

No. 825,793.

PATENTED JULY 10, 1906.

A. J. ARTHUR.  
SEPARATOR.

APPLICATION FILED JAN. 6, 1906.

2 SHEETS—SHEET 1.

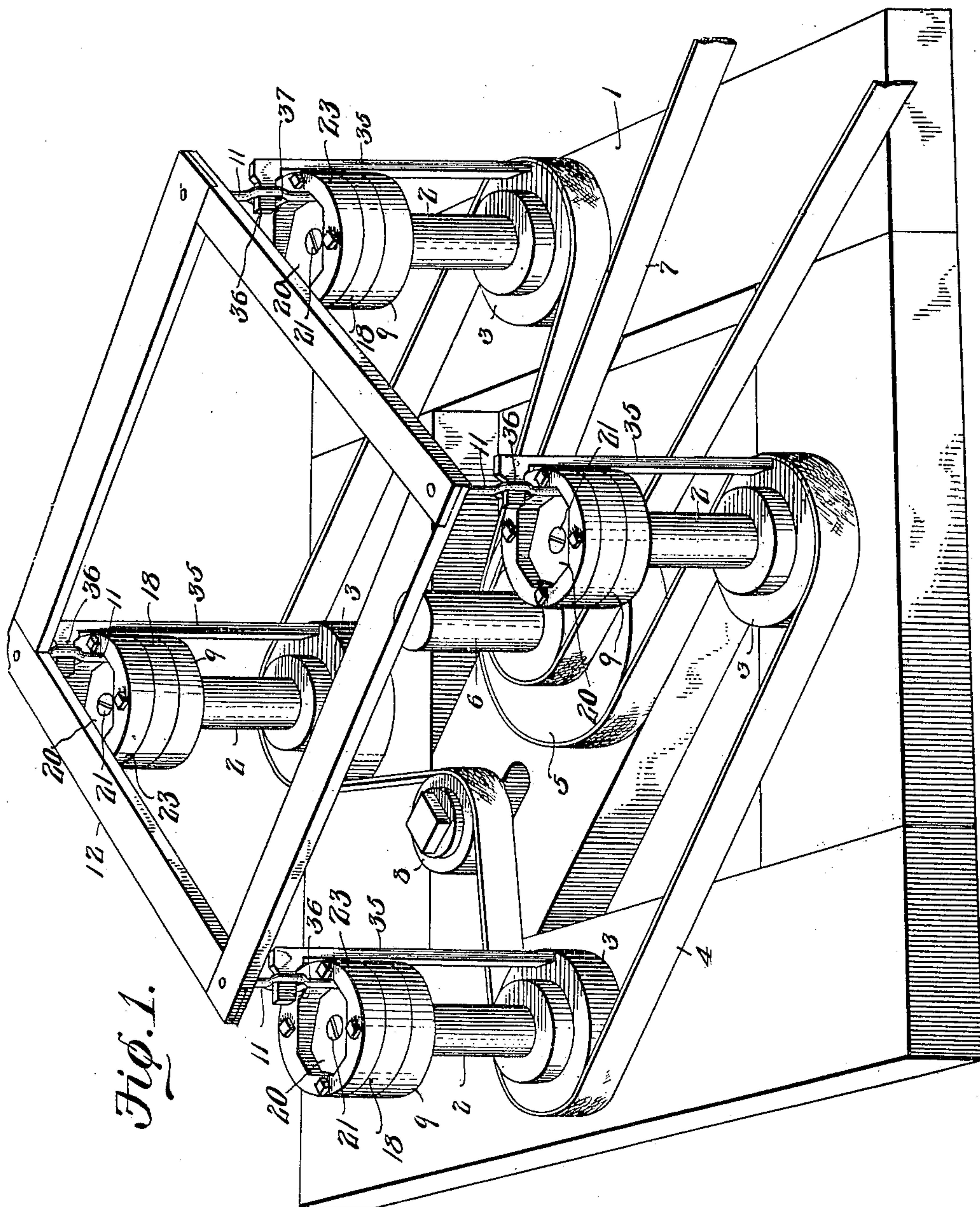


Fig. 1.

