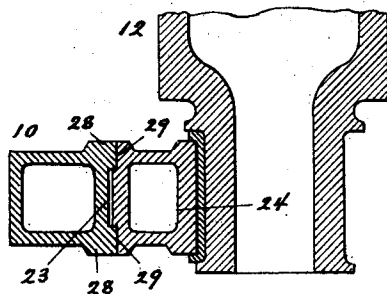
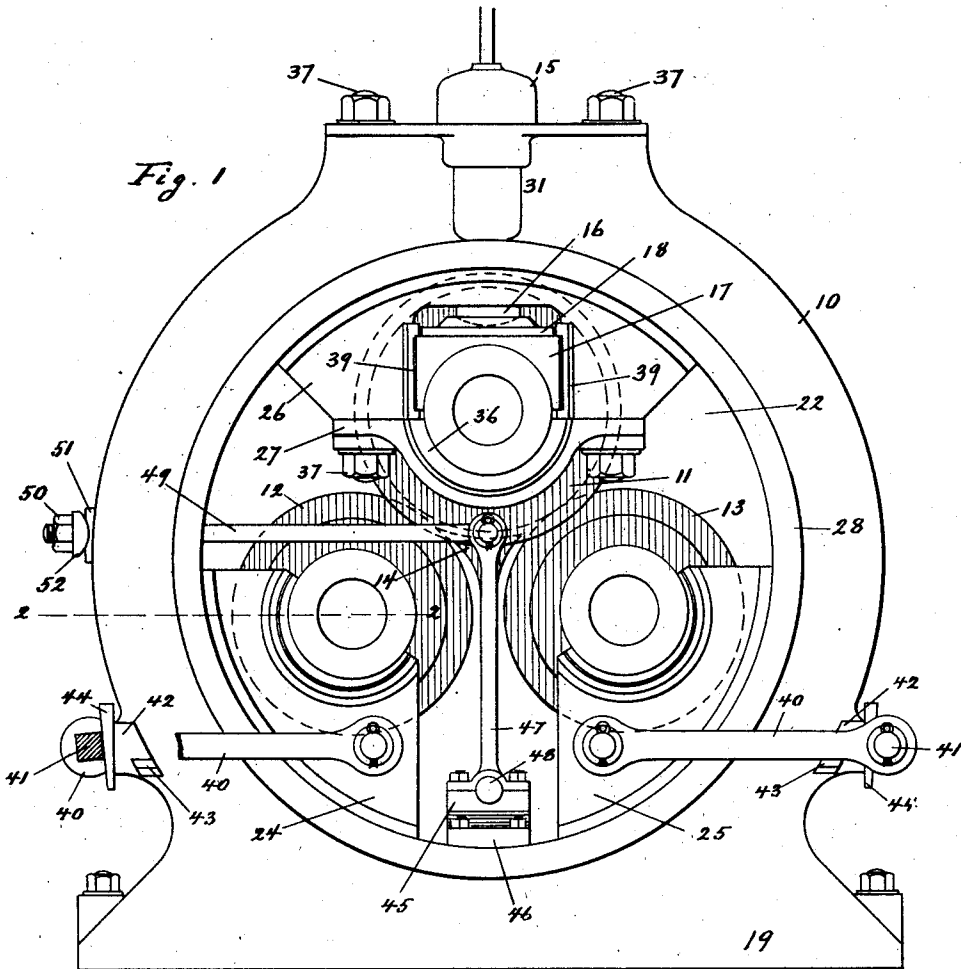


J. H. FOGARTY.
CANE MILL.
APPLICATION FILED DEC. 15, 1910.

1,037,885.

Patented Sept. 10, 1912.

3 SHEETS—SHEET 1.



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J. H. FOGARTY.

