No. 863,066. PATENTED AUG. 13, 1907.

L. HOLLAND-LETZ.

GRINDING MILL.

APPLICATION FILED JUNE 15, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

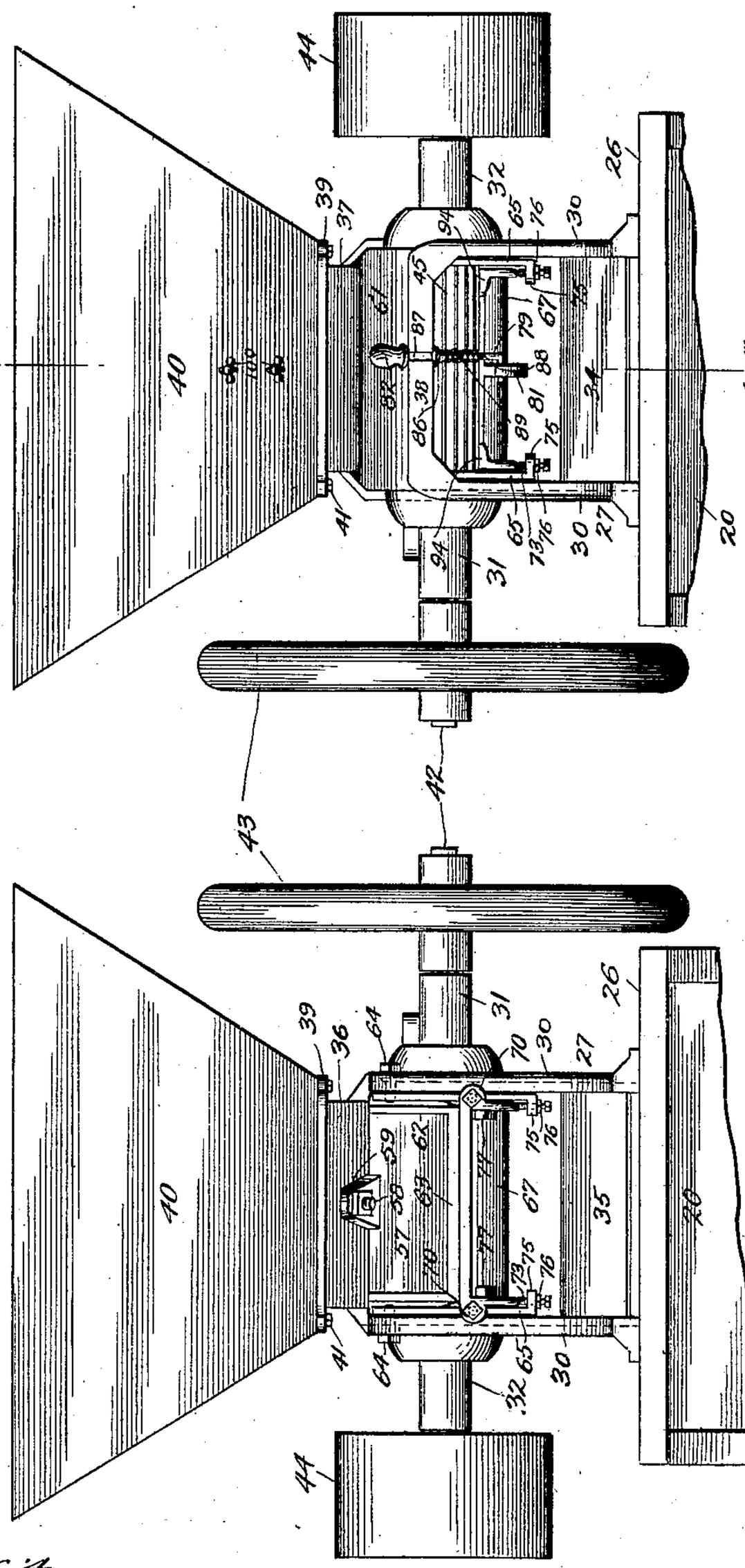

Fig. 2.

Fig. 9.

Fig. 8.

Fig. 7.

Witnesses:
Harry A. Lubitz
Ray White.

Inventor:
Louis Holland-Letz,
By John Howard McElroy
Atty.