WITNESSES:

*E. J. Almont*  
*Wm. Bagger*

*Andrew J. Arthur,*  
INVENTOR.

By *C. A. Snow & Co.*  
ATTORNEYS

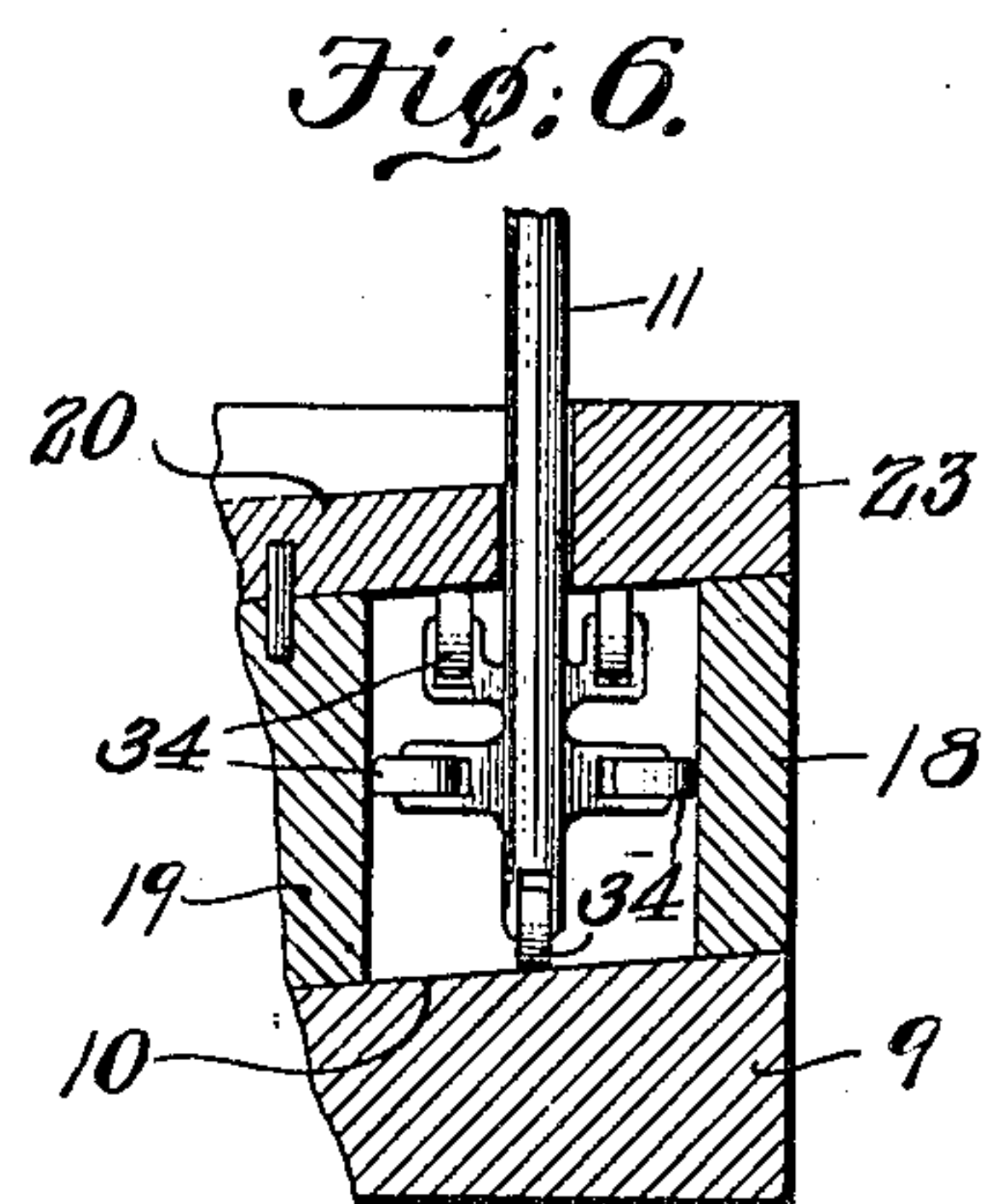
