425-348

No. 712,473. Patented Nov. 4, 1902.

G. S. BAKER.

SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 1.

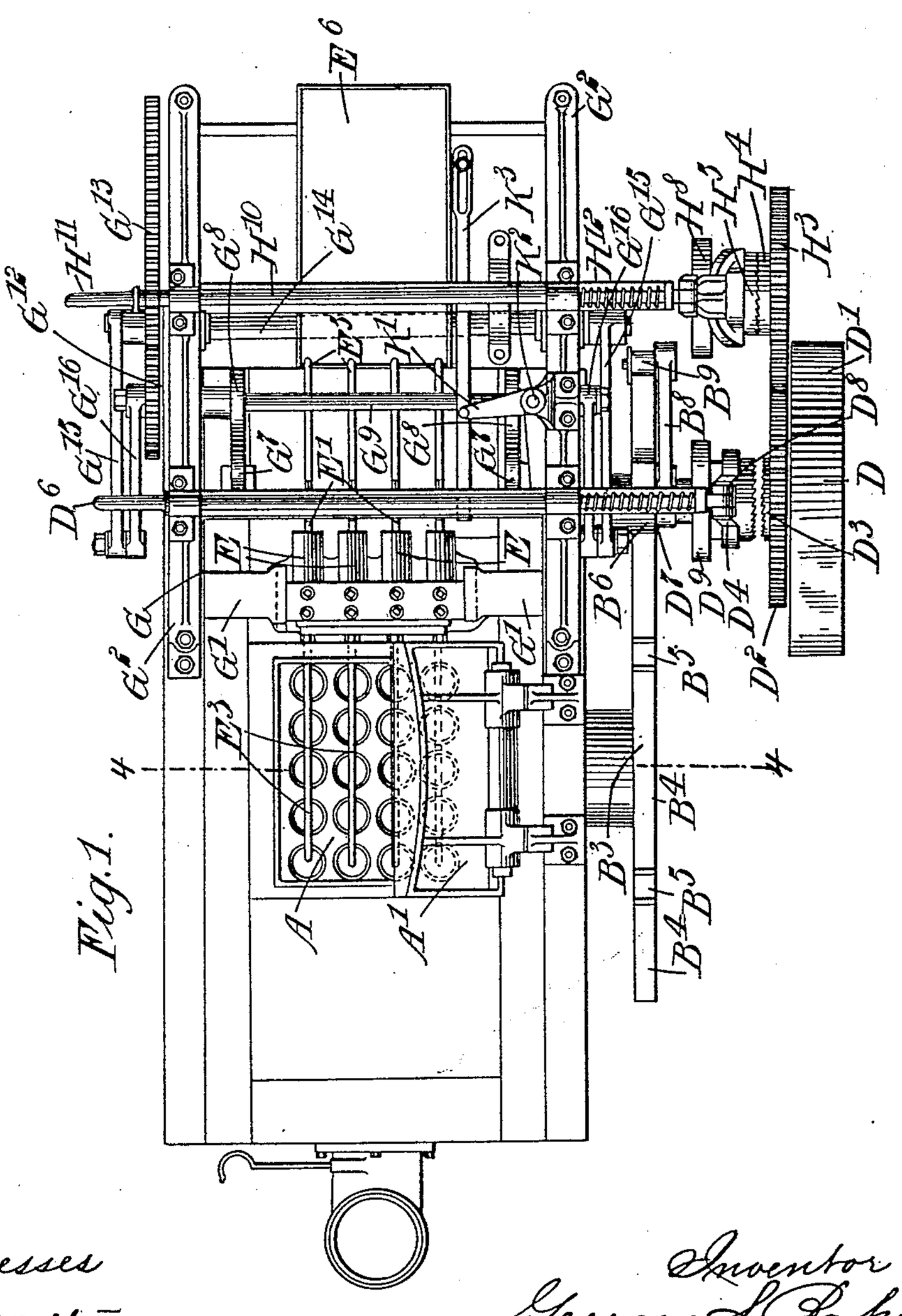

Fig. 1.

Witnesses
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4

No. 712,473. Patented Nov. 4, 1902.

