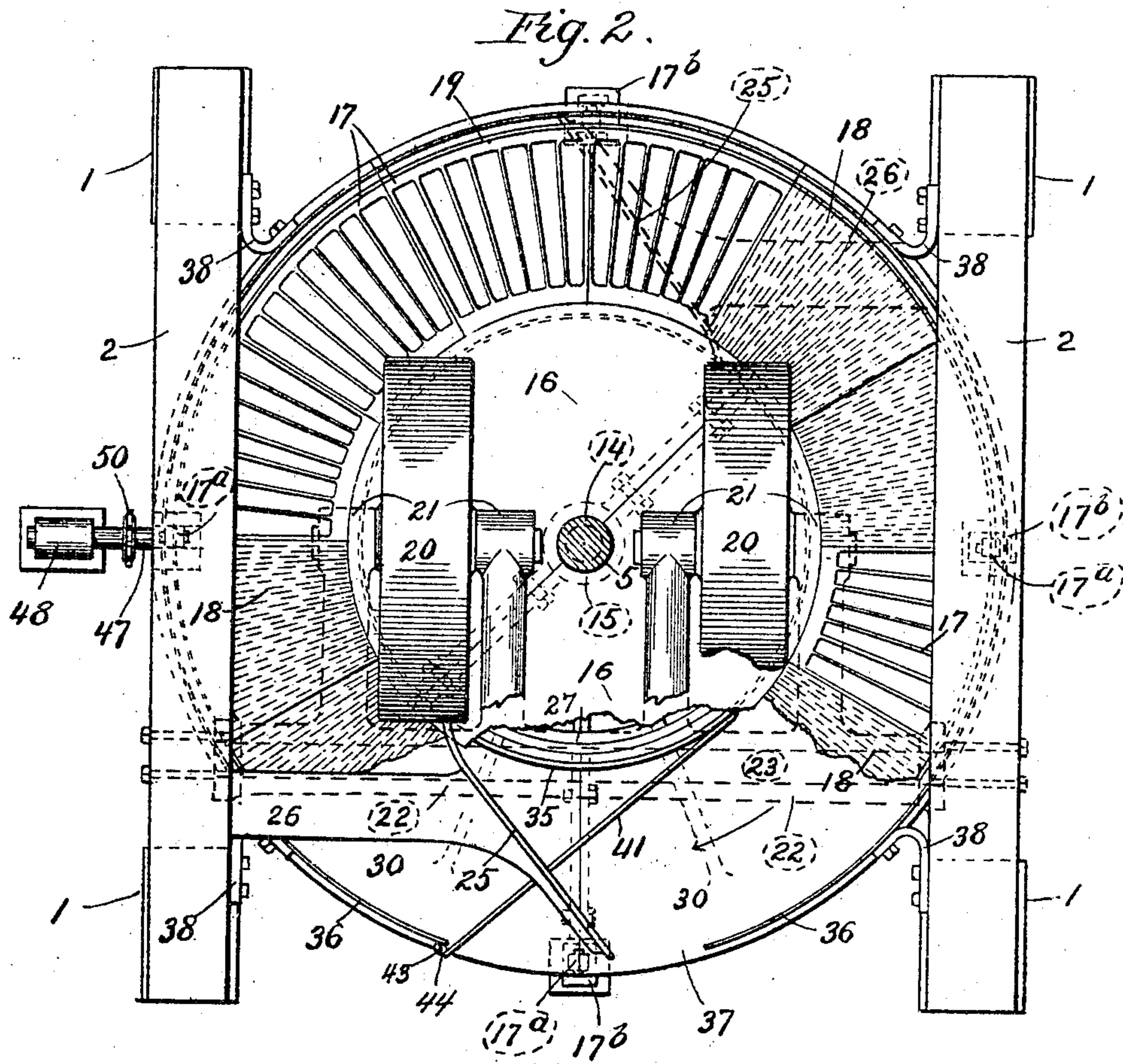


Witnesses
Jacob Rothschild.
S Wolf

Inventor
Harry J. Flood
By *Howard M. Cox*
Attorney

H. J. FLOOD.
CHASING MILL.
APPLICATION FILED OCT. 6, 1902.

3 SHEETS—SHEET 2.



Witnesses
Jacob Kottelniek
S. Wolf

Inventor
Harry J. Flood
By Howard M. Cox
Attorney

H. J. FLOOD.
CHASING MILL.
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3 SHEETS—SHEET 3.

Fig. 3.