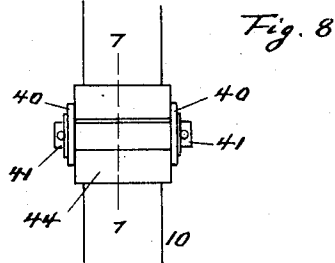
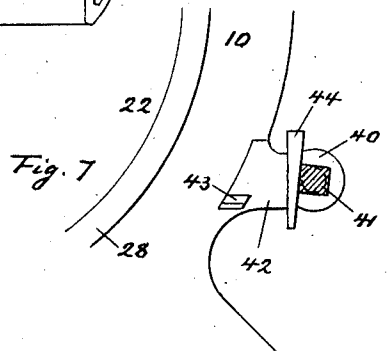
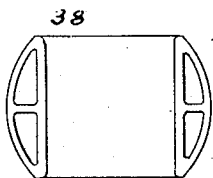
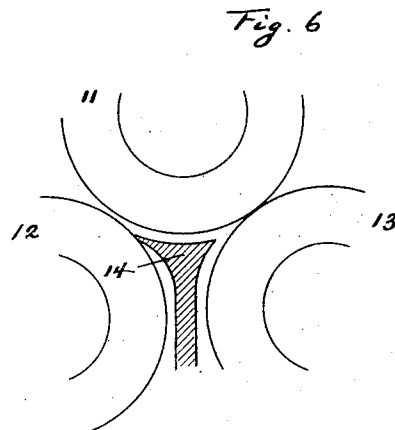
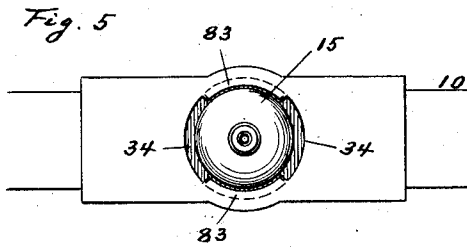
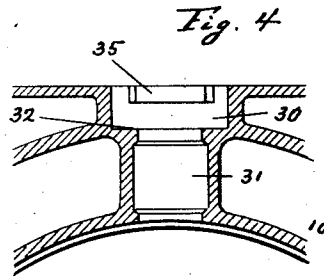
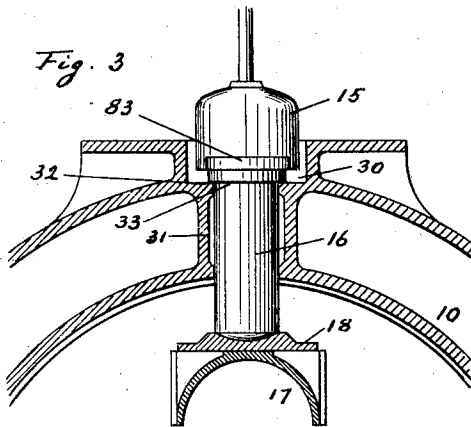
CANE MILL.

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1,037,885.

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3 SHEETS—SHEET 2.



Witnesses:
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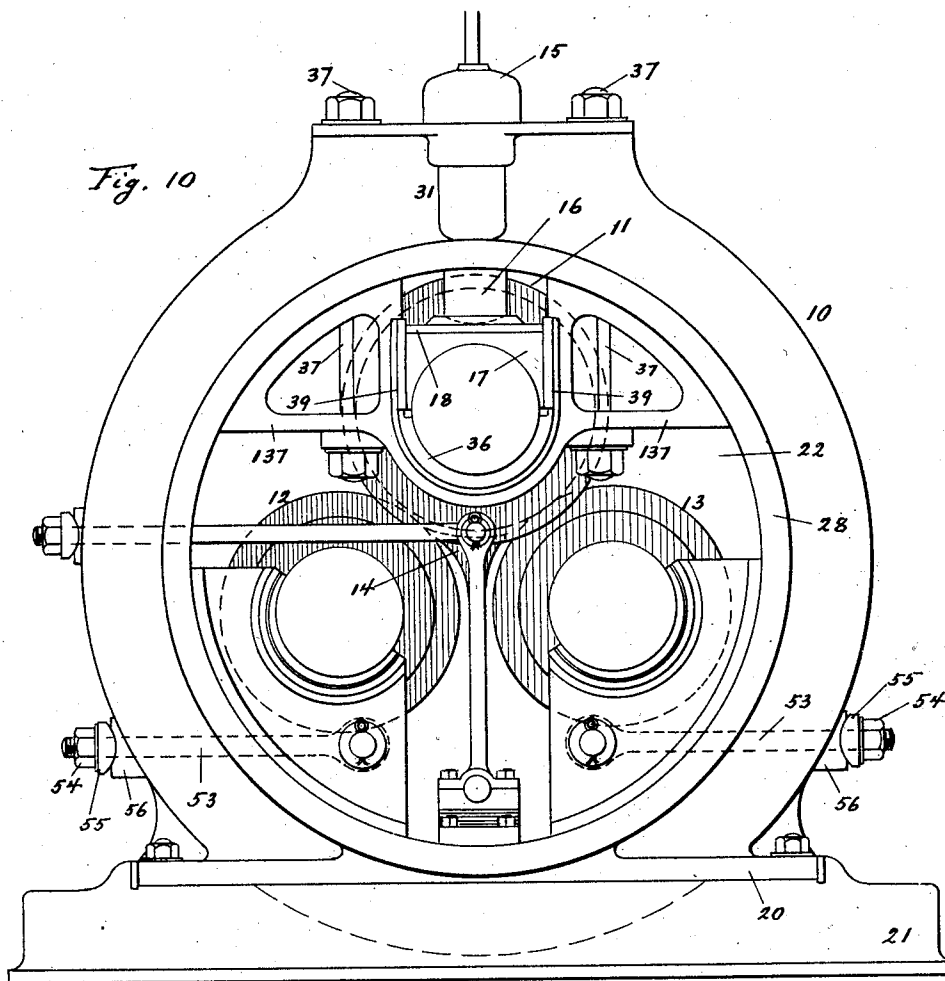
Inventor
James H. Fogarty
 By his Attorney *Chas. C. Lee*