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(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 2.

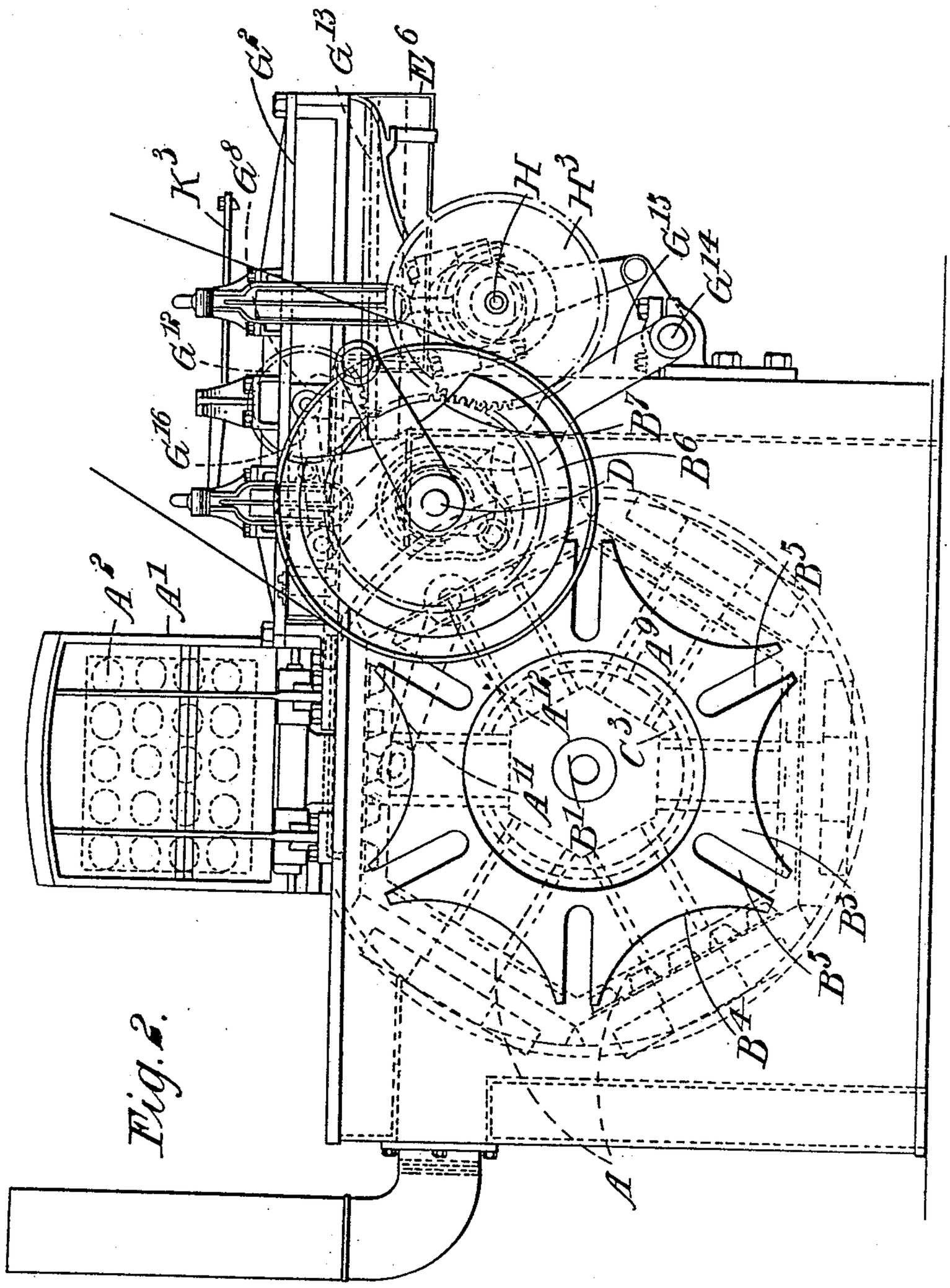

Fig. 2.

Witnesses
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No. 712,473. Patented Nov. 4, 1902.