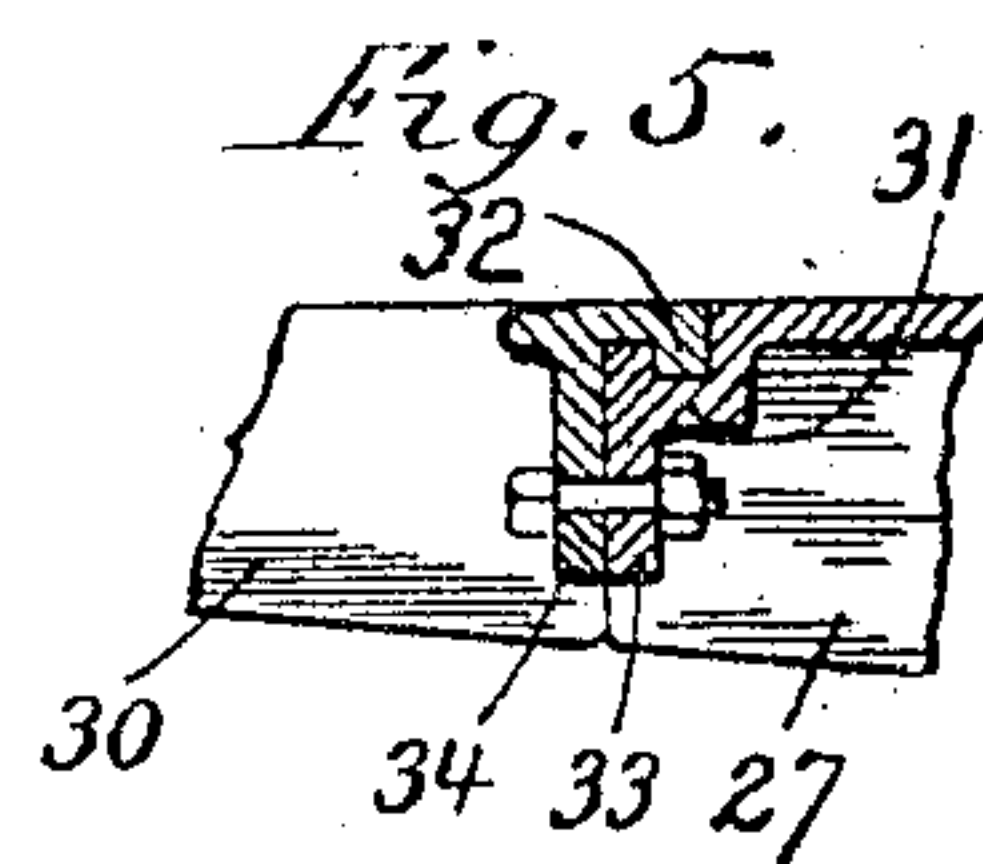
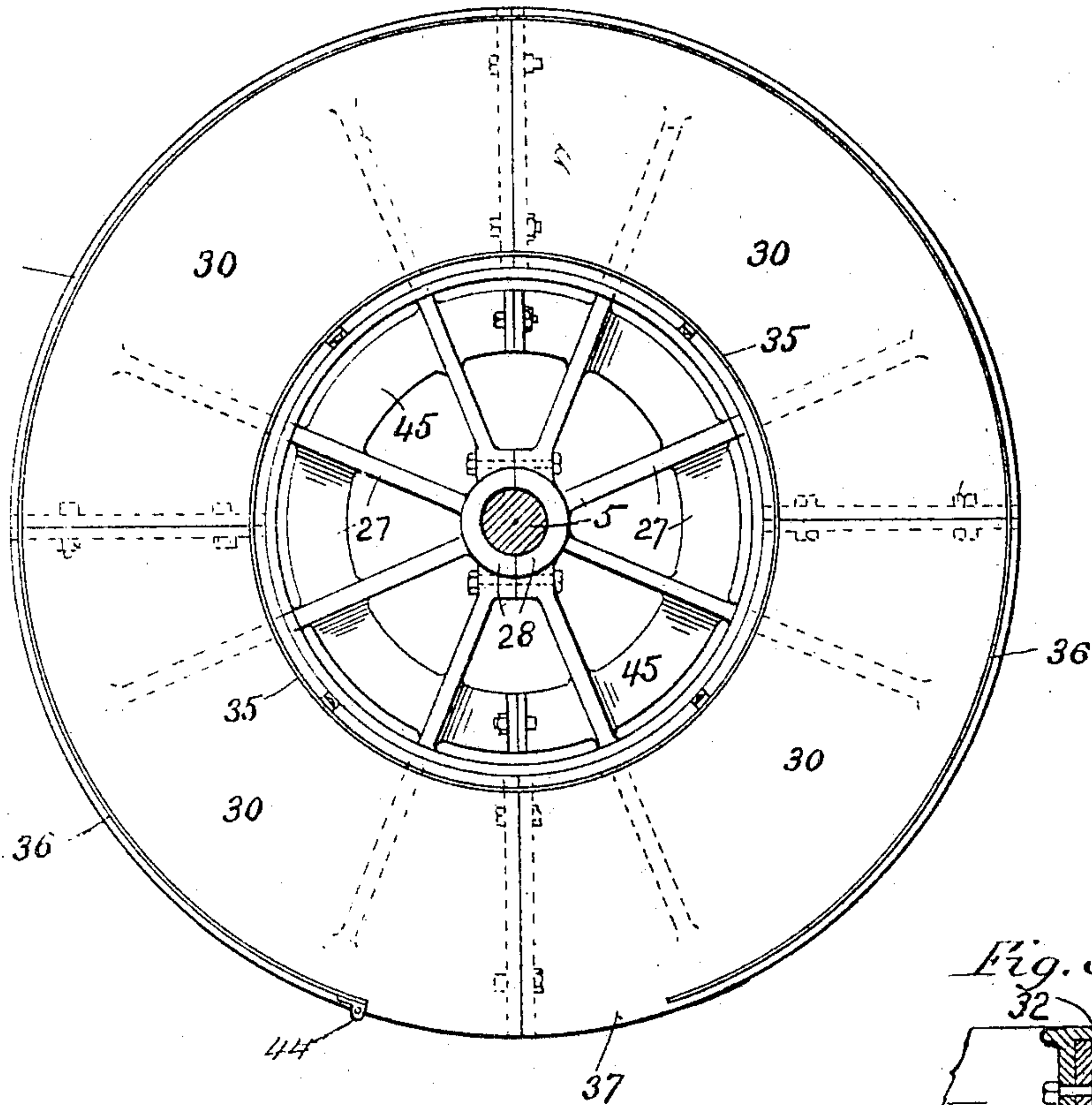