J. H. FOGARTY.
CANE MILL.
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1,037,885.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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TO EMILE J. MÉTÉRIÉ, OF EAST ORANGE, NEW JERSEY.

CANE-MILL.

1,037,885.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed December 15, 1910. Serial No. 597,507.

To all whom it may concern:

Be it known that I, JAMES H. FOGARTY, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Cane-Mills, of which the following is a specification.

The invention relates to improvements in cane-mills, more particularly of the type adapted for use in making sugar, and its object is generally to provide a cane-mill of very durable construction, efficient in operation and convenient in the assemblage of its parts.

One special object of the invention is to provide novel housings to receive the bearings for the rolls and adapted to permit the convenient introduction and removal of the rolls and their bearings, and also the turn-plate, through openings in said housings, said housings each preferably being in one integral casting and having a large circular opening to admit the rolls and their bearings and permit the convenient manipulation and withdrawal of the same. With the housings of my invention I am enabled to provide unusually large bearings for the rolls, which is a feature of advantage, and at the same time bring the two lower rolls in appropriately near relation to each other, so as to shorten the line of travel of the partly crushed cane over the turn-plate from the front lower roll to the rear lower roll, whereby the danger of the cane clogging about the turn plate is avoided. The housings of my invention also afford novel means for detachably mounting and securing the hydraulic cylinders and their plungers for the top roll without the use of bolts or the like, as heretofore employed, and, further, in accordance with my invention the hydraulic plungers exert no pressure against the top roll except during the grinding operation or when cane is passing between the lower rigidly sustained front roll and said top roll and exerting a force, due to its crowding between said rolls, driving the top roll upwardly against said plungers and the resistance created thereby.

The invention embodies various novel and advantageous features and combinations of parts, all of which will be more fully understood from the detailed description herein-

after presented, reference being had to the accompanying drawings, in which:

Figure 1 is an end elevation, partly broken away and partly in section, of a cane-mill embodying my invention; Fig. 2 is a top sectional elevation of a portion of the same on the dotted line 2-2 of Fig. 1; Fig. 3 is a detached central longitudinal section through the upper portion of one of the end housings, with one of the hydraulic cylinders and its piston and one of the top bearings for the top roll in operative relation; Fig. 4 is a corresponding view of the same, with said hydraulic cylinder, piston and bearing omitted; Fig. 5 is a detached top elevation of that portion of the mill shown in Fig. 3; Fig. 6 is a detached diagrammatic end view, partly broken away and partly in section, of the three rolls and the turn-plate of the mill; Fig. 7 is a detached end view of a portion of one of the end-housings, partly broken away and with a cooperating part in section on the dotted line 7-7 of Fig. 8; Fig. 8 is a rear edge view of the same; Fig. 9 is a detached bottom view of a modified form for the top brass or bearing for the top roll; and Fig. 10 is an end view of my mill slightly modified in a few of its features from the construction shown in Fig. 1.