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SUGAR WAFER BISCUIT MACHINE.

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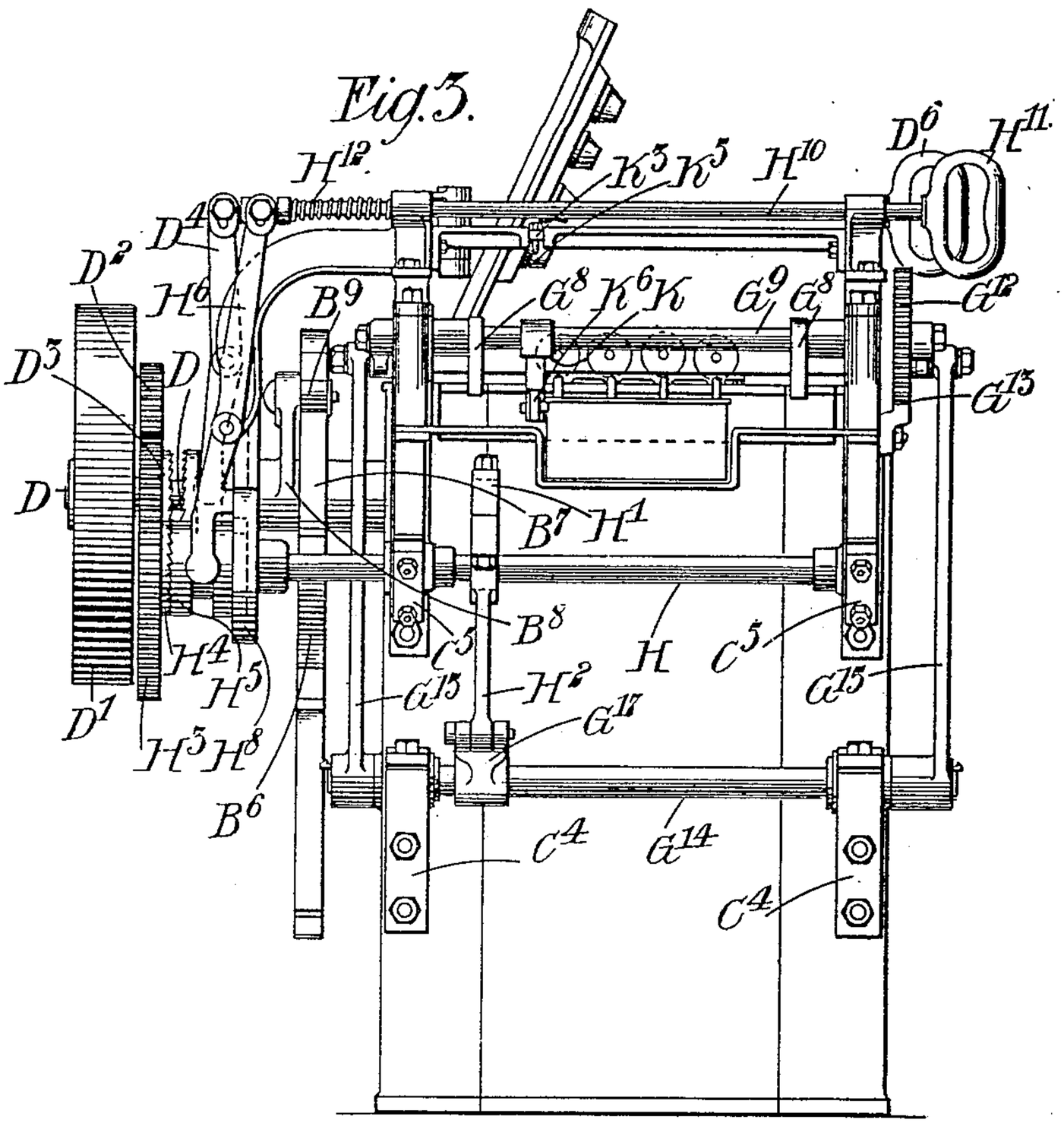
(No Model.) 13 Sheets—Sheet 3.

Fig. 3.