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3 SHEETS—SHEET 2.

Fig. 3.

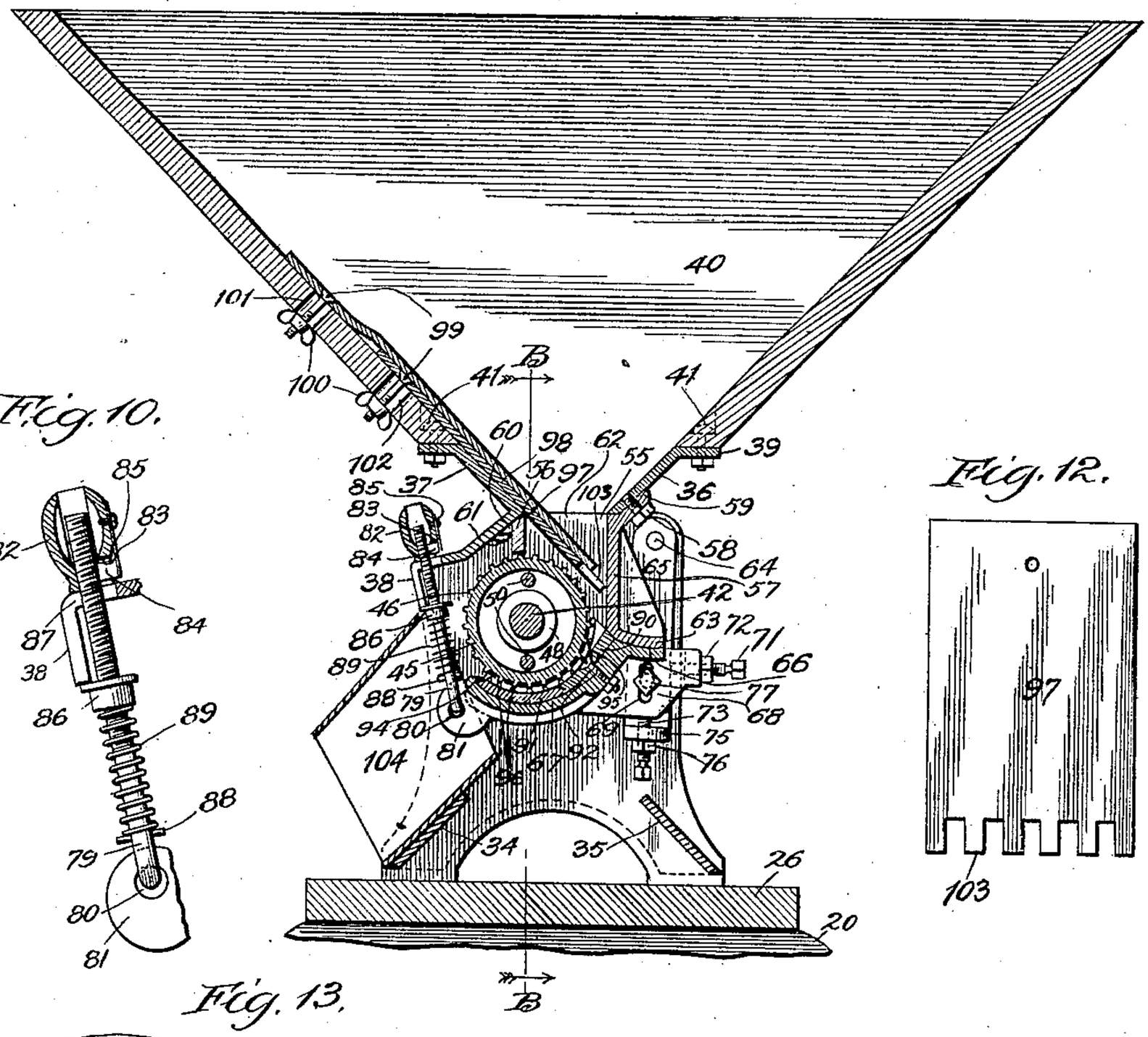


Fig. 10.

Fig. 12.

Fig. 13.