In the drawings the reference numeral 10 designates the end-housings, 11 the top-roll, 12 the lower front roll, 13 the lower rear roll, 14 the turn-plate, 15 the hydraulic-cylinder, 16 the plunger connected therewith for the top-roll, 17 the top-bearing or brass for the top-roll, and 18 a steel-plate mounted upon the bearing 17 and having in its upper surface a concave seat adapted to receive the convex lower end of the plunger 16, as shown in Fig. 3.

At each end of the mill there is a housing 10, one being a duplicate of the other, and each being an integral casting formed with a complete base 19, as shown in Fig. 1, to be bolted to a suitable bed, or with a less extensive base 20, as shown in Fig. 10, to be bolted to a substantial base 21, which in turn will be secured to the bed provided for the mill. The housings or head-stocks 10 are each formed with a large concentric circular opening 22 containing in its walls or forming a groove or runway 23 (Fig. 2) to receive exterior edge portions of the bear-

ings 24, 25 for the lower rolls and the sustaining block 26 for the lower bearing 27 and upper bearing 17 for the top roll 11. The housings 10 are formed around the openings 22 with annular flanges 28 which serve to strengthen the castings and afford laterally beyond the runway 23 bearing surfaces 29 (Fig. 2) for the edge portions of the bearings 24, 25 and block 26. An important feature of the housings 10 is the presence therein of the large openings 22 adequate to permit the insertion and removal of the rolls and their bearings and the turn-plate through the same. The housings 10 are also, of special construction in their upper portions with respect to the hydraulic cylinders 15 and their plungers 16, in that said housings are each formed with a chamber 30 to receive the lower portion of the cylinder 15 and with a cylindrical portion 31 to encompass the plunger 16 and afford at the upper edge of said portion 31 an annular shoulder 32 to serve as a stop to engage an annular shoulder 33 on the plunger 16 and hold said plunger at a predetermined position when pressure is applied on the upper end thereof, whereby said plunger during the use of the mill is prevented from pressing against the top bearing for the top roll 11 except when cane is passing below said roll and exerting a force to press said roll upwardly against and in opposition to the downward pressure normally on said plunger. When the mill is not actually crushing or grinding cane the plungers 16 are, by the construction just described, prevented from exerting any special pressure against the top bearings for the roll 11, and hence the bearings for said roll are more lasting than they otherwise would be.

The cylinders 15 carry the plungers 16 and are each secured to and detachable from the housing 10 without the use or manipulation of bolts and the like. Each cylinder 15 is formed on opposite sides with lateral flanges 33 (Fig. 3), which, after the manner of a bayonet joint, may pass downwardly through recesses 34 in the housing 10 (Fig. 5) and then by an angular movement of the cylinder be turned below depending flanges 35 formed on said housing (Fig. 4) to lock the cylinder in position or resist upward pressure against the same, while at the same time such construction permits the ready removal of the cylinder and plunger when desired or necessary and the convenient replacement of the same in operative position.

The upper or top roll 11 is supported at its ends on brasses or bearings 36 held by the bearing-yokes 27 which are secured to the blocks 26 by vertical bolts 37 extending through the housings 10, blocks 26 and said yokes 27 and serving to secure the blocks

