

No. 864,791.

PATENTED SEPT. 3, 1907.

J. S. LUCOCK.  
GRINDING MACHINE.  
APPLICATION FILED FEB. 14, 1907.

3 SHEETS—SHEET 1.

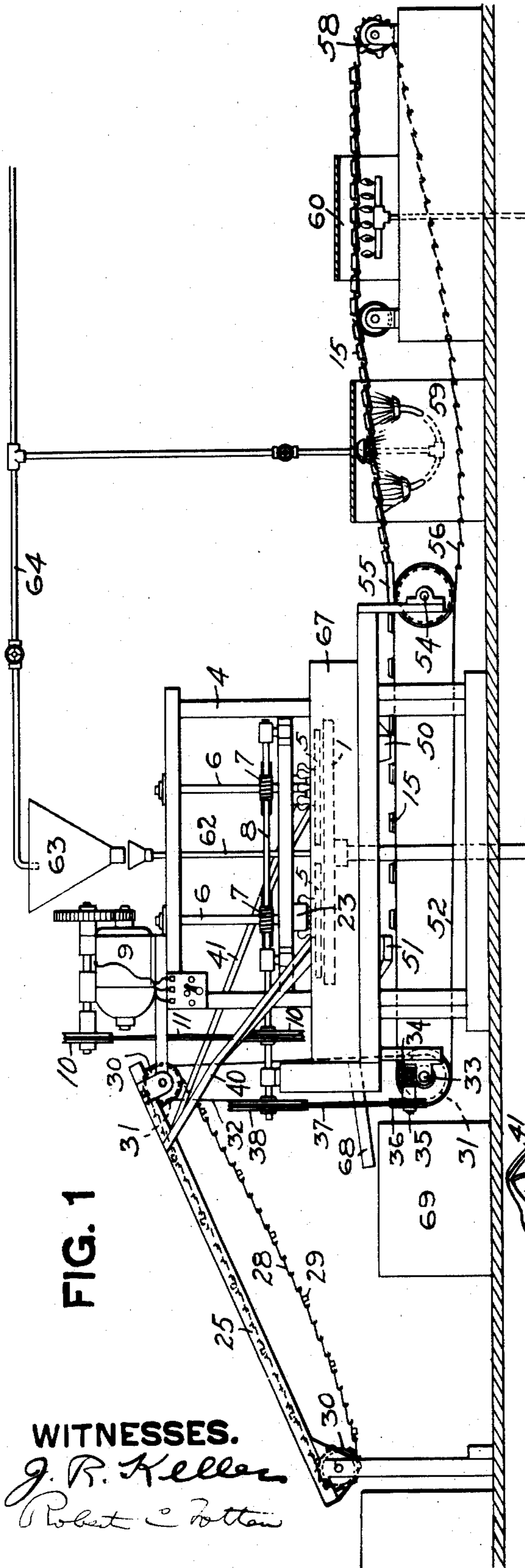


FIG. 1

WITNESSES.