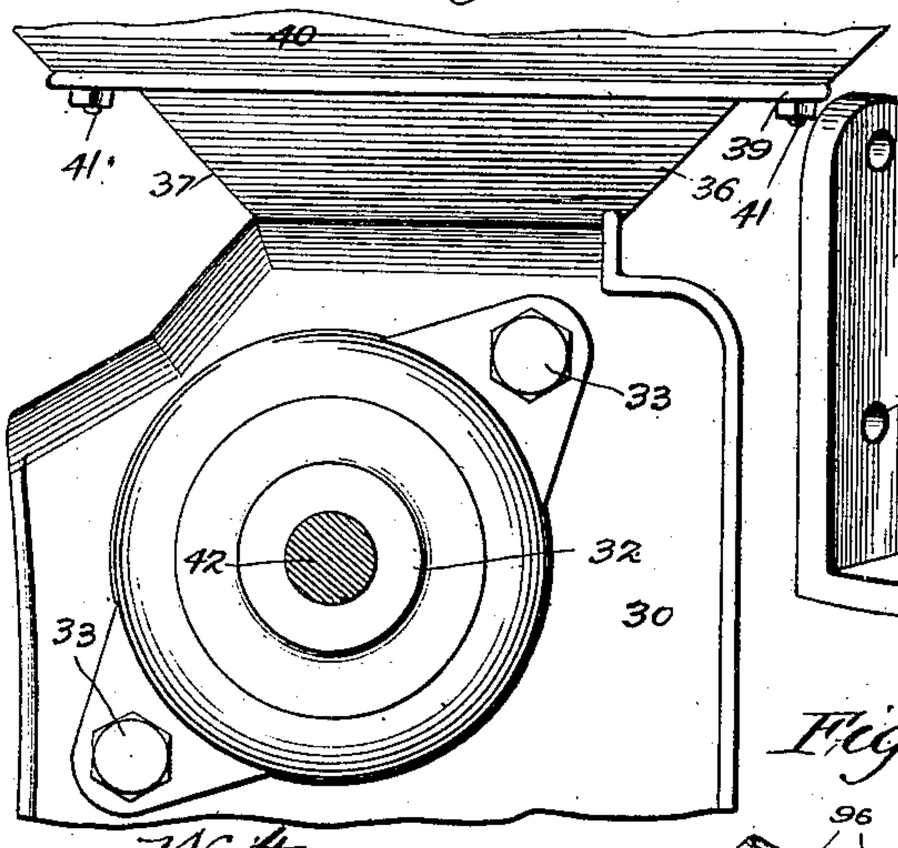


Fig. 11.

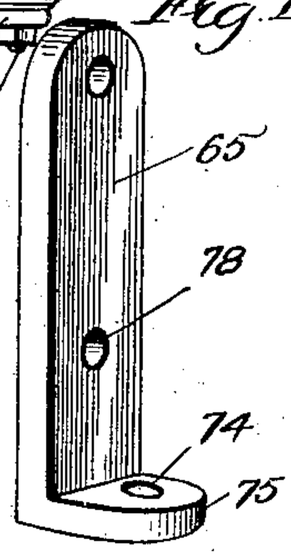


Fig. 14.

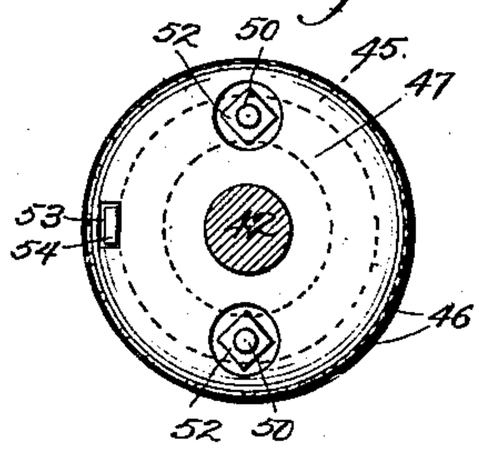
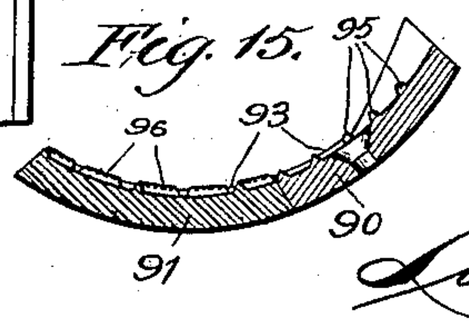


Fig. 15.