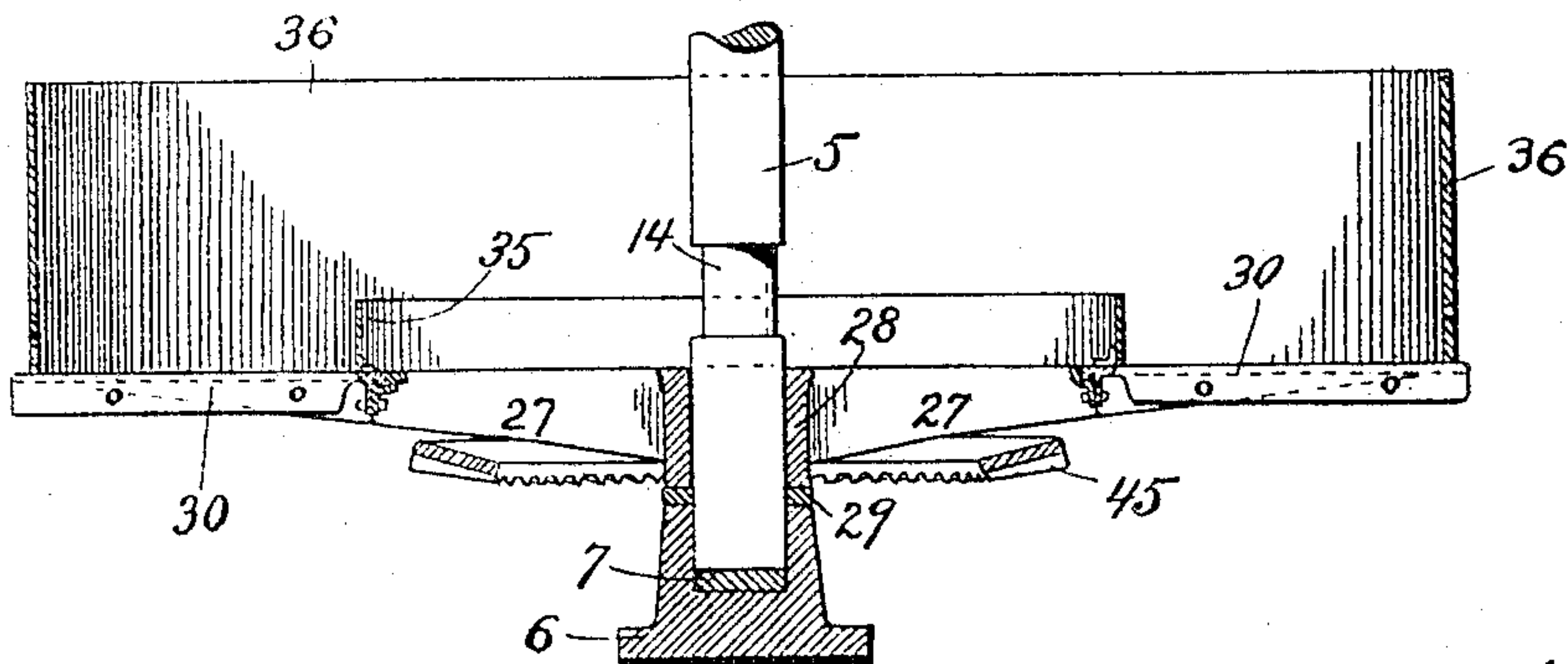


