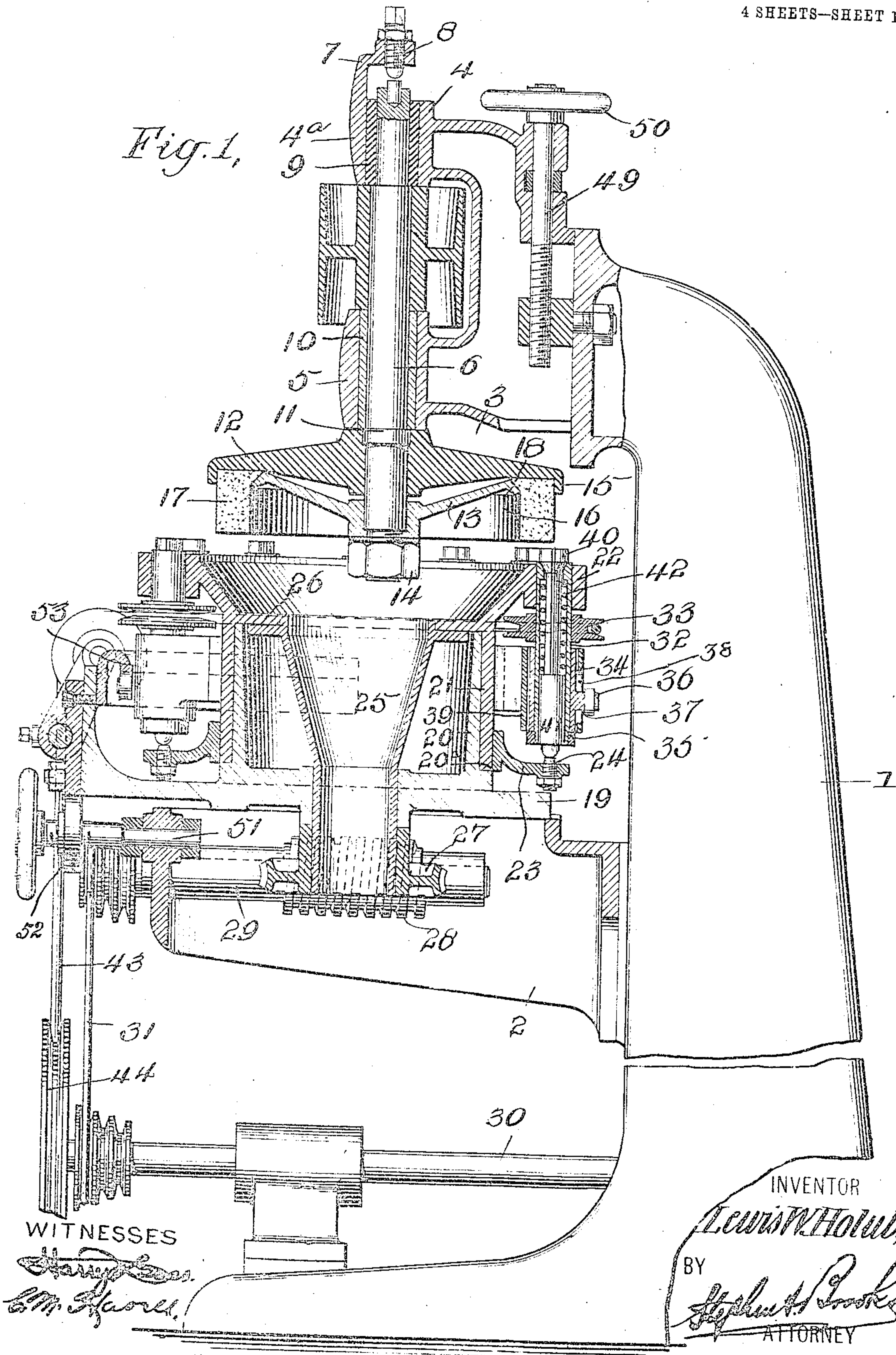


No. 816,550.

PATENTED MAR. 27, 1906.

