

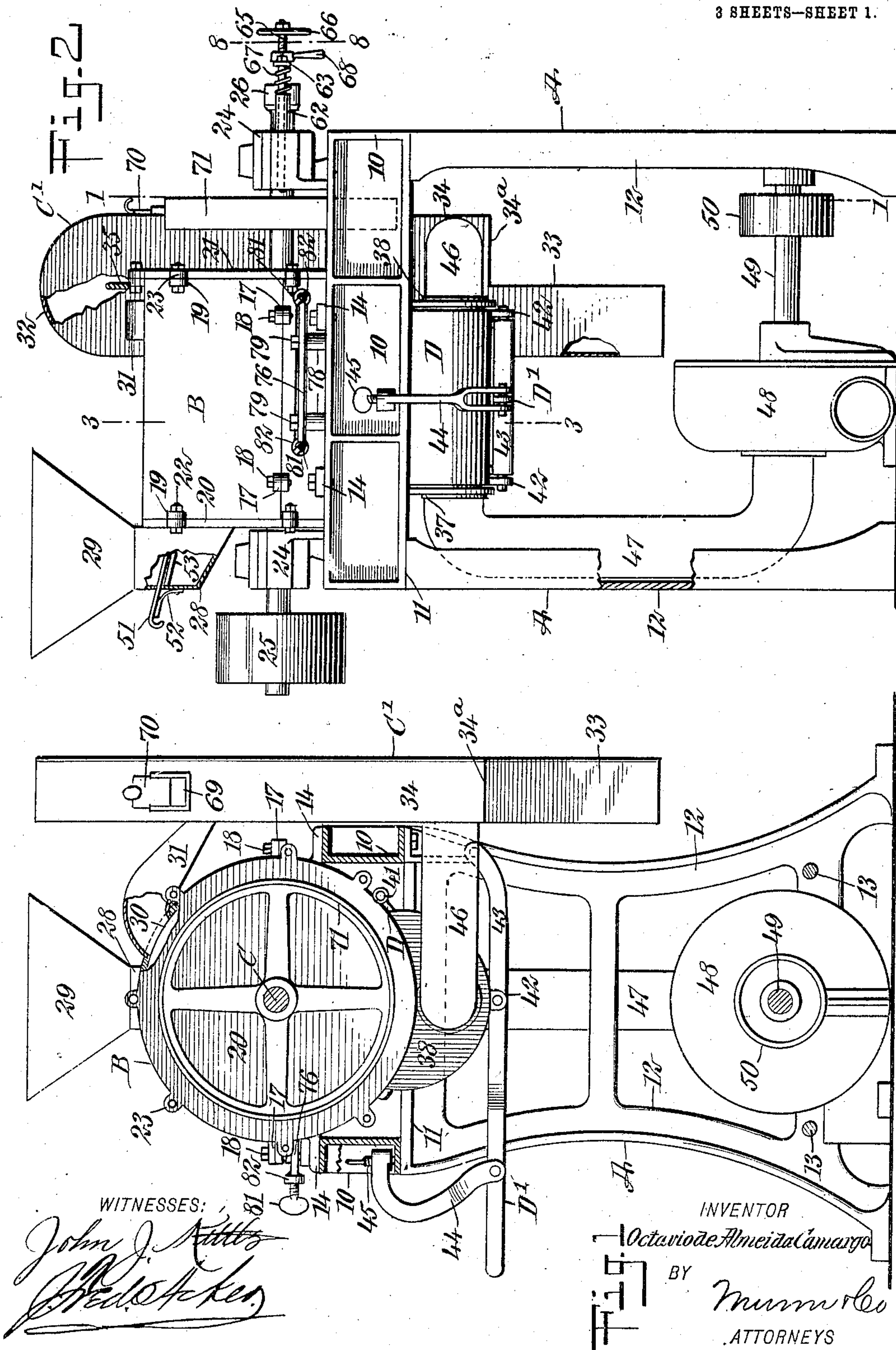
No. 836,011.

PATENTED NOV. 13, 1906.

O. DE A. CAMARGO.
GRAIN SHELLING AND HULLING DEVICE.

APPLICATION FILED FEB. 1, 1906.