Witnesses:
Harry R. Lubcke
Ray White.

Inventor:
Louis Holland-Letz,
By John Howard McElroy
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3 SHEETS—SHEET 3.

Fig. 4.

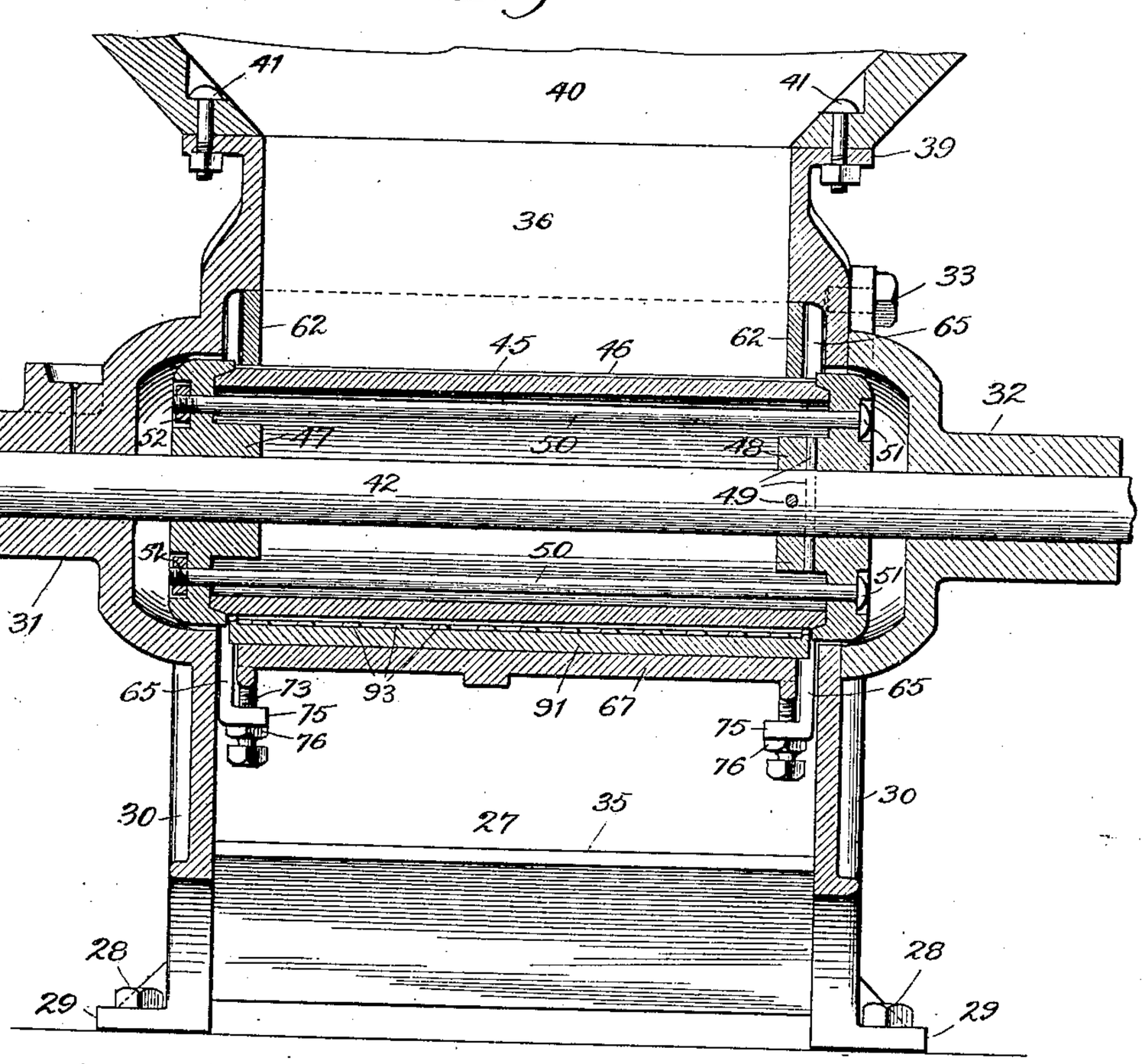


Fig. 5.