J. R. Keller  
Robert C. Fottan

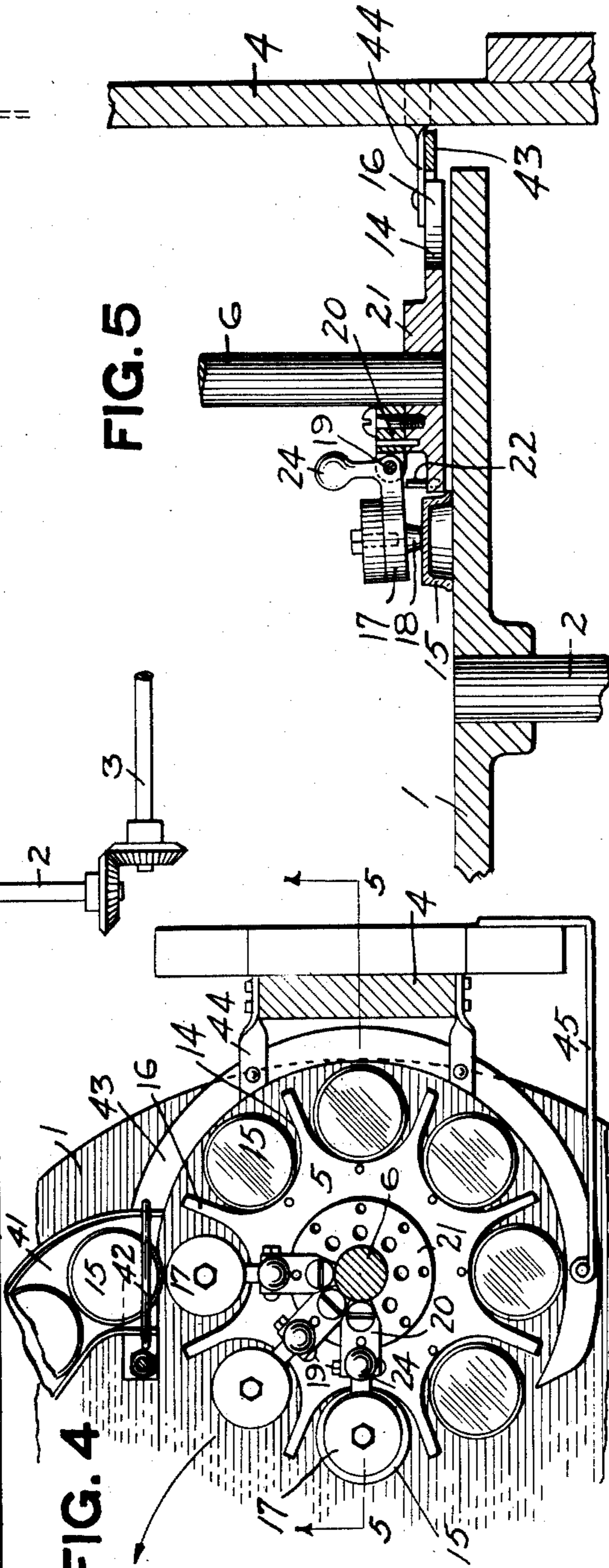


FIG. 5

FIG. 4

INVENTOR.

John S. Lucock  
By Ray Fottan & Winter  
attorneys

J. S. LUCOCK.  
GRINDING MACHINE.

APPLICATION FILED FEB. 14, 1907.