3 SHEETS—SHEET 1.



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Fig. 4

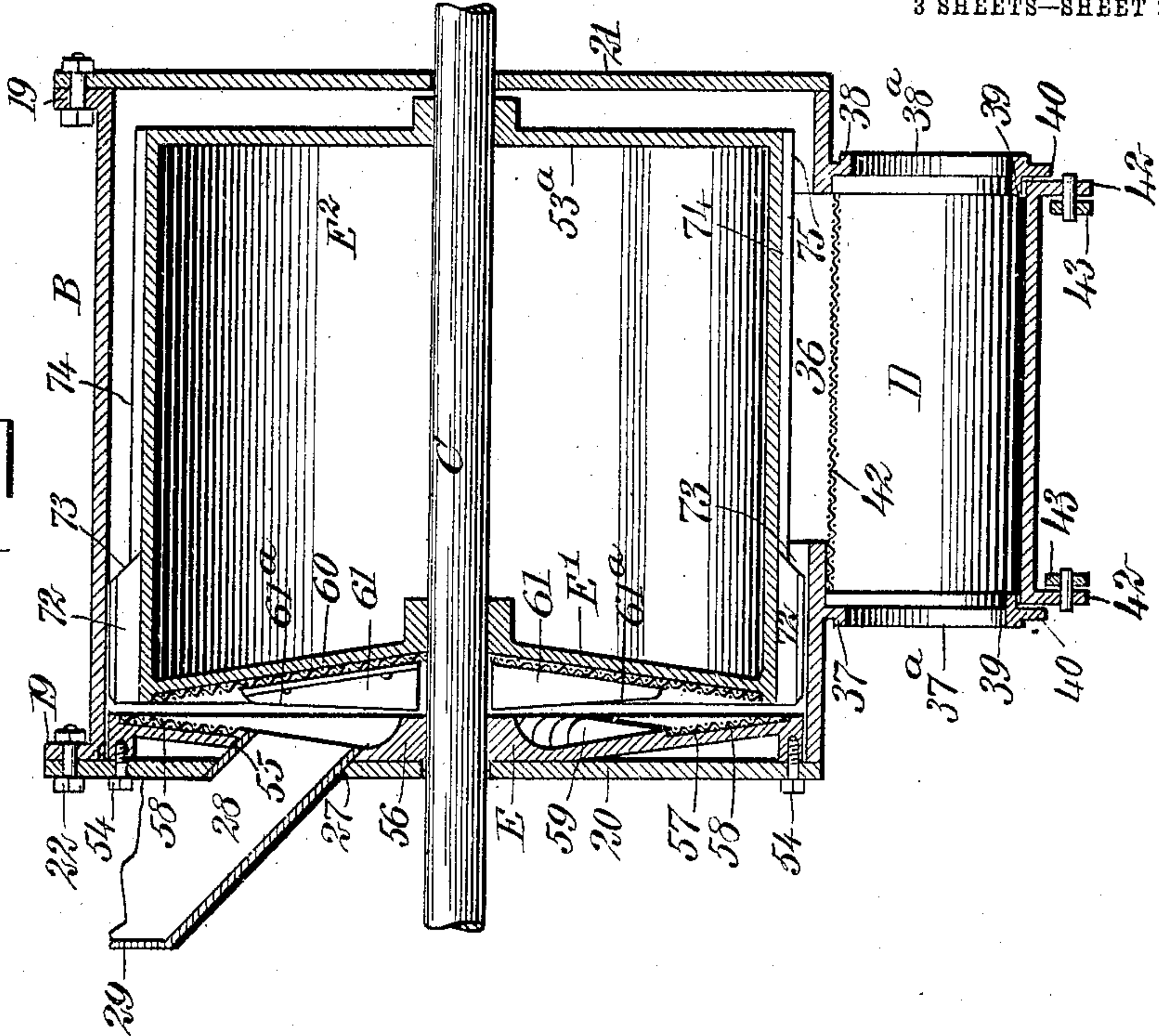
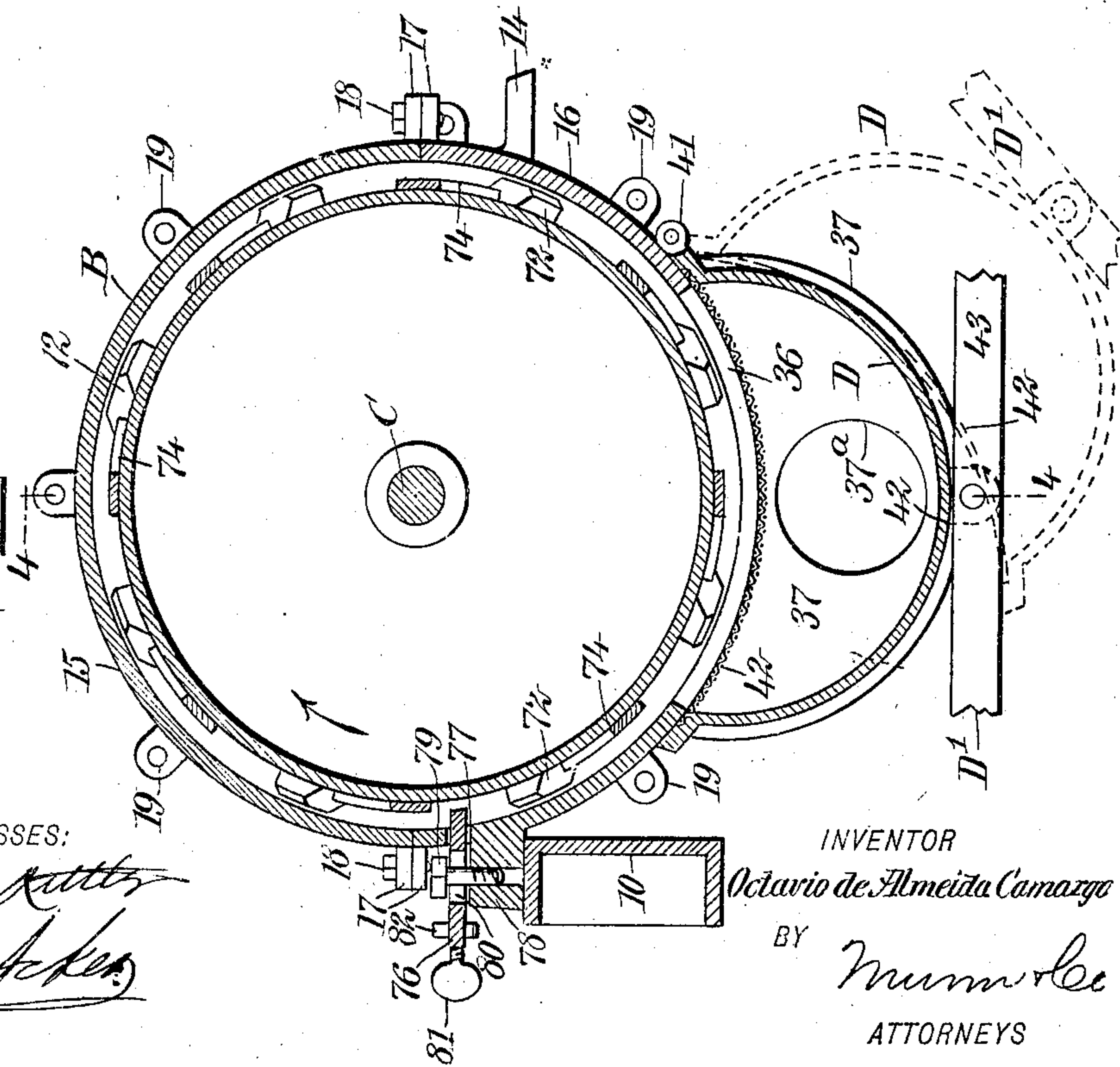


Fig. 3



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3 SHEETS—SHEET 3.