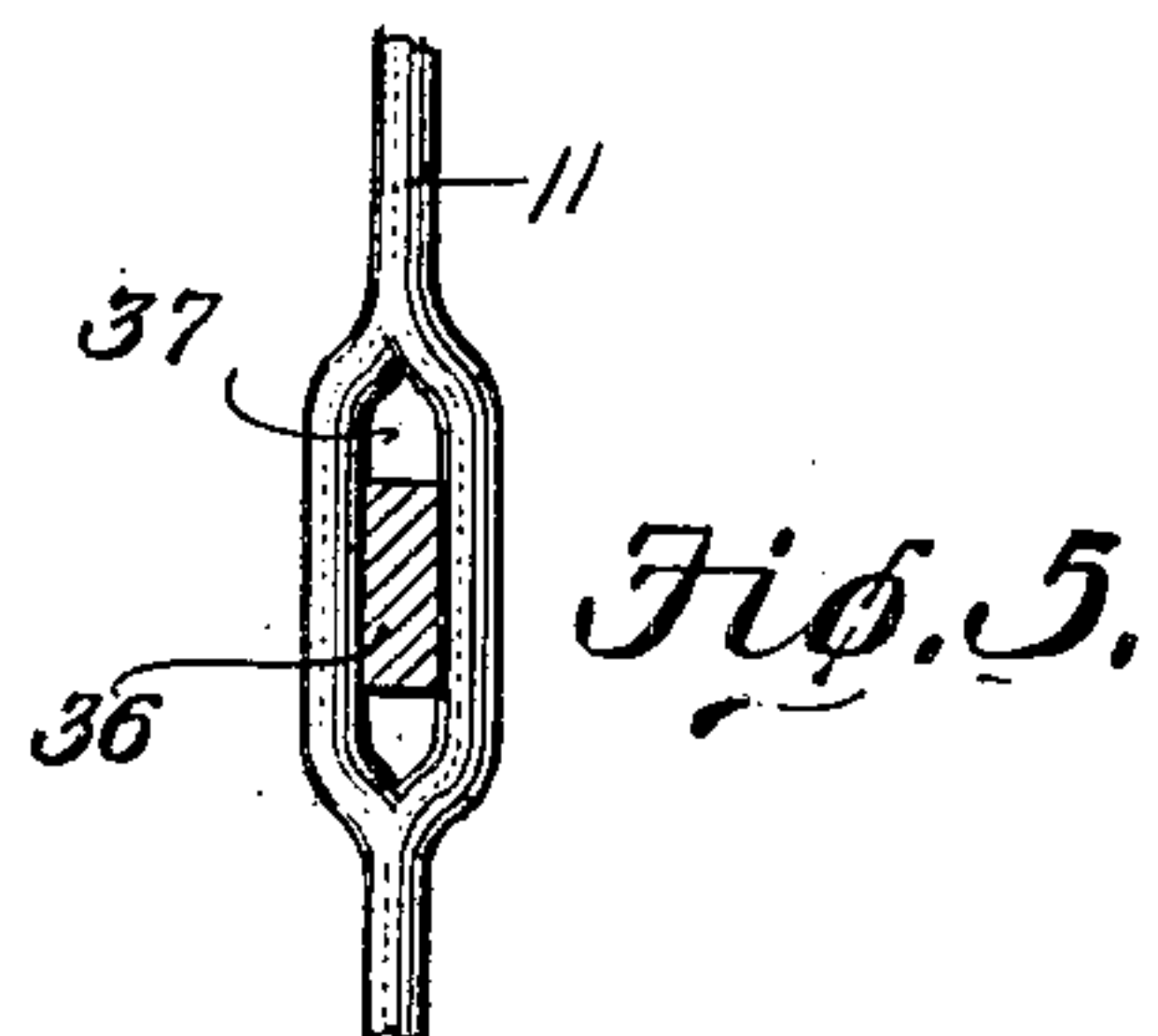
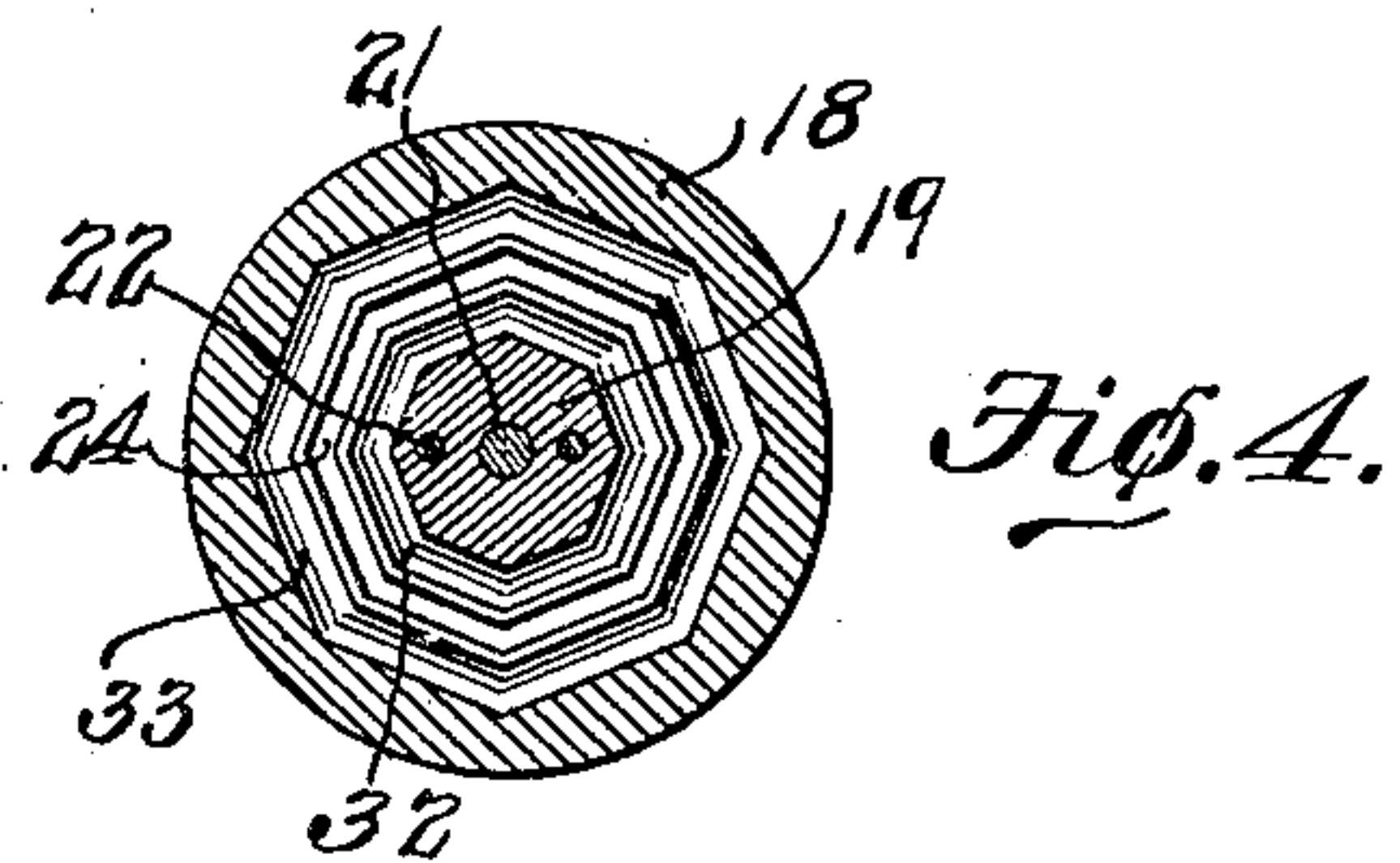