L. W. HOLUB.  
GRINDING MACHINE.  
APPLICATION FILED APR. 18, 1904.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

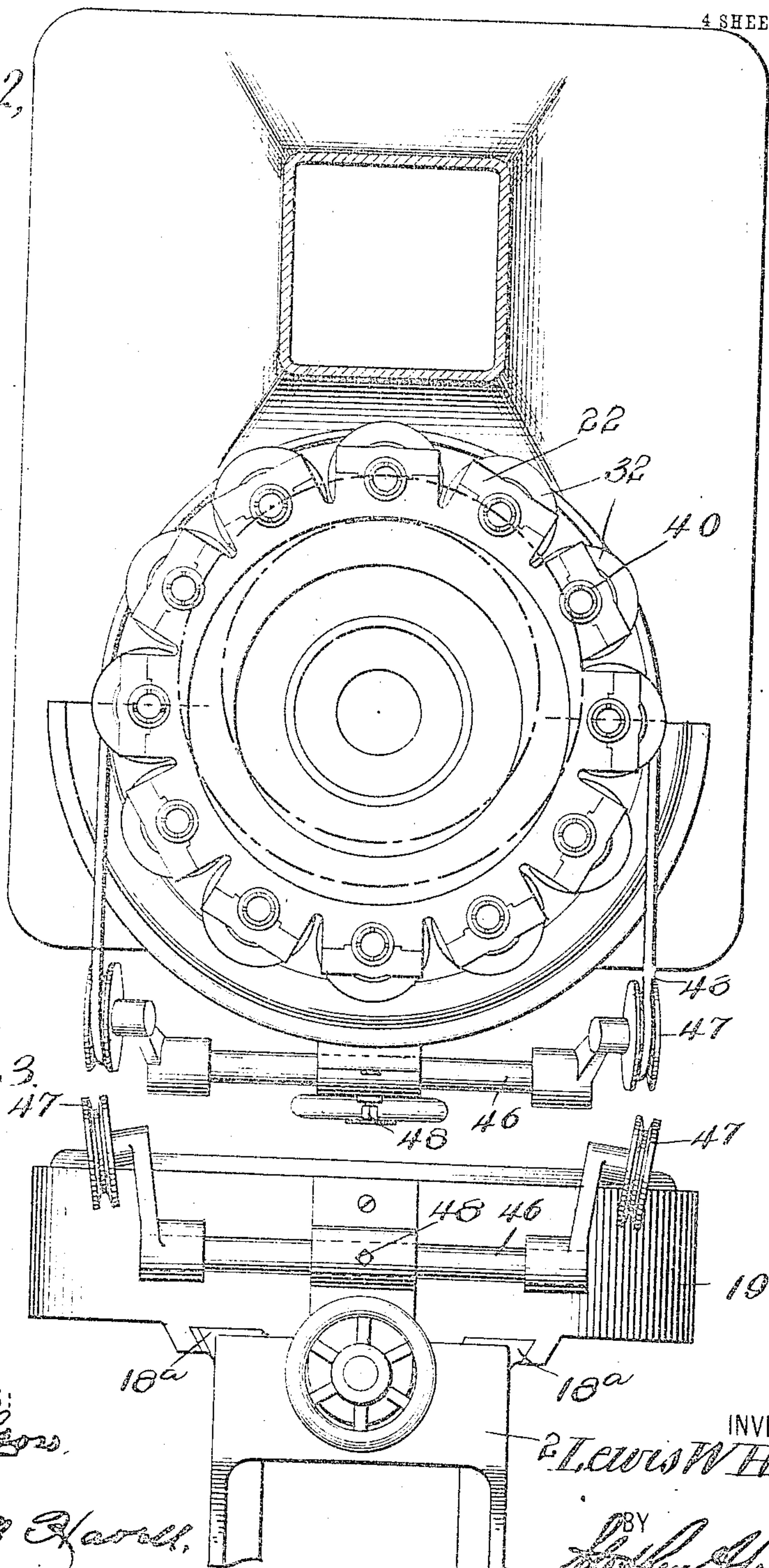
Fig. 2,

Fig. 4,

55

55