26 in place. The blocks 26 fit within the upper edges of the openings 22 in the housings 10, and they are open at their vertical middle portions to receive and guide the upper bearings 17 for the top-roll and the plates 18 thereon. The block 26 and yoke 27 may be made in separate pieces, as shown in Fig. 1, or they may constitute an integral casting 137, as shown in Fig. 10, in which event the middle opening in the block will extend through the upper end of the casting so as to conveniently receive the lower bearing-brass 36, the end of the roll 11 and the upper bearing 17 with its plate 18. In either construction the top roll 11 will be capable of limited vertical movement and its bearings will be guided in the sides of the opening in the block 26 or casting 137, as the case may be. The plate 18 upon the upper bearing 17 is preferably of steel and has a concave seat formed in its upper surface to receive and take the wear occasioned by the lower convex end of the plunger 16, as shown in Fig. 3; said seat and plunger constructed as described also assures the efficient action of the plunger regardless of any slight deviation of the parts, due to wear or the like from their initial relative positions. The bearing 17 and plate 18 may of course be in one piece but for the sake of economy and correctness of workmanship I make them in two separate pieces. The vertical edges of the bearing 17 may be convexed, if desired, as I show in Fig. 9, in which I number said bearing, as a modification, 38. The bearing 17 may be protected at its vertical edges against undue wear by the application thereto, according to familiar mechanical practice, of steel facings 39. The yokes 27 normally support the top roll 11 but permit said roll to yield upwardly against the plungers 16 when cane is passing between said roll and the front lower roll 12.

The rolls 11, 12, 13 may be of usual construction but since the features of my invention admit of the employment of unusually large bearings for said rolls the rolls may be made hollow, as I indicate in Figs. 1 and 2, whereby a saving of material may be effected and convenience in handling the rolls secured, the hollow rolls being just as effective as the solid rolls and more readily handled and adjusted.

The lower rolls 12, 13 are duplicates and respectively mounted in the bearings 24, 25, which are at opposite sides of the vertical center of the housings 10 and have outer edges which match the inner periphery of the openings 22 in said housings. Each bearing 24, 25 is capable of adjustment along the edge of the opening 22 to vary the relation of the respective rolls 12, 13 with the roll 11, and either bearing may be lowered sufficiently for its roll to entirely

clear the roll 11 and be withdrawn endwise from the mill without disturbing the other lower roll or the roll 11. The roll 12 should be separated from the roll 11 so as to readily admit the cane, as usual, while the roll 13 should be in close relation to the roll 11, and said rolls 12, 13 are firmly supported in their proper relations to the roll 11 by the bearings 24, 25, which are adjustably maintained in the housings 10 (Figs. 1, 7 and 8) by links 40 straddling the housings and pivotally secured at their inner ends to said bearings and at their outer ends being pivotally secured on the rounded ends of bars 41, preferably polygonal in cross-section, which are normally adjacent to but separated from vertical shoulders 42 formed on the housings 10. The housings are formed adjacent to the shoulders 42 with laterally projecting lugs 43 which serve as supports for the links 40 when the latter are in normal position, as shown in Fig. 1, whereby said links are prevented from settling downwardly at their outward portions. I provide intermediate the bars 41 and shoulders 42 means for varying the distance between the inner ends of said links and the shoulders 42 so as to effect the vertical adjustment of the bearings 24, 25, and in the present instance these means comprise wedges 44 which may be driven downwardly to a greater or less extent between the shoulders 42 and bars 41 and thus control the exact position of the bearings 24, 25 and secure the proper and most effective relation of the rolls 12, 13 to the roll 11. The bearings 24, 25 are, by means of the wedges 44 and their co-acting parts, independently adjustable, and hence either roll 12, 13 may be adjusted without regard to the other roll. The capability of independently adjusting the bearings 24, 25 is also important in compensating for any wear which may take place in the bearing surfaces due to the continued use of the mill. The bearings 24, 25 present extended surfaces to the edges of the opening 22 in the housing 10, and hence they have a substantial support in said housing. The outer edges of the bearings 24, 25 are concentric with the line of circle of the openings 22, and hence may readily follow along the edges of said openings and maintain their firm relation with the housings during their adjustment or upward and downward movement therein. By driving the wedges 44 downwardly so that their thicker portions become interposed between the bars 41 and shoulders 42, the links 40 are caused to travel outwardly to a limited extent and thereby effect the upward adjustment of the bearings 24, 25 and their rolls 12, 13.