3 SHEETS—SHEET 2.

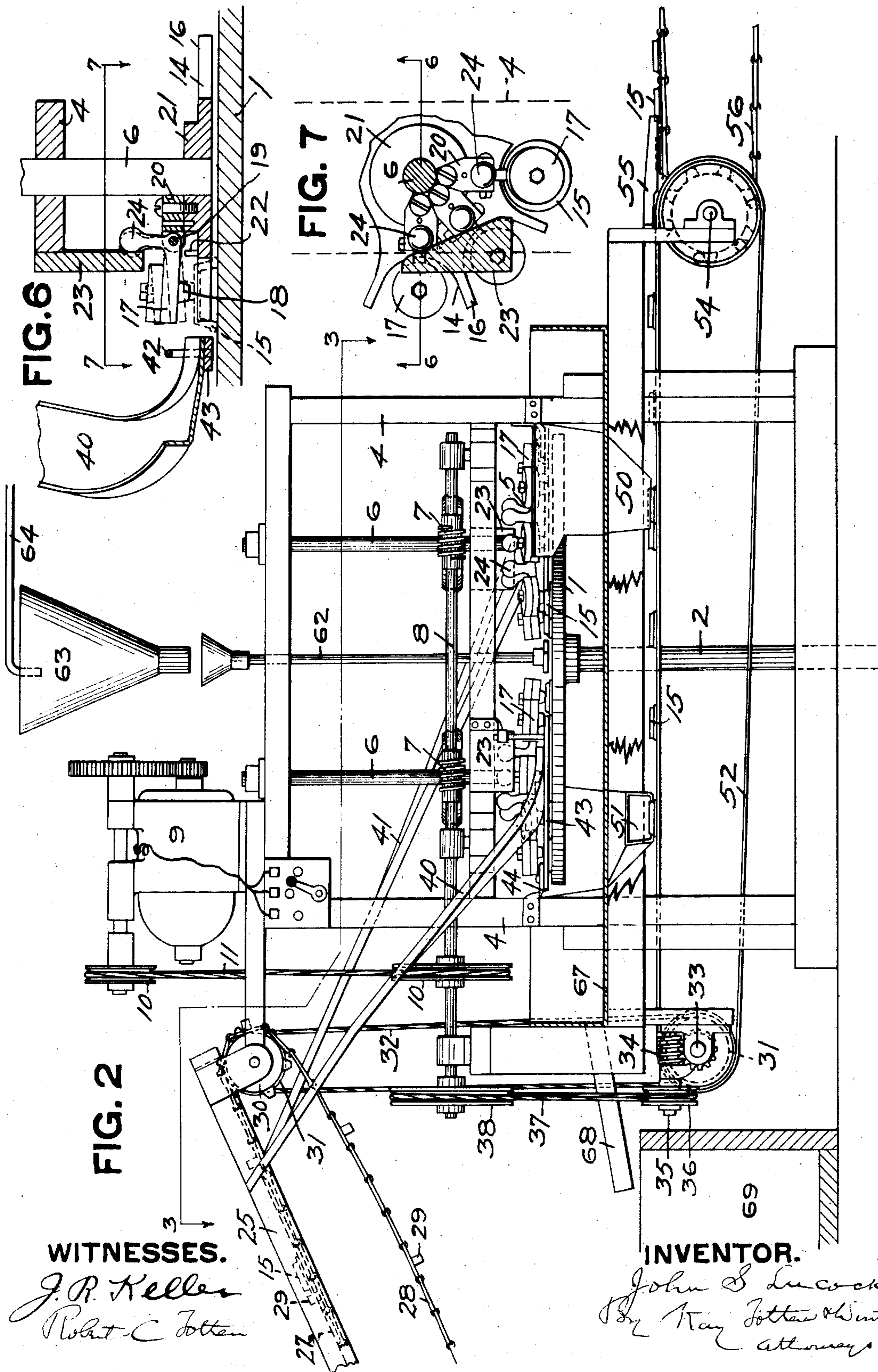


FIG. 2

FIG. 7

FIG. 6

WITNESSES.

J. R. Keller  
Robert C. Follen

INVENTOR.

John S. Lucock  
By Ray Follen & Winter  
Attorneys

No. 864,791.

PATENTED SEPT. 3, 1907.

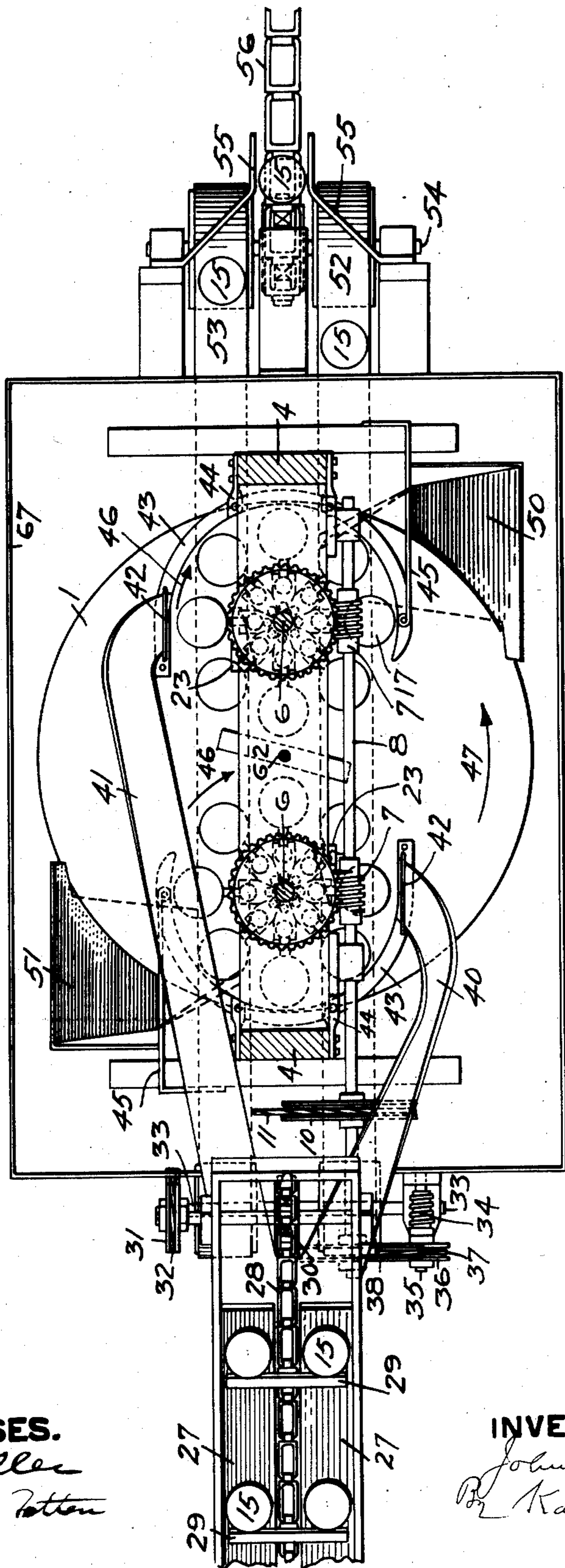
J. S. LUCOCK.