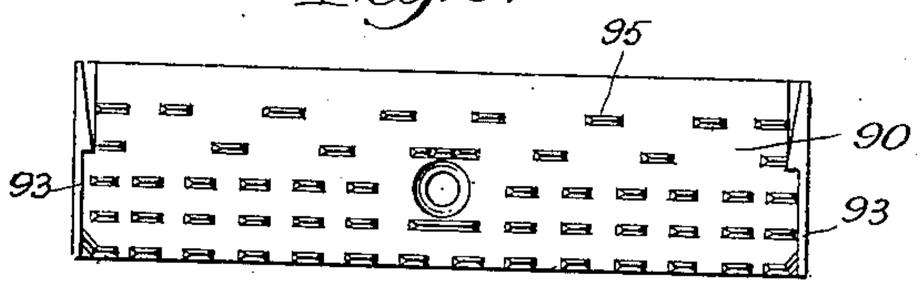
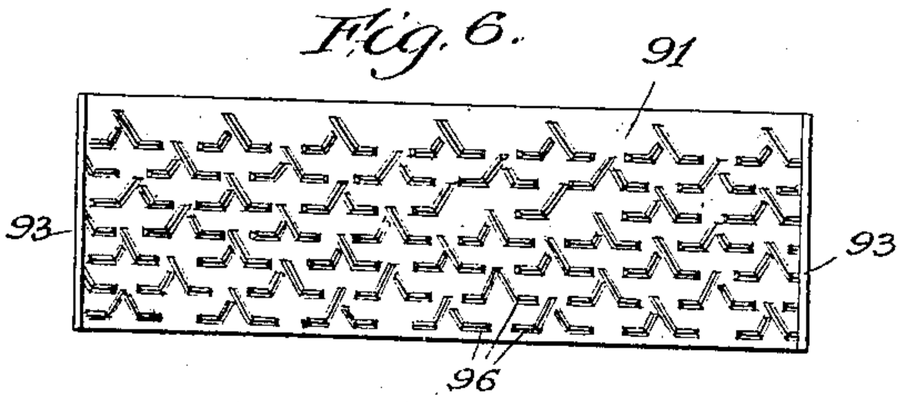


Fig. 6.



Witnesses:
Harry R. Lovlette
Ray White.

Inventor:
Louis Holland-Letz,
By John Howard McElroy
Atty.

UNITED STATES PATENT OFFICE.

LOUIS HOLLAND-LETZ, OF CHICAGO, ILLINOIS.

GRINDING-MILL.

No. 863,066. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed June 15, 1906. Serial No. 321,793.

To all whom it may concern:

Be it known that I, LOUIS HOLLAND-LETZ, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

My invention is concerned with a novel construction of mills designed especially for farmers' use for the coarse grinding of grains for cattle food, but which can be used for other purposes, and is designed to produce a mill of the class described that shall be durable and simple, capable of being cheaply constructed, and with all that can be easily and quickly adjusted to take up wear or to grind the grain to any desired degree of fineness.

To illustrate my invention, I annex hereto three sheets of drawings in which the same reference characters are used to designate identical parts in all the figures, of which

Figure 1 is a rear elevation of the machine; Fig. 2 is a front elevation of the same; Fig. 3 is a vertical section on the line A—A of Fig. 2; Fig. 4 is an enlarged view in section on the line B—B of Fig. 3; Fig. 5 is a plan view of the upper concave casting; Fig. 6 is a similar view of the lower concave casting; Fig. 7 (Sheet 1) is a perspective view from the rear of the hopper discharge casting; Fig. 8 is a similar view from the front of the same casting; Fig. 9 is a perspective view of the concave supporting casting; Fig. 10 is an enlarged sectional detail of the front supporting link; Fig. 11 is a perspective view of one of the pair of rear supporting links; Fig. 12 is a plan view of the lower feed controlling plate; Fig. 13 is an end view of the frame casting with the removable bearing in place; Fig. 14 is an end view of one of the cylinder heads showing the lug which prevents movement of the cylinder between the heads; and Fig. 15 is an enlarged vertical section through the two concave castings.