Witnesses
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No. 712,473. Patented Nov. 4, 1902.

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(Application filed June 16, 1902.)

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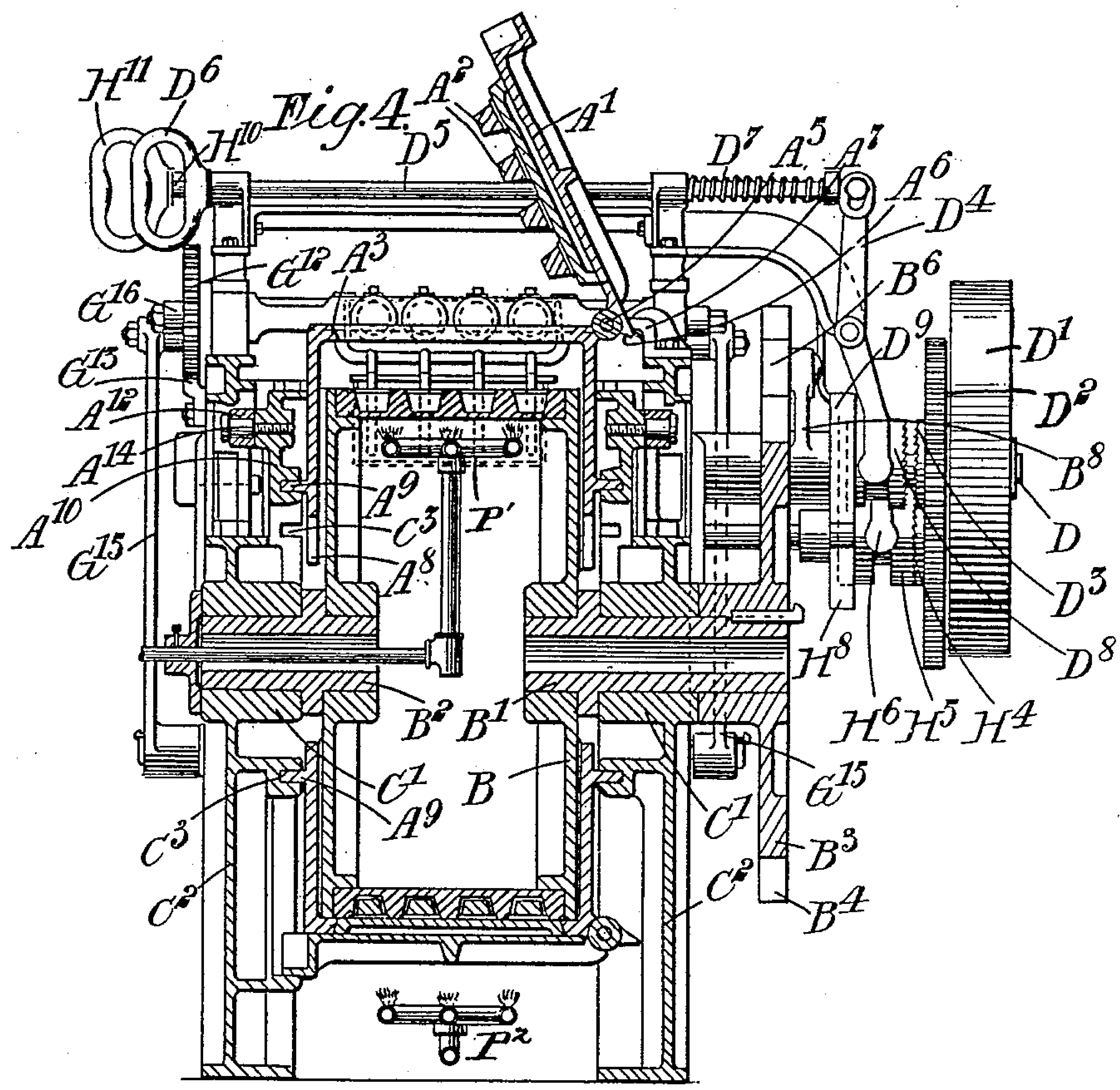

Witnesses
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[illegible]

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No. 712,473. Patented Nov. 4, 1902.