GRINDING MACHINE.

APPLICATION FILED FEB. 14, 1907.

3 SHEETS—SHEET 3.

FIG. 3



WITNESSES.

J. R. Keller  
Robert C. Follen

INVENTOR.

John S. Lucock  
By Kay Follen & Winter  
Attorneys

# UNITED STATES PATENT OFFICE.

JOHN S. LUCOCK, OF WASHINGTON, PENNSYLVANIA.

## GRINDING-MACHINE.

No. 864,791.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed February 14, 1907. Serial No. 357,420.

*To all whom it may concern:*

Be it known that I, JOHN S. LUCOCK, a resident of Washington, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Grinding-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to grinding machines and more especially to machines for grinding small glass articles.

In the drawings the machine has been shown especially adapted for grinding glass caps for fruit jars, but obviously the machine can be adapted for grinding various other glass or similar articles.

The object of the invention is to provide a machine for the purpose specified having a large capacity and operating entirely automatically, it merely being necessary to place the articles to be ground upon a conveyer which takes them to the machine, the latter having automatic article-feeding mechanism, automatic means for holding the article while being ground and for releasing the same when ground, and also automatic mechanism for delivering the ground article from the machine.

The invention comprises the arrangement and combination of mechanisms hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation partly in section showing the entire machine and connected appliances; Fig. 2 is a side view of the grinding machine proper on an enlarged scale; Fig. 3 is in part a plan view and in part a horizontal section of said machine; Fig. 4 is a horizontal section showing one of the grinding heads and grinding disk in plan and on an enlarged scale; Fig. 5 is a vertical section taken on the line 5-5, Fig. 4; Fig. 6 is a detailed sectional view through the delivery end of one of the feeding spouts; and Fig. 7 is a horizontal section on the line 7-7, Fig. 6.

The grinding machine comprises a horizontal rotating grinding disk 1, secured to a vertical shaft 2, which may be driven from any suitable source of power, such as from the shaft 3, underneath the floor, the disk and shaft 2 being mounted in a suitable frame 4. Co-operating with the disk is or are one or more article holding or grinding head or heads 5, two such heads being shown, one on either side of the axis of the grinding disk. These heads are mounted on vertical shafts 6, which are rotated slowly by suitable mechanism, such as by means of a worm gearing 7, connected to a horizontal shaft 8, which is driven from any suitable source, such as from a motor 9, mounted at any suitable point on the framing, and connected to the shaft 8 by means of sheaves or pulleys 10 and belt 11.

The grinding heads 5 are provided with peripheral recesses or notches 14 for receiving the articles to be

ground, the latter being shown as glass jar caps 15. The projecting arms or fingers 16 between the recesses 14 serve to move the article being ground over the face of the grinding disk if the ordinary holding means is not sufficient for this purpose. The article being ground is held against the face of the grinding disk by suitable pressure applying means, such as a weighted body 17, provided with a central teat, or projection 18, which bears centrally upon the article being ground, thus giving uniform pressure at all points of the periphery of said article. The weighted body may be mounted in any suitable way to be brought into and taken out of engagement with the article being ground. As shown, said body is pivoted at 19 to a member 20, secured to the hub 21 of the grinding head 5. A pin or projection 22 is provided to limit the downward movement of the weighted body, so as to prevent the latter from coming in contact with the grinding disk when there is no article in the machine. Suitable means are provided for automatically raising and lowering the weighted body 17 in order to receive an article to be ground, and also to permit its removal or discharge. The means shown for this purpose is a stationary cam 23 suitably secured to the frame and arranged to be engaged by an arm 24 on the weighted body. It is obvious that in the rotation of the grinding head the weighted body 17 will remain in its lowermost position except when said body is being carried past the stationary cam 23, when said body will be elevated. During this period the ground article is discharged and a new article fed underneath said weighted body.