I preferably provide the base piece 20, best shown in Fig. 1, and mostly broken away in Figs. 2 and 3, which is of any suitable shape to support the mill proper and which is preferably secured in position by the crabs 21 which have the points 22 projecting down into the floor and the shoulders 23 adapted to take over the flange 24 at the base of the casting and to be secured by the screws 25, so that if it is desired to move the mill backward or forward all that is necessary is to loosen the screws 25, and when the mill has been adjusted, it can be secured in place by merely tightening the screws. On the top 26 of this base is mounted the frame casting 27, which is conveniently secured by the bolts 28 passing through the horizontal bottom flanges 29, as best shown in Fig. 4. This casting consists of the side pieces or plates 30, one of them having the bearing sleeve 31 integrally secured thereto, while the other one has the bearing 32 removably secured thereto by means of the screw bolts 33. The end plates are connected at the bottom by the webs 34 and 35, and at the rear by the webs 36, and at the front by the web 37, which is generally of a V-shape, except that the lower side is provided with the downwardly projecting flange 38. The webs 36 and 37 and the end pieces have the horizontal flange 39 extending entirely around the top of the casting and upon which the bottom edges of the wooden hopper 40 are placed and secured by the bolts and nuts 41, as clearly shown in Figs. 3 and 4.

Journaled in the bearings 31 and 32 is the shaft 42, which is provided on one end with the fly wheel 43 and on the other end with the belt pulley 44, by which it is driven. The grinding cylinder is, of course, secured upon this shaft, and is made up of the cylindrical shell 45, which is preferably a chilled casting having the toothed ribs 46 extending longitudinally thereof, and held in place between the two cylinder heads 47 and 48. The head 48 is rigidly secured upon the shaft 42 by the pins 49 passed through the hub of the head and the shaft, while the head 47 is loose on the shaft except as it is secured by means of the rods 50, which extend through the heads inside of the cylinder and have the heads 51 at one end and the nuts 52 at the other threaded end, the heads and nuts resting in recesses of the cylinder heads, as shown. By this means the cylinder is cheaply built and is securely fastened to the shaft. To prevent any tendency of the shaft to turn independently of the cylinder, I provide in the heads one or more recesses 53 into which project the lugs 54 formed on the ends of the cylinder, as clearly shown in Fig. 14.

The hopper discharge casting 55 through which the grain passes to the cylinder and grinding concave is best shown in Figs. 1, 3, 7 and 8, where it will be seen to have the rectangular shape with its front side 56 narrower than its rear side 57. It is secured at its rear side to the web 36 of the frame casting by the screw bolt 58 passing through the lug 59 into said web, and it is supported at its front end by means of the lugs 60 which rest upon the pins or lugs 61 secured in or projecting from the inner sides of the ends of the frame casting. The bottoms of the ends 62 are curved, as shown, to fit over the grinding cylinder so as to clear the ribs thereof, and the rear side 57 has the flange 63 projecting therefrom and formed with its under surface curved on the arc of a circle struck from the pivotal points 64 from which the rear supporting links 65 are swung, so that the surface 66 of the concave supporting casting 67 will coöperate therewith in whatever position the concave supporting casting may be adjusted. This concave supporting casting has the rearwardly extending sides 68 which are slotted at 69, as shown, and terminate in the outwardly projecting ears 70 through which are screwed the set screws 71, the ends of which take against the sides of the supporting links 65 which are pivoted at 64 to the inner sides of the ends

of the frame castings. These set screws 71 determine the front and rearward adjustment of the concave, and when the adjustment is made they are secured in place by means of the lock nuts 72. The vertical adjustment of the rear end of the castings is secured by means of the set screw bolts 73 which are screwed through the threaded aperture 74 in the inwardly projecting ear 75 forming the bottom of the link 65. This screw bolt 73 has its end coöperating with the bottom of the side 68 of the concave supporting casting 67, and when the adjustment is made, the bolt is secured in place by the lock nut 76. To further assist in securing this in place, I preferably employ the screw bolt 77 which passes through the slot 69 in the ends 68 and is screwed into the threaded aperture 78 suitably located in the link 65. The front end of the concave supporting casting 67 is supported from the web 37 by means of the front supporting link 79, best shown in Fig. 10, where it will be seen to consist of a rod threaded at its upper end and having a hook at its lower end passing through the aperture 80 in the ear 81 formed at the front and under side of the casting 67. A handle 82 is provided for varying the effective length of this link and consequently adjusting the front edge of the concave casting, and as shown, this handle has the threaded portion at its lower end, and to prevent the nut being loosened by the vibrations of the mill, I preferably cut away a portion of the thread, leaving the aperture 83 therein, and in this aperture I place the sectional nut 84 which has its side coöperating with the link 79 threaded, and is held in place by means of the leaf spring 85 resting against it at its lower end, while its upper end is secured in the handle, as shown. To hold the concave yieldingly, I mount upon the link 79 the collar 86 which rests against the bottom of the flange 38, which has a recess 87 cut therein to permit the link to be swung out, and between the collar 86 and the pin 88 near the bottom of the link I interpose the helically coiled expanding spring 89 which operates in the manner readily understood to hold the parts yieldingly in their proper position.