Fig. 3,



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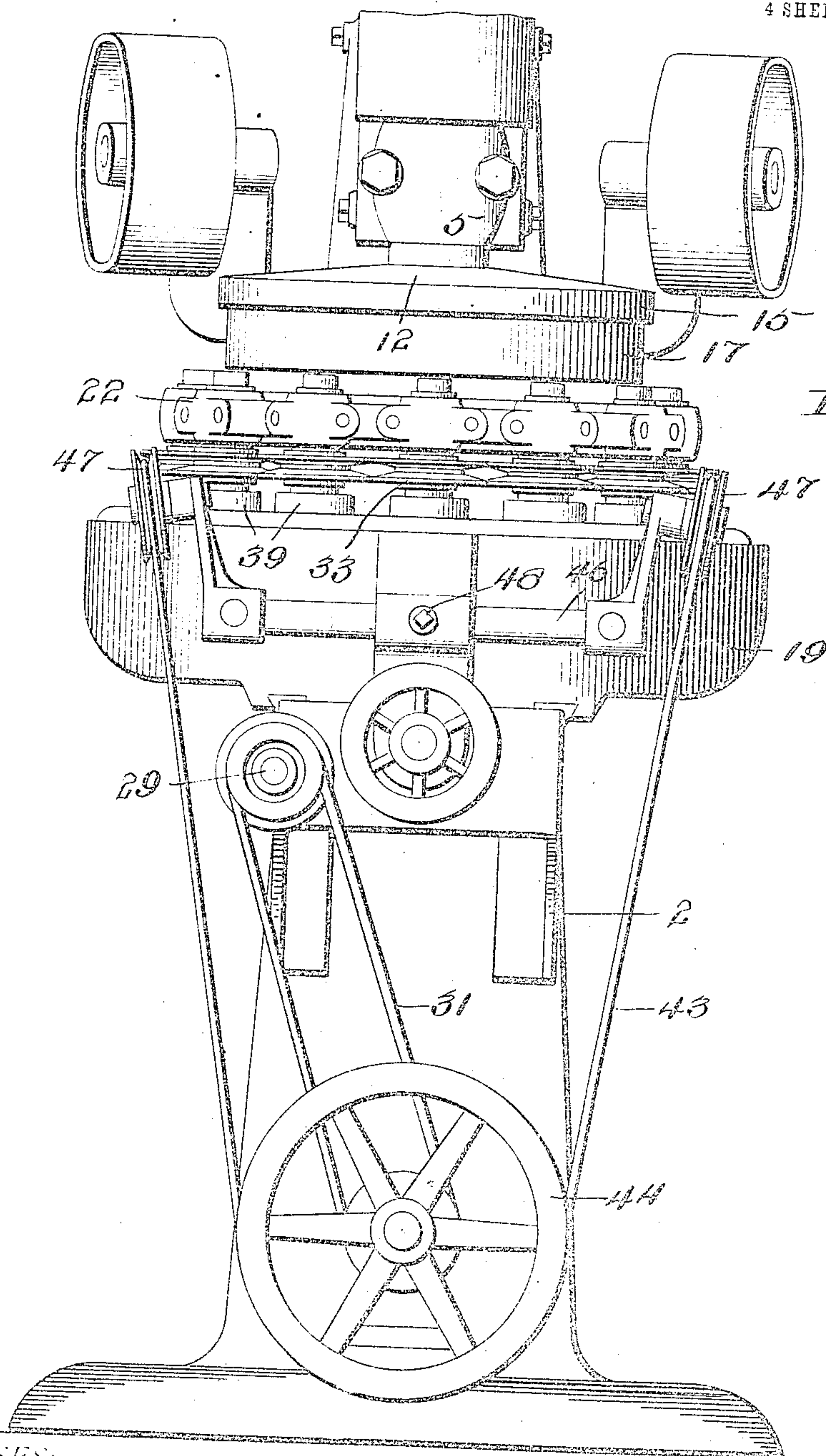


Fig. 5.

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4 SHEETS—SHEET 4.

Fig. 6.