When the wedges 44 are driven upwardly they allow the bearings 24, 25 to settle somewhat downwardly, the weight of the bearings pulling through the links 40 having the

effect of keeping the bars 41 close against the wedges 44. The bars 41 are preferably rectangular in cross section so that they may present flat surfaces to the wedges, as shown at the left hand side of Fig. 1. The links 40 are not directly secured to the housings 10 but rest upon the lugs 43 and may at the bars 41 engage the shoulders 42 when the wedges 44 are absent, and said links 40 are thus readily detachable from the housings 10 and may also be entirely freed from the bearings 24, 25. When it is desired to remove either roll 12 or 13, the bearing 24 or 25, as the case may be, of said roll, is allowed to slide downwardly along the edges of the opening 22 until the roll is entirely clear of the roll 11, and thereupon, the links 40 being freed, the roll and its bearing may be removed from the housing. One of the main purposes of the invention is to permit of the ready removal and insertion of the rolls 12, 13. When it is desired to remove the upper roll 11 the bearings 24, 25 will be allowed to slide downwardly along the housing so as to carry the rolls 12, 13 from the plane of the roll 11 and thereupon by removing the yoke 27, the roll 11 may be readily withdrawn.

The turn-plate 14 is a feature which should, of course, first be withdrawn before the attempt is made to withdraw the rolls 12, 13, and in the construction of housing presented said turn plate may be readily withdrawn through the opening 22 in the housing. The turn plate 14 is employed in this machine for its usual purposes of directing the cane that passes between the rollers 11, 12 to the roller 13, so that the further grinding may take place between the rolls 13, 11. The turn-plate 14 in accordance with my invention is pivotally secured at its lower end in bearings 45 mounted on bearing blocks 46 secured by bolts to the lower edges of the opening 22. The turn-plate proper is supported by end bars 47 which constitute a part of the structure and have at their lower ends the trunnions 48 which are mounted in said bearings 45. The upper ends of the bars 47 have pivotally connected with them the horizontally extending rods 49, which in the construction shown in Fig. 1 extend through the housings 10 and have upon their outer ends nuts 50 for enabling the convenient adjustment horizontally of the rods 49 whereby to regulate the relation of the front edge of the turn-plate 14 with the roller 12. Upon the housing 10 adjacent to the nut 50 is formed a shoulder 51 having a concave seat for a washer 52 which is free on the rod 49 and has a convex surface to engage said concave seat. The turn-plate 14 is, therefore, pivotally mounted from the bearings 45 and provided with rods 49 for its adjustment toward and from the roller 12. The turn-plate may be withdrawn from the end

of the machine by loosening the blocks 46 or bearings 45, either or both, and detaching the rods 49, thus leaving the turn-plate free to be moved endwise from the mill.

5 In the construction shown in Fig. 10 I show a modification in that the wedges 44 of Fig. 1 have been omitted and there are substituted for the links 40 of Fig. 1, pivoted rods 53 which correspond with the rod 49
10 and its parts shown in Fig. 1. The rods 53 are pivotally secured to the bearings 24, 25 and extend horizontally through the housings 10 and are rendered adjustable so as to vary the position of said housings and their
15 rolls 12, 13 by means of nuts 54 which engage loose washers 55 whose inner convex surfaces engage concave seats formed on shoulders 56 cast integrally with the housings. The nuts 54 enable the adjustment of
20 the bearings 24, 25 in the manner and for the same purposes that the wedges 44 of Fig. 1 are employed. I illustrate the rods 53 and nuts 54 in Fig. 10 for the purpose of indicating that I do not limit my invention specif-
25 cally to the employment of the wedges 44 for enabling the adjustment of the bearings 24, 25 and rolls 12, 13.

The operation of the mill hereinbefore described will be fully understood without ex-
30 tended additional explanation, since a mill having the three rolls is not new, and my invention resides in the mechanical structure hereinbefore specifically described, the mechanism shown in either Fig. 1 or Fig. 10
35 being the same at each end of the mill. The mill of my invention permits of the use of integral one-piece end-housings, since in the construction presented the rolls may be inserted or withdrawn without disturbing the
40 housings. In some other known mills the housings are in parts bolted together and when it is desired to remove a roll or rolls the housings themselves have to be dismantled, this being a matter my invention
45 avoids.