Fig. 4.



Witnesses
Jacob Rathsches.
S. Wolf

Inventor
Harry J. Flood
By *Howard M. Cox*
Attorney

UNITED STATES PATENT OFFICE.

HARRY J. FLOOD, OF CHICAGO, ILLINOIS.

CHASING-MILL.

No. 799,039.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed October 6, 1902. Serial No. 126,127.

To all whom it may concern:

Be it known that I, HARRY J. FLOOD, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Chasing-Mills, of which the following is a specification.

My invention relates to chasing-mills, especially of the type known as "dry pans," for pulverizing clay and other materials; and the objects of the invention are to facilitate the discharge of the pulverized material, to prevent clogging of the machine, and provide certain details of construction hereinafter more fully set forth. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a general view of the machine in elevation. Fig. 2 is a general plan view showing the parts below the upper driving-gear. A portion of the screen is broken away to show the secondary revolving floor and its scraper. The position of the arms holding the crushing-rollers is indicated chiefly by dotted lines. Fig. 3 is a plan view of the secondary revolving floor. Fig. 4 is a central vertical section thereof. Fig. 5 is a sectional detail view showing the preferred manner of connecting the inner and outer sections of the secondary floor. Fig. 6 is a perspective view of a bracket for retaining the lower curb in position. Fig. 7 is a detail view showing a portion of the lower curb and manner of attaching the scraper thereto. Fig. 8 is a sectional detail view showing the preferred manner of connecting the outer screen-segments to the central imperforate portion of the grinding and screening pan.