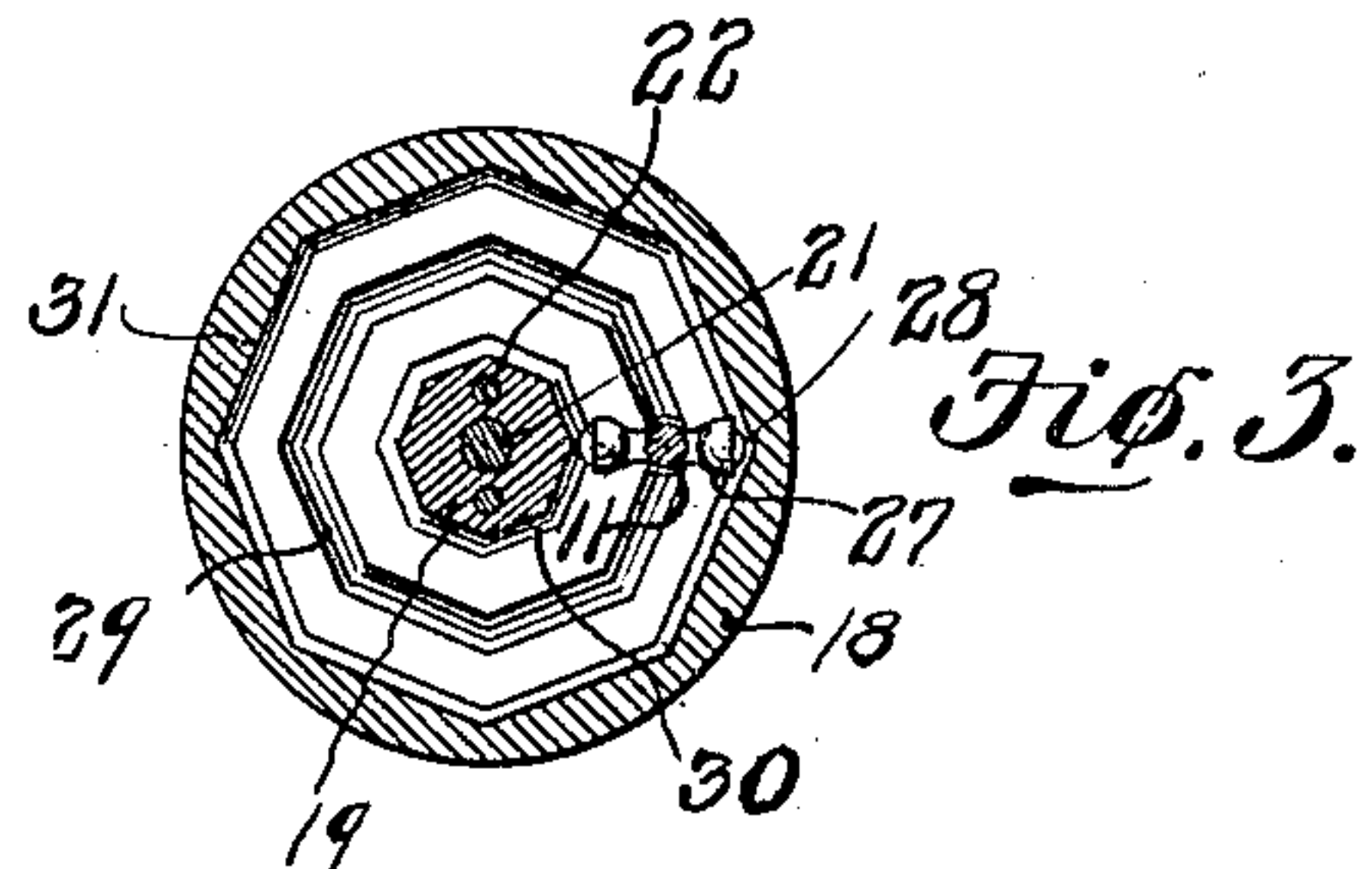
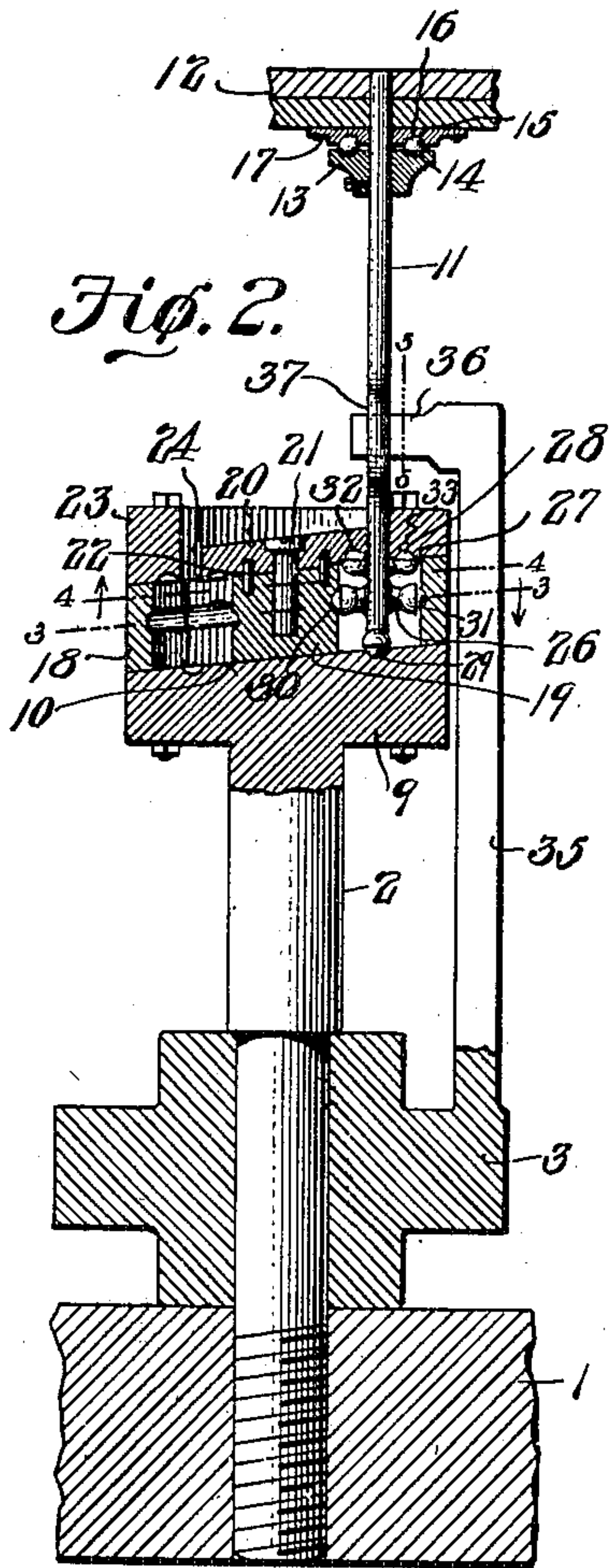
No. 825,793.