The grinding concave surface is preferably made up of the two separate castings 90 and 91, best shown in Figs. 5, 6 and 15, where it will be seen that the upper casting 90 is secured to the supporting casting 67 by means of the screw bolt 92. Both castings have along their ends the ribs 93 which extend upward a portion of the height of the teeth above the body of the casting and serve to prevent the ground feed from running over the edges of the concaves so that it will necessarily be discharged at the forward end of the lower concave 91. The concave casting 91 has its front and rear edges formed at an acute angle, as shown, and the rear edge fits under the obtuse angle formed by the front edge of the casting 90, and its front edge is secured by the acute angles formed in the overhanging lugs 94 on the forward ends of the concave supporting casting 67. The teeth 95 of the concave casting 90 are rectangular at their bases, and are inclined to form the sharp edges and preferably increase in height and frequency from the top toward the bottom of the casting, as shown in Fig. 5. The teeth 96 of the concave casting 93 are, as will be seen from Fig. 6, of a peculiar shape, they having the horizontal portions and the inclined portions projecting upwardly from one end of the horizontal portions. The object of giving this shape to the teeth is to prevent the grain from clogging at any point and, consequently, heating on account of the continued friction, as the inclined portions of the teeth form cam surfaces, as it were, which result in shoving the grains sidewise in their downward motion through the machine, and this sidewise thrust given to the grain prevents its clogging at any point.

To control the rate of feed of grain to the machine, I provide the feed controlling plates 97 and 98, both of which may be vertically adjustable by means of the bolts 99 and wing nuts 100, the bolts passing through the elongated slots 101 and 102 formed in the front of the hopper 40. The plate 97, best shown in Fig. 12, has its lower end formed with the teeth 103, and the end can be adjusted as close as desired to the rear wall 57 of the casting 55. The top plate 98, which may be plain or provided with teeth, can be adjusted up and down, or to the right or left, on the lower plate, and by thus opening or closing the apertures between the teeth 103, the rate of feed of the grain to the mill can be readily controlled.

To facilitate the discharge of the grain from the mill, I preferably employ the metallic chute 104, shown only in Fig. 3, which is of the proper shape to have its bottom rest upon the web 34 and have its top extend up to the bottom of the flange 38, and have its sides secured to the inner faces of the end pieces of the frame casting.

The operation of the complete apparatus will be readily understood without any explanation, and it will be seen that by means of the adjustments employed, the rate of feed and also the fineness with which the material shall be ground can be readily and quickly controlled by the adjustments. When it is desired to get at the grinding concave, the links 79 can be released by manipulating the handle 82, and swung forward and as the links at 65 are pivoted, the entire concave can be swung away from the spring.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it is understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims, except as may be necessitated by the state of the prior art.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a grinding mill, the combination with the horizontal cylinder and means for rotating it, of the suspended concave coöperating therewith, the link connected at one end to one side of the concave and having an abutment on the other end resting on the stationary part of the machine, a collar on said link, the spring pressing the collar against the stationary part of the machine to hold the link in place, and means for adjusting the other side of the concave relative to the cylinder.

2. In a grinding mill, the combination with the horizontal cylinder, and means for rotating it, of the suspended concave coöperating therewith, the link connected at one end to one side of the concave and having an adjustable abutment on the other end resting on the stationary part of the machine, the collar on said link, the spring pressing the collar against the stationary part of the machine to hold the link in place, and means for adjusting the position of the other side of the concave relative to the cylinder.