Similar reference characters denote similar parts throughout the several views.

The chief members of the main framework of the machine are the uprights 1 1, cross-beams 2 2 supported thereon, sills 3 3 carrying said uprights, and the cross-beams 4 4 mounted on the cross-beams 2.

The vertical main shaft 5 is revolubly supported at its lower extremity in the step 6, and by preference the brass wearing-plate 7 is provided in said step to receive the weight of said shaft. Near its upper extremity said shaft is journaled in a bearing 8, carried by the cross-beams 4. The bevel-gear 9 is keyed or otherwise rigidly fastened to the shaft 5, at the upper extremity thereof, and is driven by the bevel-pinion 10, fastened to the horizontal driving-shaft 11. Said pinion-shaft is

journaled in the bearings 12 12 on the cross-beams 4 and is driven by the band-wheel 13.

A short distance above the top of the step-bearing 6 the shaft 5 has a recess 14 for receiving the hub 15 of the central portion 16 of the pan. Said central portion is keyed or otherwise fastened to the shaft 5, so as to rotate therewith, and is preferably formed in two sections and bolted together. This recessing of the vertical shaft 5 and forming the central portion 16 in two parts affords a simple but secure method of retaining the pan at a definite height upon said shaft and at the same time affords ready means for removing the portion 16 without disturbing the other parts of the machine. Said central portion 16 is circular in outline and has the segments 17 17 bolted or otherwise fastened to its periphery for supporting the screen-sections 18 18. In the preferred construction an annular channel 16^a is provided in the parts 16 for receiving the corresponding flange 16^b on said screen-segments, as best shown in Fig. 8. The depending flange 16^c on said parts 16 is then adapted to be bolted to the depending flange 16^d on said segments. The upright cylindrical wall or curb 19 is fastened to the circular periphery of the segments 17 and revolves therewith to retain on the revolving pan such material as has not passed through the screen. The grinding-rollers 20 20 roll upon the imperforate portion 16 of the pan and are held in place by being pivotally mounted in the free extremities of the roller-arms 21. Said arms extend in pairs from the sleeves 22. Said shaft is fixed in the frame-pieces 24, carried by the uprights 1 of the framework of the machine.

The arrangements of the parts is such that when the shaft 5 is rotated by its driving-gear the pan parts 16, 17, 18, and 19 also revolve. The clay or other material upon the central portion of the pan is thus brought under the rollers 20 and crushed, and on account of the centrifugal action due to the revolution of the pan said material is then thrown outward onto the screen-sections 18 and such of the material as is ground sufficiently fine passes down through the same. In order to return the remaining coarser portion of said material to the center of the pan to be again subjected to the action of the rollers, the plows 25 25 are provided. These plows are stationary, and a convenient method of supporting them is by means of the arms or brackets 26, bolted to the frame-pieces 24.

The portion of the machine thus far described is not materially different from other machines now known in the art, the novel features being in connection with the secondary floor and its adjuncts, which will now be described.

The lower spider 27 is preferably formed in two sections bolted together, so that the hub 28 thereof encircles the shaft 5 below the pan 16. Said spider-hub loosely encircles said shaft so as to rotate independently thereof and bears upon the washer 29 upon the step 6. Said spider is circular and concentric with said shaft and is bolted at its periphery to the floor-segments 30. It is desirable that the attachment of said floor-segments to said spider be rigid, and to this end the parts are designed to interlock, as best shown in Fig. 5. In the construction shown the spider 27 has an annular recess or channel 31, which receives the corresponding flange 32, and the depending flange 33 on the spider 27 abuts the depending flange 34 on the segments 30. Said flanges 33 and 34 also afford means for bolting said segments and spider together. Said segments are also bolted to each other to form a continuous ring or annular floor, and the parts are so constructed that when assembled the upper surfaces of the floor-segments 30 are a few inches beneath the screen-sections 18, so as to receive the clay or other material dropping through the same.