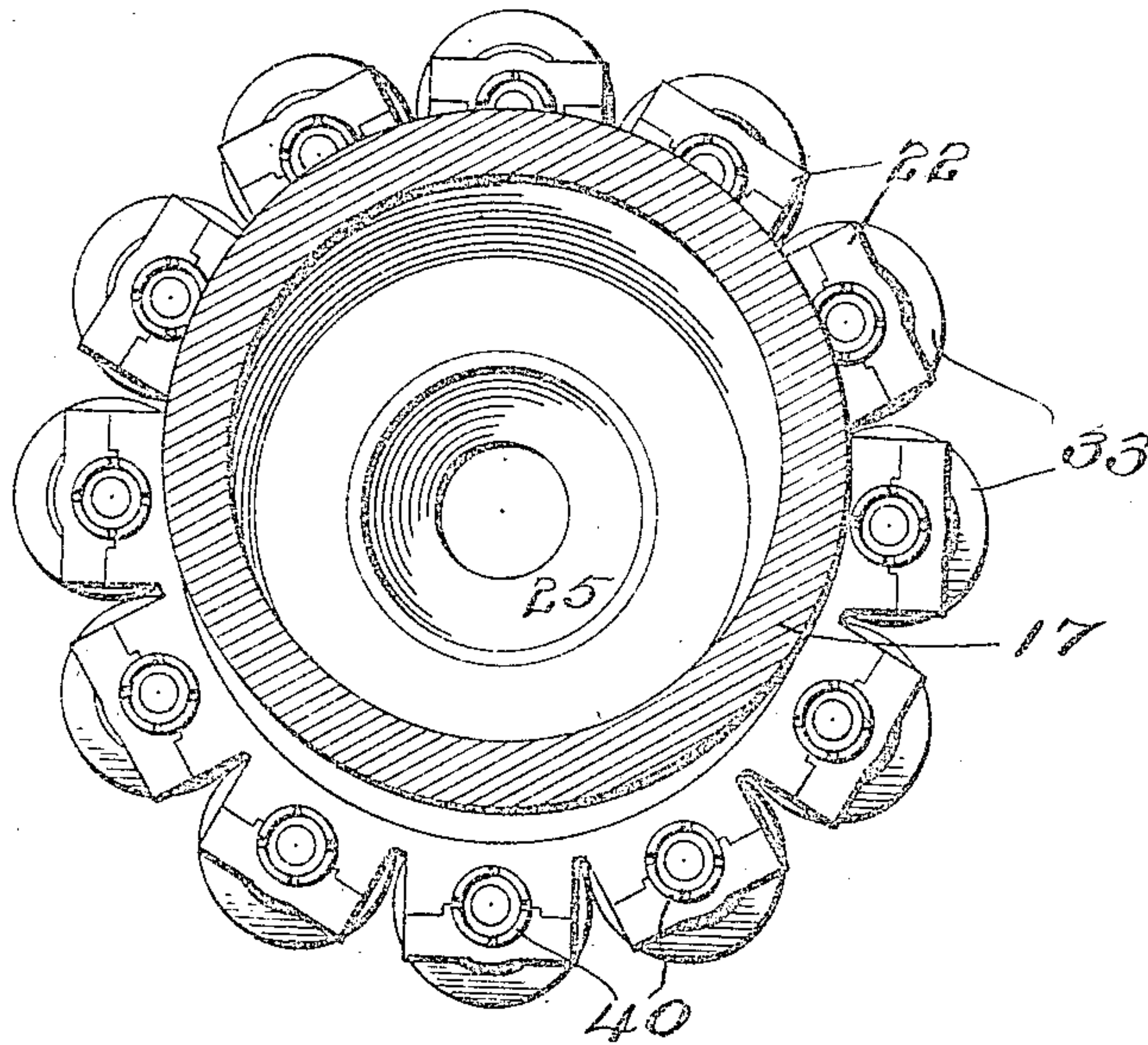
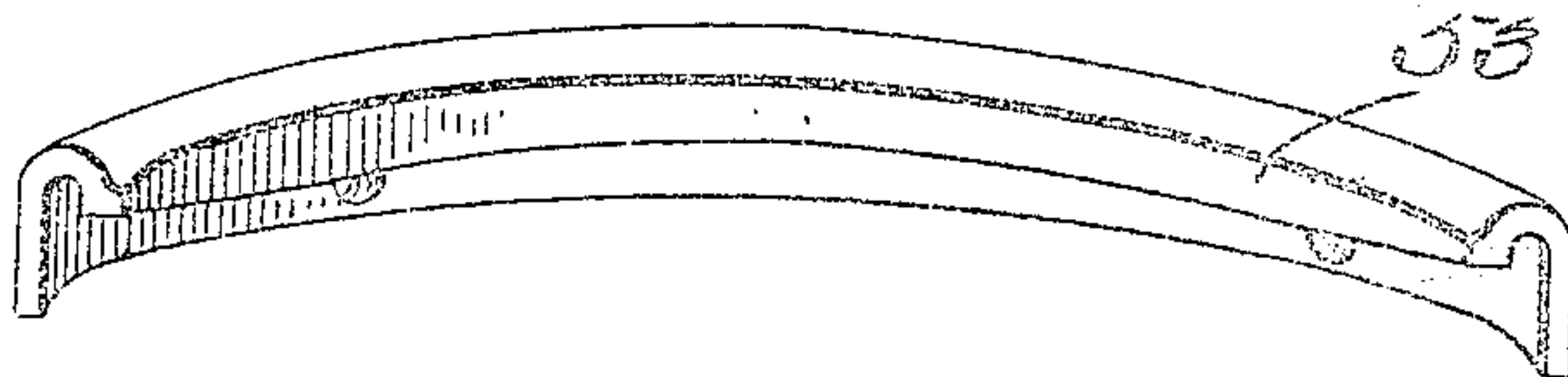