PATENTED JULY 10, 1906.

A. J. ARTHUR.  
SEPARATOR.

APPLICATION FILED JAN. 8, 1906.

2 SHEETS—SHEET 2.



WITNESSES:

*E. H. Hunt*  
*Wm. Bagger*

*Andrew J. Arthur*, INVENTOR.

By *C. A. Snow*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

ANDREW J. ARTHUR, OF SALEM, MISSOURI.

## SEPARATOR.

No. 825,793.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed January 6, 1906. Serial No. 294,942.

*To all whom it may concern:*

Be it known that I, ANDREW J. ARTHUR, a citizen of the United States, residing at Salem, in the county of Dent and State of Missouri, have invented a new and useful Separator, of which the following is a specification.

This invention relates to gyratory separators or sieves for cleaning, grading, and separating grain, bolting flour, and for all other purposes to which sieves, sifters, or separators of this class may be applied.

In machines of this class it is of great importance that the frame carrying the sieve or sifter be moved or operated in such a manner that its movement shall be subjected to sundry jerks or interruptions in order that the material supported upon the sieve may be thoroughly shaken or agitated in order to enable the finer particles to pass through the meshes of the sieve, thereby accomplishing the desired separation. Ordinary gyratory sieves are constructed primarily with this end in view, they having been found practically more efficient than sieves that are subjected to a near reciprocatory movement, for the obvious reason that a gyratory sieve is moved laterally as well as longitudinally, while an ordinary reciprocatory sieve is subjected to longitudinal movement only.