Fig-7

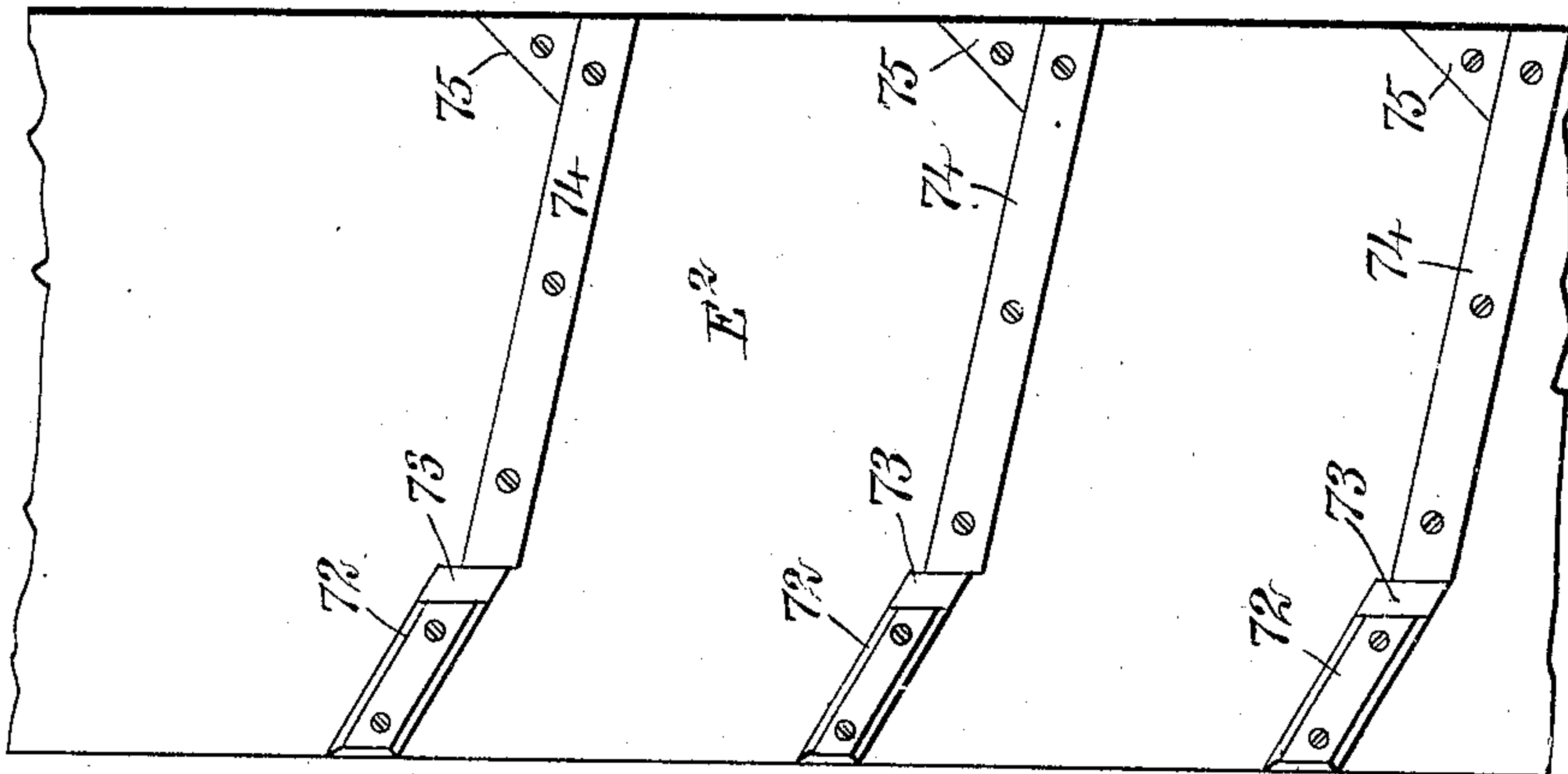


Fig-5

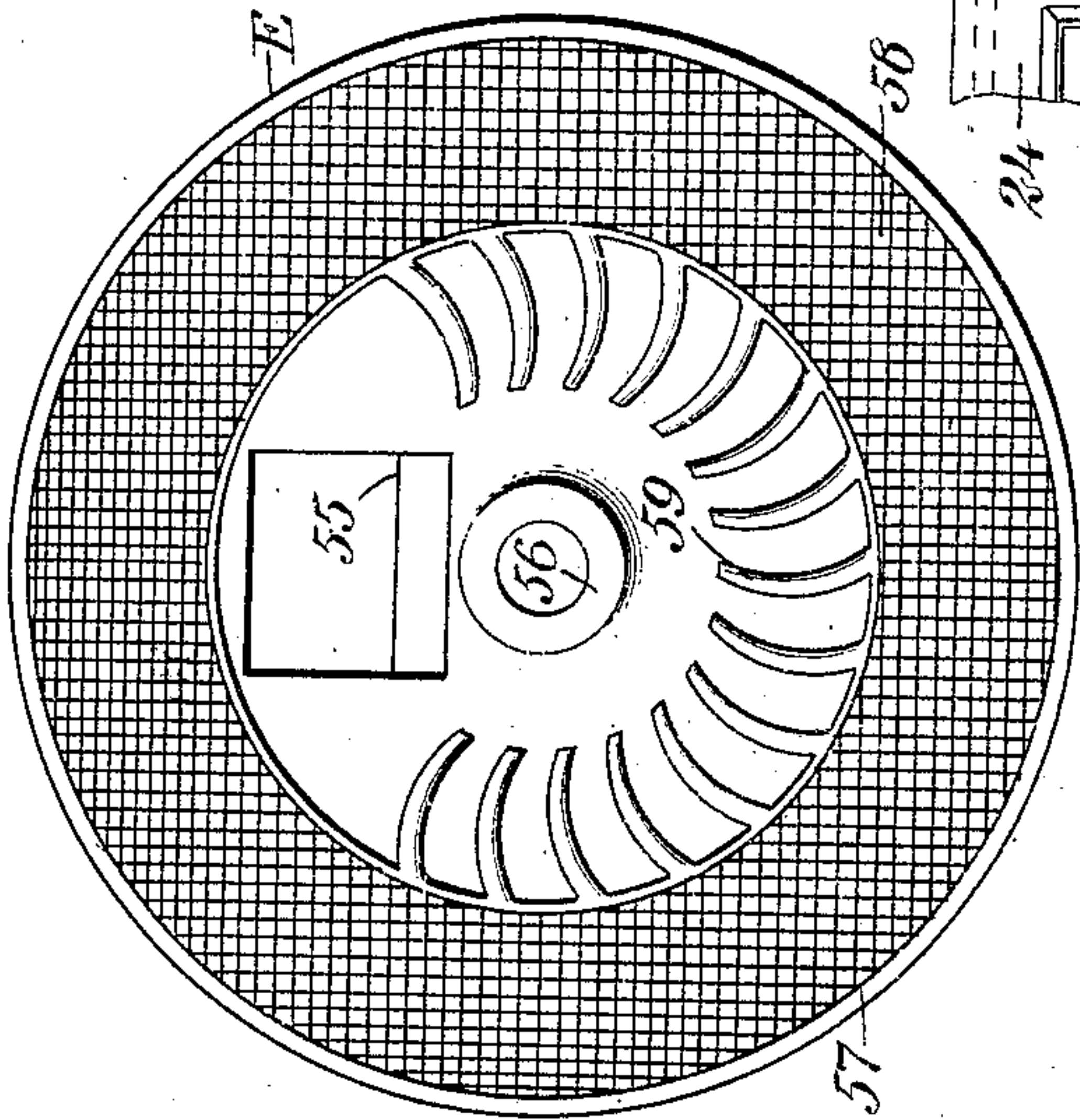


Fig-9

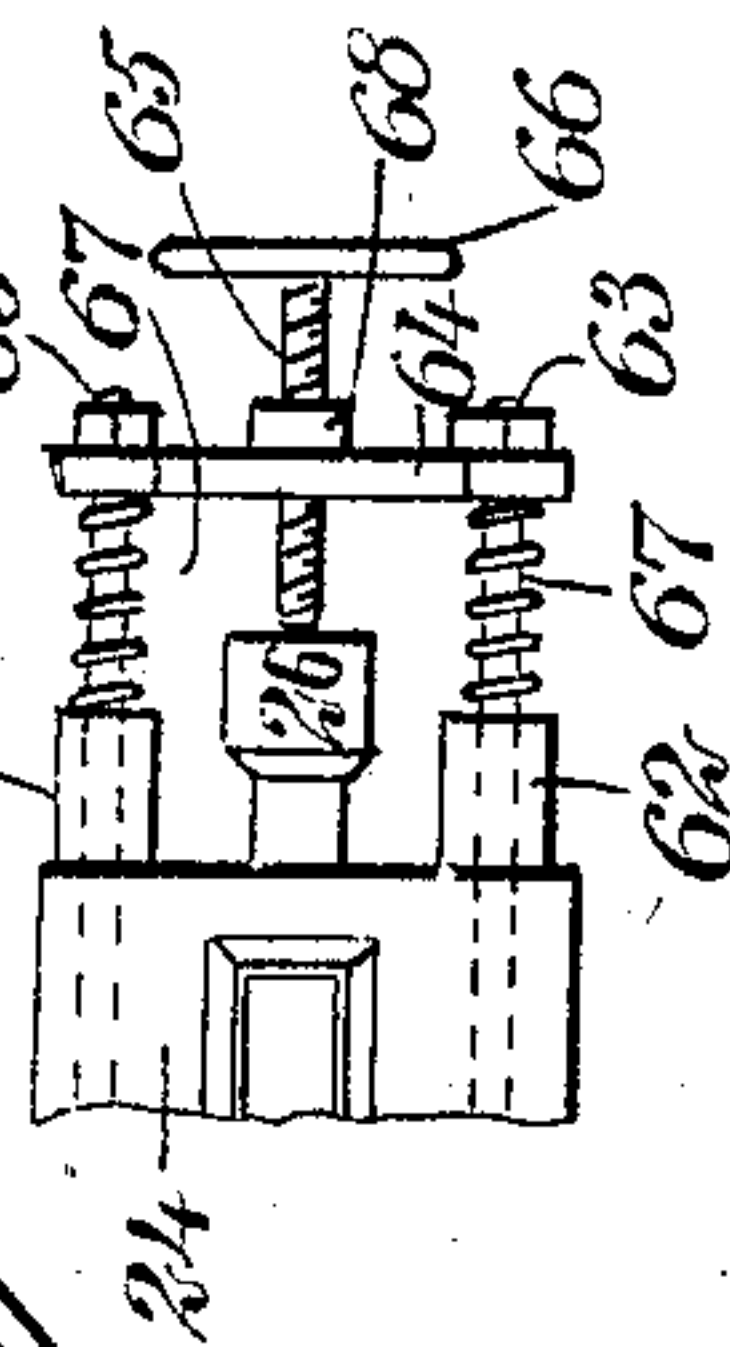


Fig-6

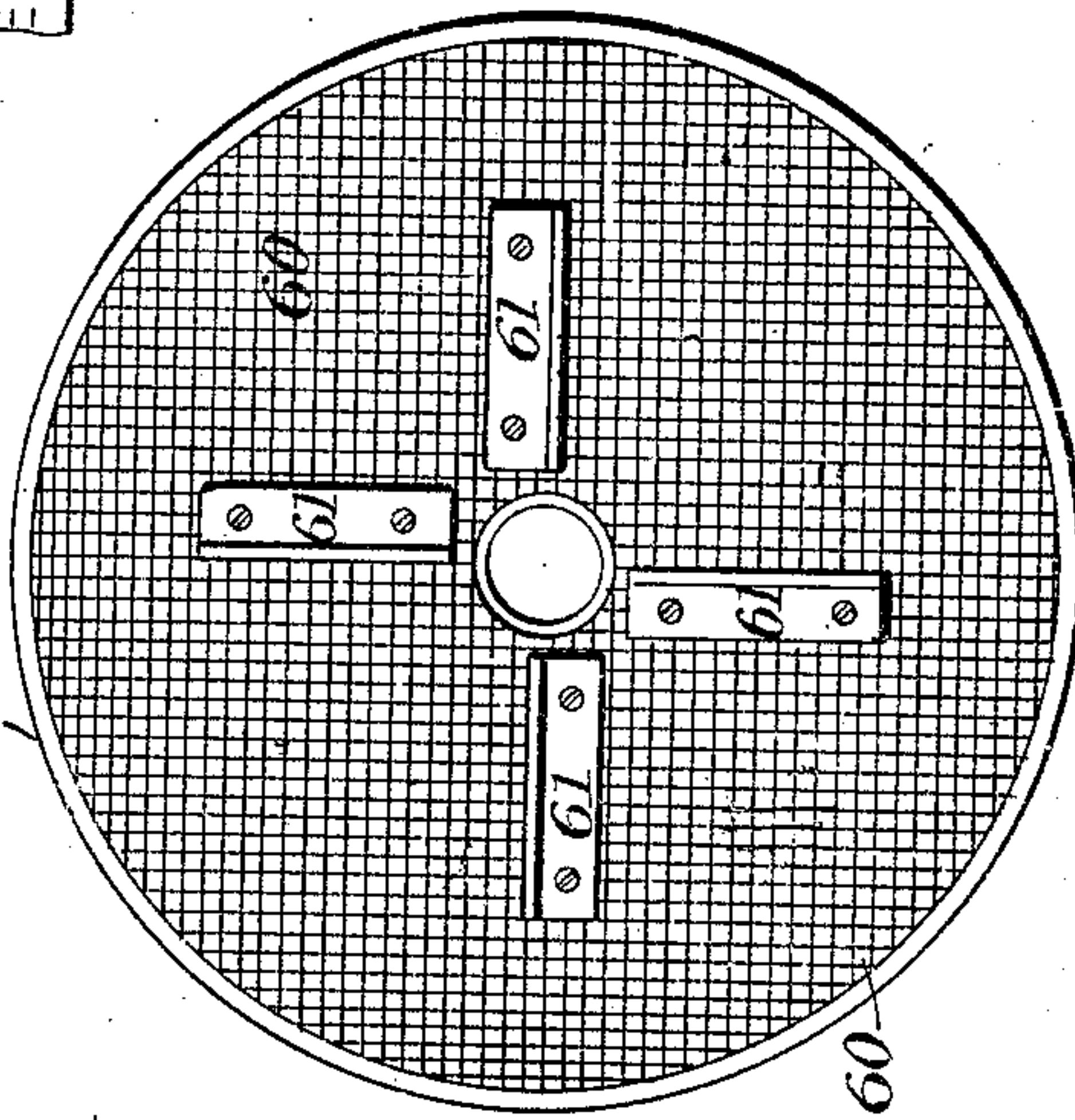
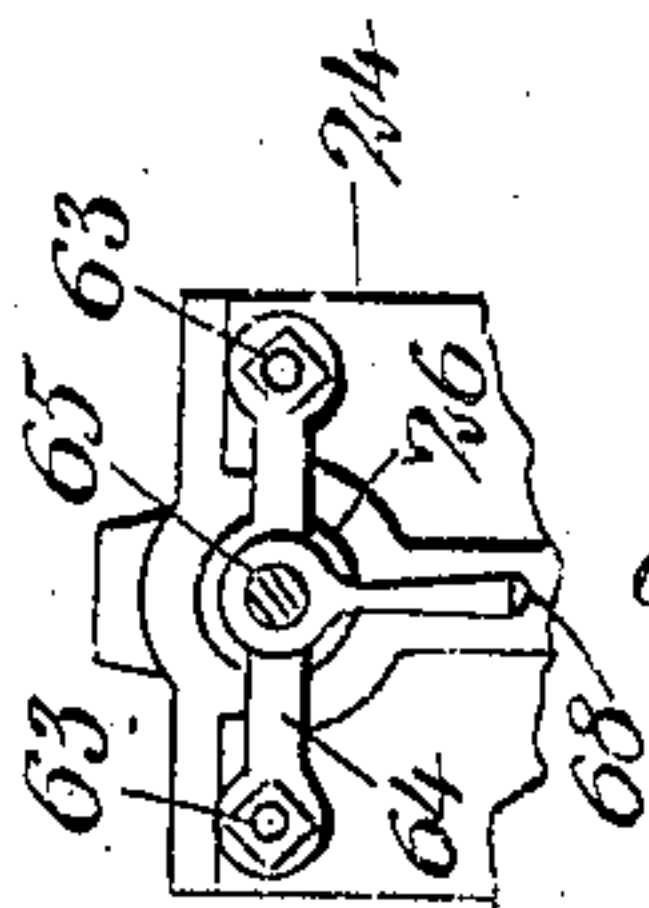


Fig-8



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UNITED STATES PATENT OFFICE.

OCTAVIO DE ALMEIDA CAMARGO, OF RIO CLARO, BRAZIL.

GRAIN SHELLING AND HULLING DEVICE.

No. 836,011.

Specification of Letters Patent.

Patented Nov. 13, 1906.

Application filed February 1, 1906. Serial No. 298,958.

To all whom it may concern:

Be it known that I, OCTAVIO DE ALMEIDA CAMARGO, a citizen of the Republic of Brazil, and a resident of the city of Rio Claro, State of São Paulo, Brazil, have invented new and Improved Grain Shelling and Hulling Devices, of which the following is a full, clear, and exact description.