Fig. 7.



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# UNITED STATES PATENT OFFICE

LOUIS W. HOLUB, OF NEW YORK, N. Y.

## GRINDING-MACHINE.

No. 816,550.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed April 18, 1904. Serial No. 203,738.

*To all whom it may concern:*

Be it known that I, LOUIS W. HOLUB, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented new and useful Improvements in Grinding-Machines, of which the following is a specification.

My invention relates to improvements in grinding-machines, and has more particular reference to that type in which the primary object is the shaping of button-blanks to predetermined forms. It can be employed, however, for numerous other purposes, and, in fact, used in connection with any blanks having curved or flat surfaces and requiring a rotary grinding-ring in one of the steps of the finishing operations.

The primary object of my invention is the production of a mechanism which is comparatively simple in construction, embodying no complicated machinery, which is so easily rendered inoperative.

A further object is to provide an improved means for supporting the grinding-wheel, which means is adjustable to and from the work, thus making provisions for obvious defects due to the constant wearing of the ring. Further, I provide means for varying the eccentric path of travel of the chucks with relation to the grinding-ring, whereby the blanks to be ground will be subjected more or less to the action of the ring.

Other objects and advantages will be more specifically set forth in the following description and those features upon which I desire protection defined in the appended claims.

Broadly, the invention contemplates the provision of a plurality of chucks moving in a circular path and at a predetermined point moving beneath a revolving grinding-ring bearing an eccentric relation thereto, so that the blanks carried by the chucks will be subjected to a grinding action, the chucks at this point being rapidly revolved, and after the chucks pass out of contact with said ring they release the blanks and the rotation thereof ceases.

In the accompanying drawings, which form a part of this application, similar numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a view in side elevation and partly in vertical cross-section of my improvement. Fig. 2 is a view in top plan of the same, the grinding-ring and its mechanism being removed and the standard being

broken away. Fig. 3 is a view in front elevation of the sliding frame and the supporting-table therefor. Fig. 4 shows the finished button in top plan and side elevation, respectively. Fig. 5 is a view in front elevation of the entire machine with the exception of its extreme upper end, which is broken away. Fig. 6 is a detail view of the series of chucks which act in conjunction with the eccentrically-disposed grinding-ring, the latter being shown in section, and all cooperating mechanisms of the chucks and grinding-ring being removed. Fig. 7 is a view in perspective of the cam-track which is engaged by the rollers of the chuck-sleeves, so as to open the chuck-jaws and thereby release the button-blanks.

1 indicates a vertical frame-standard having a right-angular table or bracket 2 approximately midway of its height and at its upper end a vertically-adjustable bracket 3, formed with bearings 4 and 5. These bearings rotatably support the arbor 6, and the upper bearing, as will be observed by reference to Fig. 1, is provided with a removable section 4<sup>a</sup>, which carries an angular arm 7, provided with an adjustable threaded bearing-pin 8.