The inner annular curb or wall 35 is fastened to the floor-segments 30 and is of such a height as not to interfere with any portion of the upper revolving pan. Said curb is concentric with the shaft 5 and has a diameter somewhat less than the inner diameter of the screen-sections 18, so that material falling through said screen-sections will fall on the exterior side of said wall or curb and be retained thereby on the floor-sections 30. Near the outer periphery of said floor-sections 30 is the outer curb 36, which is also concentric with said shaft and has a diameter greater than the greatest diameter of the screen-sections 18. By preference said outer curb is greater in diameter than the greatest portion of the upper pan and of such a height as to extend above the bottom of said upper pan, thus forming in connection with the floor-segments 30 a receptacle for the clay or other material after it has dropped through the screen-sections. At one portion of said outer curb is the discharge-opening 37, and inasmuch as the discharge should always be made at the same point said outer lower curb 36 does not revolve with the secondary floor, but is held by brackets 38, fastened to the uprights 1. Said curb rests by gravity upon said secondary floor, and in order to allow for wear said brackets are provided with slots 39 for receiving the bolts 40. Said bolts are secured to said curb and extend through said slots in such a manner as to permit the ver-

tical play of said curb. The advantage in this construction, which allows vertical movement of the curb, is that the constant rubbing of the curb on the slowly-revolving secondary floor prevents the building up of the clay or other plastic material on said floor, as it would be liable to do if the curb were vertically immovable. In order to remove the pulverized clay or other material through the said opening 37, a scraper 41 is arranged in such a manner as to be supported on the floor-segments 30, with its inner extremity in contact with the lower inner curb 35 and the outer extremity at one extremity of the discharge-opening 37 in the outer lower curb 36. Said scraper is preferably of sheet metal and extends obliquely, so that the extremity at the outer curb is in advance of the extremity in contact with the inner curb—that is, the pulverized material as it progresses with the slow rotary motion of the secondary floor first reaches the inner extremity of said scraper and is thence gradually forced outward along the face of said scraper to the opening 37 in said outer curb. In order to compensate for wear and prevent the building up of plastic pulverized material on said secondary floor, the attachment of said scraper is such as to permit the free vertical movement thereof. At the outer advance extremity of said scraper are the hinges 42 42, which receive the slip-pin 43, as best shown in Fig. 7. The corresponding hinges 44 44 are fastened to the outer curb 36 and also receive said slip-pin; but the hinges 42 are vertically at a slight distance from the hinges 44, so as to permit the vertical play of said scraper. The inner end of said scraper is without fixed attachments, but makes contact with the inner curb 35 in such a manner that the pulverized material moving in the direction of the arrow, Fig. 2, tends to force said scraper end into contact with the said inner curb. This construction, besides its simplicity, has the advantage of preventing the compacting of plastic pulverized material against said inner curb. The wearing of the inner extremity of said scraper due to the friction against said inner curb 35 tends to make said inner extremity conform to said curb, and the scraper is therefore practically self-sharpening and completely effects the shifting of the pulverized material toward the discharge-opening 37.

It is desirable that the secondary floor be supported at its periphery as well as at its center, and to this end the rollers 17^a are provided, mounted in suitable bearings 17^b in such a manner as to lie beneath and make contact with the outer rim of the screen-segments 17.

As above mentioned, the hub 28 of the spider 27 is loosely mounted on the shaft 5, and the secondary floor is therefore revoluble independently of the grinding-pan. The rotation of said secondary floor is accomplished by means of the bevel-gear 45, which is rig-

idly connected to said spider and is preferably cast integral therewith. Said gear is driven by means of the bevel-pinion 46, fixed on the shaft 47. Said shaft is journaled in suitable bearings 48 48.