The invention has reference more especially to devices for shelling and hulling coffee, although equally applicable to the shelling and hulling of other grains or materials; and one of the principal objects thereof is to provide devices for this purpose of an embodiment to overcome numerous disadvantages and objections frequently encountered in the use of many other devices hitherto employed for similar purposes.

A further object of the invention is to provide a device of this kind which is exceedingly simple in general construction, as well as being economic from a manufacturing standpoint, and which is also effective and reliable in operation, possessing the capacity for long and repeated service.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the machine, the section being taken practically on the line 1-1 of Fig. 2. Fig. 2 is a front elevation of the machine, parts being broken away. Fig. 3 is a longitudinal vertical section through the upper portion of the machine, the section being taken practically on the line 3-3 of Fig. 2. Fig. 4 is a section through the hulling-cylinders, the section being taken substantially on the line 4-4 of Fig. 3. Fig. 5 is an inner face view of a stationary grinding-head for the hulling-cylinders. Fig. 6 is an outer face view of the revolving grinding-head forming a portion of the rotating grinding-cylinder, which head is adapted to be opposed to the stationary head shown in Fig. 5. Fig. 7 is a diagrammatic view of a portion of the rotating grinding and hulling cylinder laid flat. Fig. 8 is a detail sectional side elevation of means for adjusting the drive-shaft, the section being taken on the line 8-8 of Fig. 2; and Fig.