Within the bearing 4 I mount a bushing 9, which engages a circumferential shoulder on the arbor 6, and fixedly mounted on said arbor between the said bearings 4 and 5 is a pulley adapted to be driven by any suitable means. (Not shown.) A similar bushing, as 10, is also provided in the bearing 5, and at a point adjacent to the lower edge of this bushing the arbor 6 is formed with an annular flange 11, the function of which will be more clearly set forth in the following.

12 indicates an outer annular clamping-disk, and 13 an inner clamping-disk. These clamping-disks are arranged in concentric relation to each other and are formed with central openings, through which the arbor projects. The upper or outer disk 12 has a seat in the upper face encircling its opening, so as to receive the flange 11, which forms an abutment or stop for the said disk.

14 indicates a nut on the lower end of the arbor for forcing the disk 13 toward the disk 12, and by this movement, the said clamping-disks having the edge flanges 15 and 16, respectively, the horizontal grinding ring or wheel 17 is securely clamped therebetween. The particular disposition of these flanges differs slightly—that is, the flange of the disk



13 has its flange inclined so as to embrace the under inclined face of the inwardly-projecting ledge 18 of the grinding-wheel, while the flange of the disk 12 projects at approximately right angles to its disk.

On the table 2 is slidably mounted on the rails 18<sup>a</sup> a frame 19, which is provided on its upper face at a point beneath the arbor 6 with an integral annular hollow cylindrical portion 20, forming a track on which the chuck-carriage 21 is mounted to revolve. This carriage at its upper and lower portions is provided with a plurality of spaced-apart integral bearings 22 and 23, respectively, the lower bearings 23 carrying adjustable bearing-pins 24, all of which will be more specifically referred to in the following. The carriage comprises a cylindrical body portion having its lower end resting on an annular shoulder 20<sup>a</sup> of the track 20 and having its upper end flared to approximate funnel shape, whereby the buttons can be discharged from the rotary chucks to the chute 25 and thence to any receptacle arranged beneath the machine. At the base of this flared mouth is an integral inwardly-projecting flange 26, which bears on the upper edge of the track 20 and projects to a point within the same, whereby the chute can be fixedly connected thereto, as shown. The chute 25 projects below the frame and carries on its lower end a worm-gear 27, meshing with a worm 28 on a cross-shaft 29, journaled in the bracket 2.

30 indicates the drive-shaft, operated by any desired means, from which power is transmitted, as by an endless belt 31, to said shaft 29.

32 indicates the chuck-casings, carrying the fixed pulleys 33.

34 indicates sleeves loosely encircling the casings and bearing on the fixed casing-rings 35.

36 indicates rollers revolubly mounted on the stub-shafts or pins 37, secured to the sleeves 34 and which project through vertical slots 38 in the brackets or bearings 39, carried by the carriage 21.

Each chuck has a plurality of resiliently-supported jaws 40, the same being secured at their inner ends to a block 41, which is rotatably mounted on the underlying bearing-pin 24. Thus when the casing 32 is depressed through the medium of a cam-track, to be referred to hereinafter, engaging the roller 36 the conical seat in its upper end will be withdrawn from engagement with the conical exterior portion of the jaws, thereby allowing the jaws to expand, or, in other words, release the ground button-blank. Springs 42 are provided for returning the casings to their normal positions.

43 indicates an endless belt passing over a drive-pulley 44 and thence to the chuck-pulleys 33. In order to give the desired tension to this belt, I provide a suitable means in the

form of a rock-shaft 46, on the ends of which are journaled sheaves 47 and over which the belt 43 passes. This shaft is preferably held in its adjusted position by any suitable means—for instance, a set-screw 48.

49 indicates a screw-shaft having the hand-wheel 50, through the medium of which the bracket 3 can be adjusted. 51 indicates another screw-shaft threaded in the ear 52 of the frame 19 and having its inner end swiveled in the table 2.