The object of the present invention is to increase the efficiency of the gyratory movement by first subjecting the movement to a continued series of interruptions, and, secondly, by combining the gyratory movement which takes place in an approximately horizontal plane with a vertically-reciprocatory movement, thereby greatly increasing the capacity for work and the general efficiency of the sieve or separator subjected to such movement. Other objects of the invention are to simplify and improve the construction and operation of this class of devices.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications

within the scope of the invention may be made when desired.

In the drawings, Figure 1 is a perspective view of a separator-frame embodying the invention. Fig. 2 is a vertical sectional view of one of the sieve-supports. Fig. 3 is a sectional view taken on the plane indicated by the line 3 3 in Fig. 2. Fig. 4 is a sectional view taken on the plane indicated by the line 4 4 in Fig. 2. Fig. 5 is a sectional view taken on the plane indicated by the line 5 5 in Fig. 2. Fig. 6 is a sectional detail view illustrating a modification.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

Upon a suitable base 1, which may be of any desired size and shape according to the size, shape, and character of the sieve or separator, there are supported four columns or uprights 2 2, which are preferably disposed at the four corners of a square or a rectangle. Upon the said uprights, near their lower ends, are journaled disks or pulleys 3 3, all of which are driven in the same direction, as by means of a belt 4, from a driving pulley 5, upon a shaft 6, which latter may be driven, as by means of a belt 7, from the source of power. (Not shown.) A tightening-pulley 8 may be provided for the purpose of keeping the belt 4 at the requisite degree of tension.

Upon the upper ends of the uprights 2 2 are supported disks 9, having beveled or sloping upper sides 10, it being understood that the upper sides or faces of the said disks are all sloped or inclined in the same direction. These disks support and afford tracks for the legs or supporting members 11 of the sifter-frame 12. The sieve or sifter does not appear in the drawings, inasmuch as it forms no part of the present invention; but it will be understood that a sieve, sifter, or separator of any desired character or construction may be used in connection with this device, and that such sieve, sifter, or separator is to be suitably supported upon or connected with the frame 12. It is desired, furthermore, to be understood that it is not necessary that the sifter-frame 12 be supported in a horizontal plane. It is frequently desirable to give to said frame a pronounced slant, and this may be readily accomplished by properly regulating the length of the legs or supporting members 11.

The upper ends of the legs or supporting members 11 have pivotal connection with



the frame 12, preferably at the four corners of said frame, so that they may serve in part to connect the members of which said frame is constructed. If desired, the supporting members 11 may be provided with collars 14, each of said collars having an annular groove 14, in which may be seated anti-friction-balls 15, engaging a groove or ball-race 16 in a collar or disk, as 17, upon the under side of the frame. These ball-bearings may, however, be dispensed with at the discretion of the builder of the machine.

Upon the upper sides of the disks 9 are secured annular bands 18, having inclined upper and lower faces, the upper faces of said bands being parallel to the inclined faces 10 of the disks 9. The inner sides or walls of said bands are polygonal and have in the drawings been illustrated as being octagonal, this being the preferred form. Upon the disks 9, within the bands 18 and concentric with the latter, are mounted blocks, as 19, which are polygonal, preferably octagonal, in cross-section, so that between the outer walls of the block 19 and the inner walls of the band 18 there will be formed a polygonal, in the present instance an octagonal, track or race. Upon each of the blocks 19 there is mounted a cap 20, which may be secured in position as by means of a screw 21 and dowels 22, said cap being polygonal in cross-section and extended beyond the walls of the block 19. A crown-band 23 is bolted or otherwise secured upon the upper edge of each of the bands 18, said crown-band being provided with inner polygonal walls overhanging the polygonal wall of the band 18 and corresponding with the latter. A slot or opening 24 of suitable dimensions is left between the polygonal walls or edges of the cap 20 and the crown-band 23, said slot being obviously of polygonal, and in the present instance of octagonal, shape.