9 is a plan view of the mechanism shown in Fig. 8.

The frame of the machine consists of two cheek-pieces 10, one being at the front and the other at the rear, which cheek-pieces are preferably in the form of channel-irons, their flanges facing outward, and supports A, each support comprising an upper bar member 11, on which the cheek-pieces are bolted in any approved manner, and two legs 12, one at the front and the other at the rear, and the legs at each end of the frame are suitably braced and are connected by rods 13 or their equivalents.

A cylindrical body B is supported between the cheek-pieces 10 by means of feet 14, extending from the front to the rear of the said body, which feet are secured in any suitable or approved manner to the upper portions of the cheek-pieces 10. The cylindrical body B is constructed, preferably, in two sections divisible one from the other, and preferably the division is made at the central portion of said body, as is clearly shown in Figs. 2 and 3. The upper section of the body is designated as 15 and the lower section as 16.

At the meeting edges of the sections 15 and 16 of the body B outwardly-extending mating lugs 17 are formed, the mating lugs being secured together by bolts 18 or their equivalents, and at the end portions of the said cylindrical body B apertured lugs 19 are carried outward from the said body at right angles thereto, and the ends of the body B are closed by a left-hand head 20 and a right-hand head 21, the heads being provided with peripheral lugs 23, which are secured to the corresponding lugs 19 on the periphery of the body by suitable bolts 22, as is shown in Figs. 1, 2, and 4.

A drive-shaft C is carried loosely through the fixed cylindrical body B, and said shaft C at its outer ends is journaled in bearings 24, secured to the supports A between the cheek-pieces 10, as is shown in Fig. 2, and at the left-hand end of the shaft C a driving-pulley 25 is secured, which may be accompanied by a loose pulley, if desired, and at the left-hand end of the shaft C an enlargement 26 is formed.

An opening 27 is produced in the upper portion of the right-hand head 20 of the body B, as is best shown in Fig. 4, which opening receives the lower end of an inclined spout 28, secured to a hopper 29 of any suitable description and in which the grain to be hulled

is placed. An opening 30 is made in the upper rear peripheral portion of the casing B, as is shown in Fig. 1, and this opening is surrounded by the enlarged end of a spout 31, which spout has a downward and rearward inclination and is connected with a trunk C', which trunk is located at the rear of the machine, extending above and below the cylindrical body B, being suitably attached to the frame of the machine. This trunk C' is rectangular in cross-section; but its upper end 32 is preferably circular, as illustrated in Fig. 2.

The trunk C' is divided into two sections 33 and 34, the section 33, which is the inner section, being longer than the section 34. The longer section 33 is open at its lower end, while the shorter section 34 has a closed lower end 34^a, and the division in the said trunk is produced by means of a vertical partition which extends from the lower end of the shorter section 34 of said trunk up to within a point near the top of said trunk, said partition 35, as shown in Fig. 2, being usually carried some distance upward above the line of the upper surface of the cylindrical body B, so that the only communication between the two sections 33 and 34 of the trunk C' is at the upper portion of the trunk or above the partition 35. The spout 31, leading from the body B, extends into the upper portion of the longer section 33 of the trunk, as is shown in Fig. 2.

An opening 36 is made in the bottom of the cylinder B, as is shown in Figs. 3 and 4, and at the sides of this opening 36 cheek-pieces 37 and 38 are preferably made integral with the said cylindrical body, extending downward therefrom, which cheek-pieces are usually of segmental shape and extend the length of the opening 36. The cheek-piece 37 is provided with a central opening 37^a therein, and the cheek-piece 38 is provided with a corresponding opening 38^a. Each cheek-piece is provided at its inner face with a marginal flange 39 and at its edge with a peripheral flange 40, as clearly shown in Fig. 4.

A dust-box D is located between the cheek-pieces 37 and 38, the said dust-box being of corresponding shape to the said cheek-pieces—namely, segmental—and the said box D, preferably at its rear end, has a hinged connection 41 with the outer face of the cylindrical body B, as is best shown in Figs. 1 and 3, the other end of the dust-box when in closed position being adapted to engage with the body B at the opposite end of the opening 36, as is clearly shown in Fig. 3, and when the dust-box is in position to practically close the opening 36 its inner end surface will be in engagement with the inner flanges 39 of the cheek-pieces 37 and 38 and the outer end portions of said box will be in

engagement with the peripheral flanges 40 of said cheek-pieces, as is illustrated in Fig. 4.

The top of the dust-box D is covered by a screen 42, which when the dust-box is closed against the cylindrical body forms a direct covering for the opening 36. This box, as its name indicates, is adapted to collect the dust, hulls, and chaff received in the cylindrical body B during the process of cleaning or hulling the grain. The dust-box may be readily emptied or cleaned by dropping the box to the dotted position shown in Fig. 3.

The dust-box D may be held in its upper or normal position in many ways; but by preference a lever D' is employed, which lever has a forked rear end section 43, pivotally connected to lugs 42, extending down from the end portions of the dust-box, as is shown in Fig. 4, and the handle portion of the lever D', which is carried to the front, is pivotally connected to a hook-shaped latch 44, which latch when the dust-box is closed against the body B is carried over the lower flanges of the forward cheek-piece 10 of the frame and is held in position by a thumb-screw 45 or its equivalent.

A pipe 46 is connected with the left-hand cheek-piece 38, extending from the body B at the opening 38^a in said cheek-piece, and the said pipe 46 is likewise carried to a communication with the interior of the shorter section 34 of the trunk C', entering the said section as close as possible to its bottom 34^a. A second pipe 47 is secured in the opening 37^a of the right-hand cheek-piece 37, and this second pipe 47 is carried down to a connection with the casing 48 of an exhaust-fan, the fan being mounted upon a shaft 49, suitably journaled in the lower portion of the frame and provided with a driving-pulley 50.