I provide automatic article-feeding means, the same comprising a conveyer 25, which, in effect, is a twin or double conveyer, it having two inclined boards or other article supporting members 27, between which is a chain 28 carrying cross arms or bars 29, which project over the two members 27, and thus carry two articles side by side, as shown in Fig. 3. The chain 28, at its two ends passes over suitable guide wheels or sprockets 30, and it can be driven in any suitable way. As shown, the shaft of the upper guide wheels or sprockets is provided with a pulley or sheave 31, which is connected by a chain or belt 32 with a similar wheel on a horizontal shaft 33. The latter is connected by worm gearing 34 to a short shaft 35, provided with a pulley or sheave 36 which is connected by a belt or chain 37 to a similar pulley or sheave 38 on the shaft 8. As a consequence, the chain 28 is given a slow continuous movement, carrying upwardly two articles side by side.

From the upper ends of the members 27, the articles are conducted to the grinding heads by means of a pair of spouts or chutes 40 and 41, one of these leading to one of the grinding heads and the other leading to the other grinding head, but on the opposite side of the machine. The articles slide down these chutes or spouts and in operation said spouts will be practically full of

a line of articles to be ground. At the lower ends the spouts are provided with cross bars 42 to prevent the bottom article from being lifted by the weight of the column behind the same. Whenever an empty space 5 14 in the grinding head comes opposite the end of its spout or chute, the article will be pushed by the weight of the column behind the same into said recess, the weighted body 17 at that moment being elevated to permit the admission of the article. As soon as the 10 head has moved forwardly a short distance, the arm 24 passes beyond the cam 23 and consequently the weighted body drops upon the article and holds the same against the face of the grinding disk and causes said article to be carried around with the grinding head.

15 A curved guard 43 encircles about half of the head, it being supported in any suitable manner, such as by the arms 44 and 45. This guard prevents the escape of the article being ground. The articles are not released from the weight 17 until they have nearly completed an entire circle, when said weight is lifted by 20 the arm 24 coming into contact with the front end of the cam 23. The grinding heads rotate in the direction of the arrows 46, this movement being a comparatively slow one, while the grinding disk 1 rotates in the opposite direction, as indicated by the arrow 47 and at a 25 comparatively high speed. Consequently as soon as the article is released from the restraint of the weighted body 17, it moves outwardly by centrifugal force, and is discharged over the edge of the grinding disk.

30 The articles from the two grinding heads are discharged in opposite directions, and at two diametrically opposite points are receiving hoppers, 50 and 51 respectively, into which the articles are centrifugally discharged. These hoppers have discharge openings 35 leading to the two conveyers, 52 and 53, which are in the form of belts passing over suitable pulleys at their ends, the pulleys at one end being mounted on the driven shaft 33, while those on the opposite end are secured to a horizontal shaft 54. The articles are deposited one by 40 one upon these belts and are carried by the same toward one end of the machine. Here they encounter the inclined stationary guards or bars 55 by means of which they are pushed sidewise upon a conveyer, such as a chain 56, located between the belts 52 and 53, said 45 chain at one end passing over a suitable sprocket wheel on the shaft 54, and at its opposite end over a similar guide wheel 58. This chain carries the articles first through a spraying chamber 59 where the articles are sprayed both from above and below, and then through 50 a suitable drying chamber 60, where the articles are dried and are then ready for delivery.

The grinding disk 1 will be supplied with a mixture of sand and water or other suitable abrading mixture, this being supplied by the centrally located pipe 62 55 supplied from an overhead vessel 63 and water pipe 64, its lower end lying in close proximity to the surface of the grinding disk, so as to discharge the abrading mixture onto the disk. Underneath the grinding disk is a pan 67 to catch the water, abrading material and glass 60 which is removed, said pan being provided with a discharge spout 68, leading to a tank 69.

The apparatus described is entirely automatic in its operation, it merely being necessary for a boy or other attendant to place the articles upon the conveyer 25. 65 The articles are automatically delivered to the two

grinding heads; automatically engaged by the weights 17 and carried slowly around while being ground; automatically released from said weights; removed from the grinding disk automatically by centrifugal action; and by automatic mechanism are delivered 70 from the machine and pass through the washing and drying chambers. They can either be taken by hand off the chain 56, or may be discharged by the latter in any suitable way. The apparatus requires a minimum of attendance and has a very large output, being de- 75 signed to grind a large number of articles per minute.