3. In a grinding mill, the combination with the horizontal cylinder and means for rotating it, of the concave

coöperating therewith, the pivoted links supporting the concave at its front and rear, means for adjusting the position of the concave on the rear links, and means for adjusting the effective length of the front link, consisting of the pivoted link rod having its upper end threaded, the nut, the abutment for the nut to engage, and the spring to hold the nut against the abutment.

4. In a grinding mill, the combination with the horizontal cylinder and means for rotating it, of the concave coöperating therewith, the pivoted links supporting the concave at its front and rear, means for adjusting the position of the concave on the rear links, and means for adjusting the effective length of the front link, consisting of the pivoted link rod having its upper end threaded, the nut, the abutment for the nut to engage, and the helically coiled expanding spring surrounding the link and coöperating with a loose collar engaging one side of the abutment.

5. In a grinding mill, the combination with the horizontal cylinder and means for rotating it, of the concave coöperating therewith, the pivoted links supporting the concave at its front and rear, means for adjusting the position of the concave on the rear links, and means for adjusting the effective length of the front link, consisting of the pivoted link rod having its upper end threaded, the nut, a spring to hold the nut against the abutment, and a spring pressed sectional nut coöperating with the threaded portion of the link.

6. In a grinding mill, the combination with the horizontal cylinder and means for rotating it, of the concave coöperating therewith, the pivoted links supporting the concave at its front and rear, means for adjusting the position of the concave on the rear links, and means for adjusting the effective length of the front link, consisting of the pivoted link rod having its upper end threaded, the nut, the abutment for the nut to engage, the helically coiled expanding spring surrounding the link, a loose collar engaging one side of the abutment and with which the spring coöperates, and a spring pressed sectional nut cooperating with the threaded portion of the link.

7. In a grinding mill, the combination with the frame casting, of the cylinder journaled therein, the hopper discharge casting rigidly secured to the frame casting, the concave supporting casting, and the supporting links for the concave supporting casting, said hopper discharge casting and concave supporting casting having the cooperating surfaces curved on an arc with the pivotal points of the links as a center.

8. In a grinding mill, the combination with the frame casting, of the cylinder journaled therein, the hopper discharge casting rigidly secured to the frame casting, the concave supporting casting, the supporting links for the concave supporting casting, said hopper discharge casting and concave supporting casting having the coöperating surfaces curved on an arc with the pivotal points of the links as a center, and means for adjusting the position of the concave supporting casting on the links.

9. In a grinding mill, the combination with the frame casting, of the cylinder journaled therein, the hopper discharge casting rigidly secured to the frame casting, the concave supporting casting, the supporting links for the concave supporting casting, said hopper discharge casting and concave supporting casting having the coöperating surfaces curved on an arc with the pivotal points of the links as a center, means for adjusting the position of the concave supporting casting on the links, and the detachable link supporting the front of the concave supporting casting.

10. In a grinding mill, the combination with the concave supporting casting having the overhanging lugs 94 at the front end, of the concave casting 90 secured to the top of the rear of the concave supporting casting and having the overhanging front edge and the concave casting 91 secured between said overhanging front edge and the lugs 94, substantially as described.

11. In a grinding mill, the combination with the frame casting, of the hopper discharge casting having the ear 59 and the lugs 60, the pins 61 on the frame casting cooperating with the lugs 60, and the bolt 58 passed through the ear 59 into the frame casting, substantially as and for the purpose described.

12. In a grinding mill, the combination with the base piece for the flange 24, of the crabs 21 having the projections 22 and the overhanging flanges 23, and the screw 25, arranged and coöperating, substantially as and for the purpose described.

13. In a grinding mill, the combination with the cylinder, of the concave coöperating therewith, having the teeth of the upper portion transverse to the direction of movement of the material through the concave and the teeth of the lower portion in part transverse to and in part inclined toward the direction of movement of the material through the concave, and means for rotating the cylinder.

In witness whereof, I have hereunto set my hand this 13th day of June, 1906.

LOUIS HOLLAND-LETZ.

In the presence of witnesses—
JOHN H. MCELROY,
E. K. MANCHESTER.