It may be here remarked that the feed of the material from the hopper 29 to the cylindrical body B is controlled by means of a slide 51, located in the spout 28 of the hopper, being operated from the outside, and the said slide is held in adjusted position by a spring-finger 52, as shown in Fig. 2, and the slide operates upon suitable battens 53, formed within the said spout 28.

In connection with the cylindrical fixed body B, I employ two shelling-heads E and E'. The shelling-head E, which is the outer head, is rigidly secured in the said body, and the head E', which is the inner head, is adapted to revolve within the body. The shelling-head E is secured at its marginal portion to the right-hand head 20 of the said body B by means of screws or bolts 54 or their equivalents, and the said shelling-head E is provided with a central hub, through which the shaft C loosely passes, and with an opening 55, which registers with the opening 27 in the right-hand head of the said body B, through which opening 55 the inner end of

the hopper-spout 28 passes, as is shown in Fig. 4. The shelling-heads E and E' are made to face each other, and the inner or working face of the head E is inclined from the hub 56 inward or in direction of the opposing head E', and adjacent to the periphery of the said fixed shelling-head E a shallow groove 57 is produced in the inner or working face of said head E, and this grooved surface is covered by a wire-mesh cloth 58 or the equivalent thereof, wire-mesh cloth being the covering which is preferred.

A series of radially-disposed distributing-ribs 59 extend from the inner marginal portion of the groove 57 to a point around the hub 56, the said distributing-ribs being arched to a greater or lesser extent, and these ribs are also preferably of solid formation.

The shelling-head E' has its hub portion secured to the shaft C, and the shelling-head E' constitutes the right-hand head for a shelling-cylinder E², the left-hand head 53^a of the said shelling-cylinder being a plain head, as shown in Fig. 4. The rotary shelling-head E' is inclined upon its outer or operating face from its hub to its periphery, the inclination of the working or operating face of the shelling-head E' being outwardly or in direction of the corresponding face of the fixed shelling-head E, as is shown in Fig. 4. Thus it will be observed that the shelling-heads E and E' approach each other quite closely at their peripheral portions and are more or less widely separated at their central or hub portions.

The outer or operating face of the rotary shelling-head E' is covered from its hub to its periphery with wire-mesh cloth 60, and shelling-plates 61 are secured to the working or operating face of the said rotary shelling-head E', which plates are at right angles to the said head and extend from the hub portions to points near the periphery, and the said plates are radially arranged relatively to the hub and are tapering, being narrowest at their outer ends; but the longitudinal working edges 61^a of the plates 61 are straight, as is clearly shown in Fig. 4, the arrangement of the plates or blades being best shown in Fig. 6.

The ribs 59 serve to distribute the coffee or other grain fed between the two shelling-heads and cause the grain to circulate and approach the outer edges of the heads E and E', the plates or blades 61 acting in conjunction with the ribs 59 to initially shell the grain, and the hulls of the grain which escape the action of the central portion of the shelling-heads are removed, as the grain reaches the peripheral portions of said heads, by rolling contact with the abrading-surfaces at such portions of said shelling-heads.

The shaft C is spring-cushioned at its left-hand end, so that if a hard object, such as a

stone, should find its way with the grain between the shelling-heads E and E', the said heads will not be injured, since the shaft C, carrying the rotating-head E', would move endwise until such object was freed, and then the spring-cushion will return the shaft and the head carried thereby to its normal position. It is also advisable at times to adjust the rotating shelling-head E' relatively to the fixed shelling-head E, so that large or small beans or grain can be accommodated. Such adjustments are made as illustrated in Figs. 2, 8, and 9, wherein it will be observed that the left-hand journal-box 24 is provided with outwardly-extending sleeves 62 at its ends, and rods 63 are passed through said sleeves into the journal-box 24, where the said rods are secured, and the rods 63 are passed through eyes at the end of a connecting-bar 64, and the threaded stem 65 of a wheel 66 is passed through the central portion of the said connecting-bar to a bearing against the enlarged left-hand end 26 of the said shaft C. Springs 67 are coiled around the outer ends of the rods 63, having bearing against the ends of the sleeves 62 and against the connecting-bar 64, which latter is held in place by nuts on the ends of the rods 63. After adjustment of the shaft has been made the shaft is held in its adjusted position by means of a lock-nut 68, mounted on the threaded stem of the wheel 66, and as the two shelling-heads E and E' are brought together by such adjustment the tension of the springs 67 is increased.

The suction in the trunk C' is regulated by producing an opening 69 in one of its sides, as is shown best in Fig. 1, which opening is regulated by means of a sliding gate or damper 70, and it may be here remarked that the fan-shaft 49 is driven from the drive-shaft C by placing a pulley 71 on the left-hand end portion of the drive-shaft, which pulley is belted to the pulley 50 on the fan-shaft.

At the left-hand end of the peripheral portion of the shelling-cylinder E² directing-blocks 72 are externally secured, occupying a diagonal position on the said periphery of the said cylinder, as is best shown in Figs. 3 and 7, and these blocks have their edges more or less beveled, and their inner ends are inclined down to the surface of the shelling-cylinder E² to meet directing-plates 74, also exteriorly secured to the outer face of the cylinder, which plates are diagonally arranged also, and at the opposite or left-hand end of the cylinder stop-plates 75 are placed in order to prevent the shelled products from passing off at said right-hand end of the cylinder, since when the shelling-cylinder E² revolves the grains and hulls are gathered by the directing-blocks 72, which closely approach the inner face of the cylindrical body B and direct the said material to the directing-plates, which carry the material upward until the

opening 30 is reached in the cylindrical casing B, whereupon the shelled material and the hulls or husks are forced into the spout 31, and from said spout they are drawn by suction into the trunk C', where the grains, being heavy, drop down through the longer section 33 thereof and down to the bottom of said section, while the hulls and other light particles are sucked down into the shorter section 34 and are drawn from thence through the dust-box D to the pipe 47 and finally reach the fan-casing 48, where they are discharged into the atmosphere.