What I claim as my invention and desire to secure by Letters Patent, is:

1. In a roller-mill, an end housing having a large circular opening (22) therein whose
50 edge wall affords a uniform bearing surface, bearings set within said opening and against said wall, and rolls mounted in said bearings, said bearings and wall having inter-
55 engaging surface formations to aid in placing the said bearings and resisting lateral displacement of the same, and said opening permitting the insertion and removal there-
through of the said rolls and their bearings; substantially as set forth.

60 2. In a roller-mill, an end housing having therein a large opening (22) whose laterally opposite lower edge walls are on the line of a half-circle, means supporting the top-roll, oppositely disposed bearings having their
65 outer edges fitted to said edge walls, lower

rolls mounted in said bearings and means independently securing and permitting the adjustment of said bearings and their rolls, said opening enabling the sliding down-
wardly of said lower rolls and their bear- 70 ings to free the top roll and permit the removal of any or all of the rolls and their bearings through the said opening; substantially as set forth.

3. In a three-roll cane mill, an integral
75 one-piece end housing having therein a large circular opening, a bearing support for the top roll secured against the upper edge wall of said opening, oppositely dis-
posed bearings mounted on the opposite 80 lower edge walls of said opening and slidable toward and from each other, lower rolls mounted in said bearings and means inde-
pendently securing and permitting the ad- 85 justment of said bearings and their rolls, said opening enabling the sliding down-
wardly of said lower rolls and their bear- ings to free the top roll and permit the re-
moval of any or all of the rolls and their 90 bearings through the said opening; substantially as set forth.

4. In a three-roll cane-mill, an integral one-piece end housing having a commodious opening therein, bearings mounted within
said opening for the rolls, and rods pivoted 95 to the bearings for the lower rolls and extending outwardly from the housing for securing and adjusting the relative positions of said lower rolls and their bearings, all
said rolls and their bearings being remov- 100 able through said opening without disturbing any part of the housing; substantially as set forth.

5. In a roller-mill, an end housing having therein an end opening, a bearing-block
105 fitted to the upper edge of said opening and having an open central portion and bearings therein for the upper roll, bolts detachably securing said block in position, bearing-sup-
ports slidably mounted in opposite sides of 110 the lower portion of said opening for the front and rear lower rolls, and means for securing said supports, the top bearing for the upper roll being vertically movable in
said bearing-block and said block taking the 115 weight of said roll; substantially as set forth.

6. In a roller-mill, an end housing having therein an end opening, a bearing-block
120 fitted to the upper edge of said opening and having a central vertical open portion and bearings therein for the upper roll, front and rear lower rolls for coöperation with said upper roll, and a hydraulic cylinder mount-
ed in the upper end of said housing and hav- 125 ing its piston arranged to act against the top-bearing for said upper roll; substantially as set forth.

7. In a roller-mill, an end housing, a bear-
ing-block fitted thereto having a vertical 130

open portion and bearings therein for the upper roll, front and rear lower rolls for co-operation with said upper roll, and a hydraulic cylinder secured in the upper end 5 of said housing and having its piston arranged to act against the top bearing for said upper roll, said cylinder having lateral flanges (83) and said housing having recesses 34 to receive said flanges and also 10 flanges 35 below which the flanges on the cylinder may be turned to secure the cylinder against upward movement; substantially as set forth.

8. In a roller-mill, an end housing, a bearing-block fitted thereto having a vertical 15 open portion and bearings therein for the upper roll, front and rear lower rolls for co-operation with said upper roll, and a hydraulic cylinder secured in the upper end 20 of said housing and having its piston arranged to act against the top bearing for said upper roll, said piston having a shoulder 33 and said housing a shoulder 32

to receive said shoulder 33 and prevent the said piston from exerting material pressure 25 on the bearing for the top roll except when cane is passing through the mill and forcing said roll upwardly; substantially as set forth.

9. In a three-roll mill, an end housing 30 having a large end opening therein through which the rolls and their bearings may be inserted and removed, a turn-plate pivotally mounted at its lower end and exposed to be removed through said opening, and means 35 connected with the upper end of said turn-plate for adjusting the plate with relation to the upper roll; substantially as set forth.

Signed at New York city, in the county of New York and State of New York, this 14th 40 day of December A. D. 1910.

JAMES H. FOGARTY.

Witnesses:

ARTHUR MARION,
CHAS. C. GILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