The legs or supporting members 11 of the sieve-frame are extended through the slots 24 into the polygonal races, which are formed in the manner described at the upper ends of the uprights 2. Each of the legs or supporting members is provided with terminal divergent arms, as 26, which may be provided with sockets, as 27, in which are seated anti-friction-balls 28, the latter being adapted to engage grooves which may be formed for their reception in the upper faces of the disks 9, in the outer walls of the blocks 19, in the inner walls of the bands 18, and in the under sides of the caps 20 and of the crown-bands 23, said grooves being designated, respectively, 29, 30, 31, 32, and 33. In place of the sockets 27 and anti-friction-balls 28, however, ordinary anti-friction-rollers, as 34, may be used, as shown in Fig. 6 of the drawings, and when such rollers are used in place of the balls the grooves 29, 30, 31, 32, and 33 may be dispensed with.

Upon the upper faces of the disks or pulleys 3 there are supported posts or uprights 35, which are rigidly connected with said disks and which are provided at their upper ends with arms or brackets 36, extending into and engaging vertical slots 37 in the legs or supporting members 11.

The operation and advantages of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. When the device is in operation, the posts or uprights 35 will move orbitally around the casings comprising the members 9, 18, 19, 20, and 23 and which form or constitute the polygonal races for the legs or supporting members 11 of the sieve-frame. The blades or supporting members 11 are engaged by the arms or brackets 36 of the uprights 35 and are thereby carried around in the tracks or races, thereby imparting a gyratory movement to the sieve-frame supported by said legs or supporting members. Owing, however, to the polygonal shape of the races or tracks, the movement will be subjected to constant interruptions or jars, one interruption or jar occurring at each angle of the polygonal tracks, as will be readily understood. Consequently when octagonal tracks are used each orbit will be subjected to eight distinct interruptions occurring as the direction of movement is changed at the angles of the tracks. Nor is this all; but the legs or supporting members and the sieve-frame supported thereby will be additionally subjected to a vertically-reciprocatory movement by traveling up and down the inclined or sloping faces of the disks 9. This vertically-reciprocatory movement may be multiplied, if desired, by sloping or inclining the faces of the disks 9 in different directions.

Having thus described the invention, what is claimed is—

1. An approximately horizontal sieve-frame, supporting members for said frame, and polygonal tracks disposed in an approximately horizontal plane for said supporting members.

2. An approximately horizontal sieve-frame having supporting members, polygonal tracks disposed in an approximately horizontal plane for said supporting members, and means for engaging the supporting members and for moving them around the polygonal tracks.

3. A sieve-frame, supporting members pivotally connected therewith, polygonal tracks for said supporting members, and members moving orbitally around the tracks and engaging the supporting members to move the latter in the tracks.

4. A sieve-frame, supporting members pivotally connected therewith, polygonal tracks for said supporting members, members supported for orbital movement around the



tracks and having sliding engagement with the supporting members, and means for driving the orbitally-movable members.

- 5 5. A sieve-frame, supporting members pivotally connected therewith and having slots, inclined polygonal tracks for said supporting members, and members supported for orbital movement around the tracks and engaging the slots in the supporting members.
- 10 6. In a device of the class described, a plurality of uprights or supporting members, driven pulleys upon said uprights, disks supported at the upper ends of the uprights, polygonal bands and polygonal blocks supported
- 15 ed upon said disks, polygonal crown-bands and polygonal caps supported upon the bands and the blocks and spaced apart to form polygonal slots, a sieve-frame having supporting members extending through said slots and
- 20 provided with antifriction means engaging the adjacent walls, and members supported by and connected with the driven pulleys and

engaging the supporting members of the sieve-frame to carry the latter around the polygonal grooves or tracks.

- 25 7. In a machine of the class described, a plurality of casings having inclosed polygonal tracks or races and polygonal slots communicating therewith, a sieve-frame having supporting members extending through the
- 30 slots into the races and provided with divergent arms or brackets, antifriction members carried by said arms or brackets and engaging the walls of the races, and members supported for orbital movement and engaging
- 35 the supporting members of the sieve-frame to carry the latter around the tracks or races.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ANDREW J. ARTHUR.

Witnesses:

HIRAM L. HODGES,  
JOSEPH N. PARKER.