In order that there may be a definite relationship between the speeds of rotation of the pan and secondary floor, it is preferable that the motion of the shaft 47 be derived from the upper driving-shaft 11. For this purpose the shaft 11 is provided with the sprocket 49, which is connected to the sprocket 50 on the shaft 47 by means of the link chain 51.

The parts are so designed and proportioned that the secondary floor revolves at a much slower speed than the grinding and screening pan, and by preference said pan and secondary floor are made to revolve in the same direction.

In the operation of the machine the rotation of the shaft 11 causes the rotation of the shaft 5 and the consequent rotation of the grinding and screening pan. Clay or other material to be pulverized is introduced into said pan and by the motion of the pan is brought under the rollers 20. Said material is then thrown by centrifugal force outwardly over the screen-sections 18 and the finer particles pass through the same and are received upon the secondary floor beneath. The material which has not passed through is thrown by the plows 25 back into the path of the rollers and again submitted to the crushing action thereof. The screened material upon the secondary floor is by the slow revolution of said floor gradually brought around until it comes into contact with the obliquely-set scraper 41 and is thereby shifted toward the discharge-opening 37, from whence it is removed by belt conveyers or in any other suitable manner. The fast-moving grinding and screening pan deposits the pulverized material in a uniformly thick layer upon the secondary floor, and consequently as the motion of said lower floor is uniform the discharge of pulverized material therefrom is also uniform, which is of distinct advantage for the reasons hereinabove mentioned. The lower outer curb 36, being non-revoluble, but vertically movable, rests by gravity upon the secondary floor and by the consequent rubbing action prevents the building up of the screened material upon said secondary floor. In a similar manner the continual pressure of the scraper 41 against the inner curb 35 prevents the building up of the screened material against said inner curb.

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

1. In a chasing-mill, the combination of a

roller, a grinding-pan revolving beneath said roller, a screen in said pan, a floor beneath said pan adapted to revolve at a different speed therefrom, and a non-revoluble but vertically-movable curb resting by gravity upon said revolving floor for the purpose described.

2. In a chasing-mill, the combination with the pulverizing parts, of a revolving floor for receiving the material after pulverization, a curb fixed to said floor and revolving therewith, and a scraper for removing the pulverized material from said floor, the outer extremity of said scraper being pivoted at a fixed point, and the inner extremity thereof making sliding contact with said curb for the purpose described.

3. In a chasing-mill, the combination with the pulverizing parts, of a revoluble floor for receiving the material after pulverization, an inner curb fixed to said floor, an outer non-revoluble curb, having a discharge-opening therein, and a discharging-scraper pivoted at its outer end to the outer curb at one side of the said opening therein, and having its inner end resting against the inner curb, whereby the advancing material holds the scraper against said inner curb.

4. In a chasing-mill, the combination of a grinding-roller, a grinding-pan revolving beneath said roller and having a perforate portion forming a screen, a secondary discharge-floor rotating at a different speed below said pan in position to receive the material dropping through the screen portion of said pan, an inner curb revolving with said floor, an outer non-revoluble curb, a discharge-opening in said outer curb and a discharge-scraper attached to said outer curb and freely movable toward and from said floor.

5. In a chasing-mill, the combination, with the pulverizing parts, of a revolving floor for receiving the material after pulverization, a curb revolving with said floor, a pivoted discharge-scraper extending obliquely across a portion of said floor so that the pulverized material would first reach the inner portion of said scraper and the outer portion later in its motion with said floor, the inner end of said scraper making contact with said curb and being automatically held in contact therewith, by the material upon said floor; and a hinged mounting for said scraper, the pivot for said hinged mounting being fixed, and the inner end of said scraper being free to swing toward and from said inner curb to compensate for wear.

HARRY J. FLOOD.

Witnesses:

ARTHUR M. COX,
S. WOLF.