In operation the carriage 21 is revolved slowly by the worm and worm-gear mechanism heretofore described, and the chucks which are engaged by the belt 43 are rapidly revolved, so that the entire outer portion of one face of the blank is subjected to the action of the grinding-ring. (See Fig. 2.) The grinding-ring 17 is of smaller diameter than that of the circle described by the series of chucks and is eccentrically disposed thereto whereby the button-blanks contained in the chucks will only be engaged by said grinding-ring when the carriage 21 is rotated. After the chucks have passed out of contact with the belt 43 the rollers 36 thereof engage a cam-track 53, so that the chuck-casings 32 are lowered and the chuck-jaws thereby allowed to spring apart, and thus releasing the ground button-blanks. These button-blanks when thus ground are formed with a central stud 55. (See Fig. 4.) I employ any desired means to remove the blanks from the chucks; but I prefer to use pneumatic means, for which I intend to make separate application for patent. In the present application I make no claim to the chuck *per se*, as a separate application has been filed thereon, the same bearing Serial No. 193,899. After the finished blanks are removed other blanks are substituted therefor, and the grinding operation then proceeds, as previously indicated.

By the construction described as the grinding-ring becomes worn I can readily lower the same to make up for such wear. Further, the frame 19 can be adjusted to vary the amount of blank-surface subjected to the action of the grinding-ring so as to increase or decrease the diameter of the stud 55, and, finally, it will be observed that by the belt 43 simultaneously engaging only a portion of the series of chucks the remaining are not being rotated and are not again rotated until the finished blanks have been removed and new ones substituted therefor. Thus it will be apparent that as the chucks are not being rotated when the blanks are being removed and placed in position this operation is greatly facilitated.

In the present application I have described a construction which will operate to advantage in the manner specified and accomplish the many purposes and objects to which it is assigned; but I do not desire myself restricted to the detailed construction thereof ex-



cept as indicated in the appended claims, as it will be obvious that numerous alterations can be made without materially affecting the operation of the machine and without departing from the spirit of the invention.

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

1. In a grinding-machine of the type set forth, a plurality of chucks, means for moving them in an endless course, a grinding means eccentrically disposed thereto, means for adjusting the grinding means in a vertical plane, and means for adjusting the chucks in a horizontal plane.

2. In combination a rotary grinding means, a frame slidable laterally with relation to the axis thereof, rotary chucks supported by said frame and being eccentrically disposed with relation to said grinding means, means for successively bringing said chucks beneath said grinding means, and means for rotating said chucks at such point of their travel.

3. In combination with a frame provided on its upper face with a cylindrical track, a carriage having its lower portion embracing the said track, a chute extending through said track and being secured to said carriage, chucks carried by said carriage, means for operating said chucks, and means for operating said carriage coöperating with the means carried by the chute.

4. In combination with a standard, a grinding-ring adjustably mounted on the upper portion thereof, a table slidable laterally relative to the axis thereof, chucks supported on said table, means for moving them in an endless course, means for rotating said chucks only at the point when beneath the grinding-ring.

5. In a machine of the type set forth, a track, a carriage into which the track pro-

jects, a flange formed integral with the carriage and engaging the upper edge of the track, a chute secured to said flange, means for operating said carriage, and chucks rotatably mounted on said carriage in combination with means for driving the same.

6. In a machine of the type set forth, a table formed with a cylindrical track projecting upwardly from its upper face, said track being formed with an external annular shoulder, a carriage embodying a cylindrical body portion telescoping said track and having its lower edge resting on the annular shoulder thereof, an internal flange secured to said carriage and resting on the upper edge of said track, a chute secured to said flange, and means for rotating said carriage.

7. In a machine of the type set forth, a standard, a rotating carriage thereon, chucks carried by said carriage, said chucks embodying reciprocating casings, and spindles having jaws open and closed by the movement of said casings, means on said carriage forming a bearing for the lower end of said spindles means for rotating said chucks at a predetermined point of travel, and means on said standard partially embracing said carriage for reciprocating said casings after the chucks have passed the aforementioned point.

8. In combination, a standard formed with a table, a carriage-support laterally mounted thereon, a carriage rotatably mounted on said support, chucks carried thereby, a chute extending downwardly from the carriage, a gear secured to said chute, means engaging said gear for rotating said carriage, and means for reciprocating said carriage-support.

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