It may sometimes happen that the beans or grain will not be entirely shelled by the action of the ribs 59, the plates 61, and the abrasive facings on the shelling-heads E and E'. Therefore at the front lower portion of the fixed cylindrical body B a horizontal slot 77 is made, and a shelling-plate 76 is passed through the said slot into the space between the fixed cylindrical body B and the hulling or shelling cylinder E², as is best shown in Fig. 3. This shelling-plate 76 is adjustable and rests upon studs 78, secured to or constituting an integral portion of the upper flange of the front cheek-piece 10 of the frame, and the plate is provided above said studs with slots 80, through which bolts are passed into the said studs. Eyes 82 are formed at the end portions of the shelling-plate 76, and set-screws 81 are passed through these eyes to a bearing against the outer face of the cylindrical body B. In this manner the shelling-plate 76 is rendered adjustable and can be held in adjusted position, and, if desired, the set-screws 82 may enter suitable taps in said cylindrical body.

In the operation of the shelling plate or blade 76 as the grain or beans are carried around and up to be discharged, they will be subjected to the abrasive or shelling action when the directing-blocks 72 pass the said plate 76, thus insuring all of the beans or grain being properly relieved from shells or hulls. Thus it will be observed that the two heads E and E' perform the initial or rough work of shelling and that the shelling-cylinder E², its directing-blocks, and the shelling blade or plate 76 finish the shelling operation.

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

1. A device for shelling and hulling coffee and the like comprising a cylindrical casing, a shelling-head secured to one end thereof, a shaft journaled in the casing, a cylinder secured to the shaft and provided at one end with a shelling-head cooperating with the shelling-head of the casing, directing blocks and plates upon the periphery of the cylinder, an adjustable shelling-blade cooperating with the directing blocks and plates, and a trunk divided into two sections independent at the bottom and connected at the top, one of said

sections being connected with the casing, and an exhaust-fan connected with the other section.

2. A device for shelling and hulling coffee and the like comprising a casing, a shelling-head secured to one end thereof, a shaft journaled in the casing, a cylinder secured to the shaft and provided at one end with a shelling-head cooperating with the shelling-head of the casing, directing blocks and plates upon the periphery of the cylinder, and an adjustable shelling-blade cooperating with the directing blocks and plates, said shaft being mounted to yield in one direction, whereby to permit the separating of the shelling-heads.

3. A device for shelling and hulling coffee and the like comprising a casing, a shelling-head secured to one end thereof, a shaft journaled in the casing and mounted to yield with respect to the casing and provided at one end with a shelling-head cooperating with the shelling-head of the casing, directing blocks and plates upon the periphery of the cylinder, an adjustable shelling-blade cooperating with the directing-blocks, a trunk comprising two sections independent at the bottom and connected at the top, one of said sections being connected with the casing, an exhaust-fan connected with the other section, and a dust-box communicating with the casing and with said last-named section of the trunk.

4. In a device for shelling and hulling coffee and the like, a stationary casing, a shelling-head rigidly supported therein, a rotatable shaft extending through bearings in said head and in opposing walls of the casing, a second shelling-head mounted to rotate with the said shaft, the two shelling-heads being dished in opposite directions, their dished or working faces being provided with abrading-surfaces embodying rings of peripherally-located wire-gauze and projections from their hub portions, the said casing being provided with an opening in one of its ends, the stationary shelling-head being provided with a corresponding opening, a hopper extending through the said opening, the said casing being provided with another opening at its upper portion at the opposite end, a spout connected with the said upper opening, a trunk divided into two sections, independent at the bottom and connected at the top, one of which sections is connected with the said spout, and an exhaust-fan connected with the said trunk.

5. In a device for shelling and hulling coffee and the like, a stationary casing having an opening at one end and an opening at the top at the other end, a shelling-head secured at one end portion of the said casing and provided with an opening registering with that in the end portion of the casing, a hopper which is carried through the end opening in the said casing and corresponding opening in

the said shelling-head, a shaft mounted to revolve in bearings in the casing and in the said fixed shelling-head, a second shelling-head secured to the said shaft, the opposing or
 5 working faces of the two heads being dished in opposite directions and provided with opposing abrading-surfaces embodying rings of wire-gauze, a cylinder secured to the said shaft within the casing, a rotatable shelling-
 10 head constituting an end portion of said cylinder, diagonal directing-blocks secured to the peripheral portion of said rotatable cylinder, extending to the shelling-head thereof, and diagonal plates or blades of lesser depth
 15 extending from the said blocks to the opposite end, whereby to carry the material from the casing to the upper opening therein, a trunk divided into two sections connected at the top, one section being closed at the bot-
 20 tom and the other section open at the bottom, a spout connecting the upper section of the trunk with the said casing at its upper opening, and an exhaust-fan connected with the closed section of the trunk, all operating
 25 substantially as described.

6. In a device for shelling and hulling coffee and the like, a stationary casing having an opening at one end and an opening at the top, a shelling-head secured at one end por-
 30 tion of the said casing and provided with an opening registering with that in the end portion of the casing, a hopper which is carried through the end opening in said casing and the corresponding opening in said shelling-
 35 head, a shaft mounted to revolve in bearings in the casing and in the said fixed shelling-

head, a second shelling-head secured to the said shaft, the opposing or working faces of the two heads being dished in opposite direc-
 40 tions and provided with opposing abrading-surfaces embodying rings of wire-gauze, a cylinder secured to the said shaft within the casing, the rotatable shelling-head constitut-
 45 ing an end portion of said cylinder, diagonal directing-blocks secured to the peripheral portion of said cylinder, extending to the shelling-head thereof, and diagonal plates or blades of lesser depth extending from the said
 50 blocks to the opposite end, whereby to carry the material from the casing to the upper opening therein, a trunk divided into two sections connected at the top, one section being closed at the bottom and the other section
 55 open at the bottom, a spout connecting the open section of the trunk with the said casing at its upper opening, an exhaust-fan connected with the closed section of the trunk, and an adjustable shelling-blade mounted
 60 outside of the casing and extending within the same, which adjustable shelling-blade is adapted to coact with the directing-blocks on the said rotatable cylinder to finally act upon the beans or grain in the hulling opera-
 tion.

In testimony whereof I have signed my
 65 name to this specification in the presence of two subscribing witnesses.

OCTAVIO DE ALMEIDA CAMARGO.

Witnesses:

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 YORDÃO CORRÊA.