While the machine has been described particularly for grinding glass articles, such as glass jar caps, it will be understood that it can be equally as well used for grinding any vitreous, or for that matter, metal articles. 80

What I claim is:—

1. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head co-operating therewith, a weighted article holding member pivoted to the head and provided with an arm, and a cam 85 in the path of said arm and arranged to elevate said weighted member to permit the article to enter and to be released.
2. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head co-operating therewith, a weighted article engaging member 90 pivoted to the head, an abutment arranged to contact with said member and limit its downward movement, and means for elevating said weighted member to permit the article to enter and to be released. 95
3. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head co-operating therewith, a weighted article engaging member pivoted to said head and provided with an arm, a cam in the path of said arm arranged to elevate the weighted member to permit the article to enter and to be released, 100 and an abutment against which said member contacts and arranged to limit the downward movement thereof.
4. In a grinding machine, the combination of a horizontal rotating grinding head, an article holder co-operating therewith and comprising a pressure member having a 105 teat or projection to engage the article centrally.
5. In a grinding machine, the combination of a horizontal rotating grinding disk, a weight co-operating with said disk and provided with a central teat or projection 110 to engage the article centrally.
6. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head co-operating therewith, a weighted article engaging member carried by the head and provided with a central teat or 115 projection to engage the article centrally, and means for elevating said weighted member to permit the article to enter and to be released.
7. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head co-operating therewith, a vertically movable article holder 120 carried by said head, a feed spout at one side of said head, and means adjacent to said feed spout for elevating said article holder.
8. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head co-operating therewith, a weighted article holder carried by 125 said head, said head being provided with recesses, a curved guard extending along the periphery of said head, a feed spout at one end of said guard, and a stationary cam arranged to elevate said weighted article holder. 130
9. In a grinding machine, the combination of a horizontal rotating grinding disk, an article holding device at one side of the axis of said disk, means for releasing the article, and means for rotating the disk whereby the article 135 when released is discharged centrifugally.
10. In a grinding machine, the combination of a horizontal rotating grinding disk, an article holding device at one side of the axis of the disk, a hopper arranged at the periphery of the disk, means for releasing the article from 140 the holder, and means for rotating the disk, whereby the

article when released is discharged centrifugally into said hopper.

11. In a grinding machine, the combination of a horizontal rotating grinding disk, an article holding device at one side of the axis of the disk, automatically arranged mechanism for causing said holder to engage and disengage the article, and means for rotating the disk, whereby the article when released is discharged centrifugally.

12. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head arranged at one side of the axis of the grinding disk, means carried by the head for engaging and releasing the article, and mechanism for rotating the disk, whereby the article when released is discharged centrifugally.

13. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head arranged on one side of the axis of said grinding disk, means carried by said head for engaging and releasing the article, a supply spout leading to the grinding head, and mechanism for rotating the grinding disk, whereby the articles when released are discharged centrifugally.

14. In a grinding machine, the combination of a grinding disk, an article holder, feeding mechanism, delivery mechanism, and automatically acting article releasing mechanism.

15. In a grinding machine, the combination of a grinding disk, a cooperative article holder, a feeding conveyer, a spout leading from the same to the article holder, and article delivery mechanism.

16. In a grinding machine, the combination of a horizontal rotating grinding disk, a rotating grinding head cooperating therewith, automatically article holding and releasing mechanism carried by said head, automatically acting feeding mechanism for supplying the articles to said head, and automatically acting delivery mechanism.

17. In a grinding machine, the combination of a horizontal rotating grinding disk, two grinding heads cooperating therewith, a feeding mechanism leading to each head, one on either side of the machine, two delivery means for each head, one located on either side of the machine.

18. In a grinding machine, the combination of a horizontal rotating grinding disk, plural feeding conveyers, plural spouts leading therefrom and leading to opposite sides of the disk, plural movable article holders, and receiving hoppers arranged on opposite sides of the disk.

19. In a grinding machine, the combination of a horizontal rotating grinding disk, plural movable article holding and releasing device cooperating therewith, plural feeding mechanisms for conveying the articles to said holders, and plural delivery mechanisms.

20. In a grinding machine, the combination of a horizontal rotating grinding disk, article holding and releasing means cooperating therewith, receiving hoppers located on opposite sides of the machine, a pair of conveyers leading from said hoppers, and a single conveyer upon which both of said first named conveyers discharge.

21. In a grinding machine, the combination of a horizontal rotating grinding disk, article holding and releasing devices cooperating therewith, a pair of parallel conveyers for delivering the articles from said machine, inclined abutments in the path of the articles carried by said conveyer, and a single conveyer for receiving the articles discharged from the conveyers by said abutments.

In testimony whereof, I the said JOHN S. LUCOCK have hereunto set my hand.

JOHN S. LUCOCK.

Witnesses:

F. W. WINTER,  
M. D. VOGEL.