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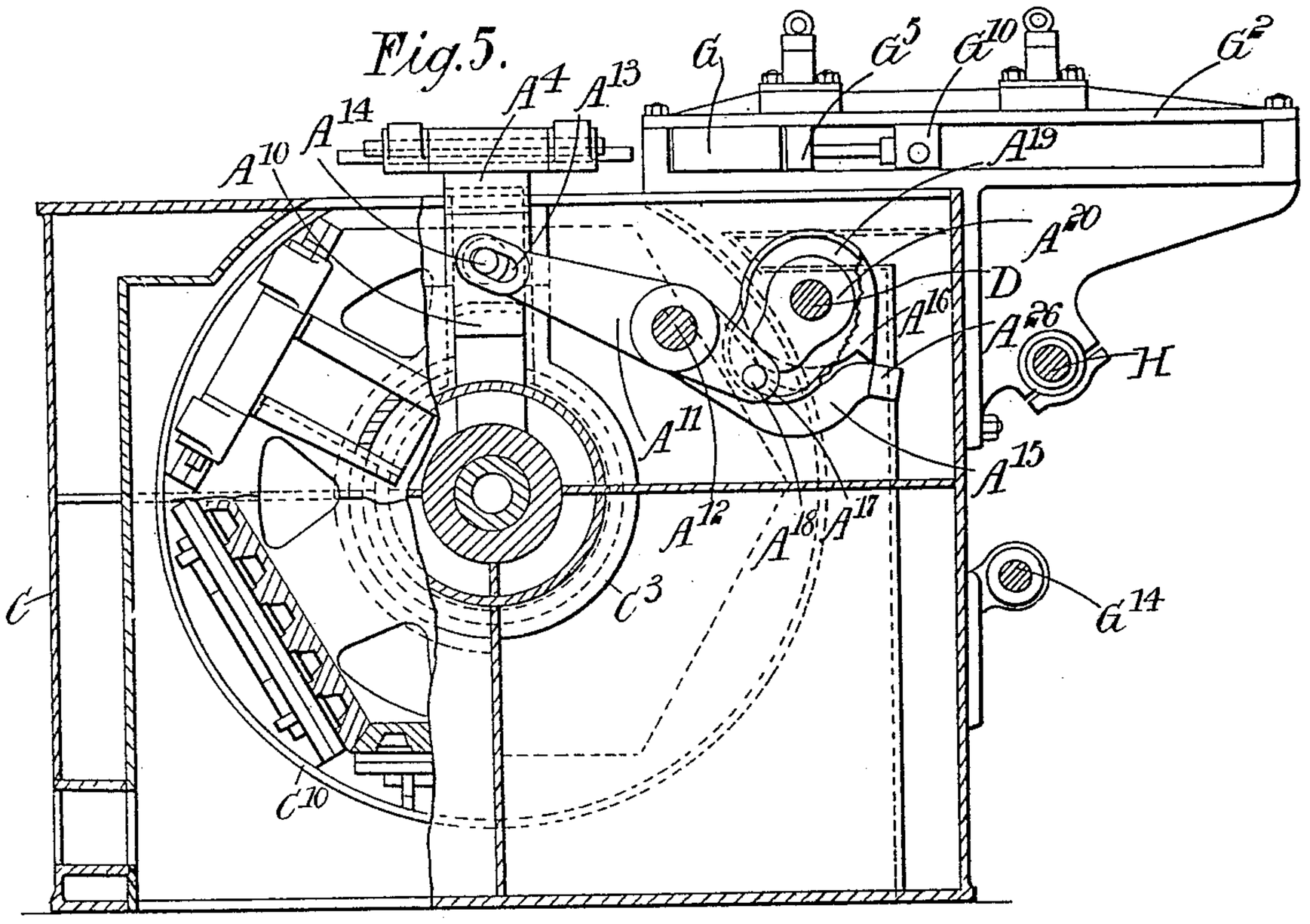
SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 5.

Fig. 5.



Witnesses
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No. 712,473. Patented Nov. 4, 1902.

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SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 6.

Fig. 7.

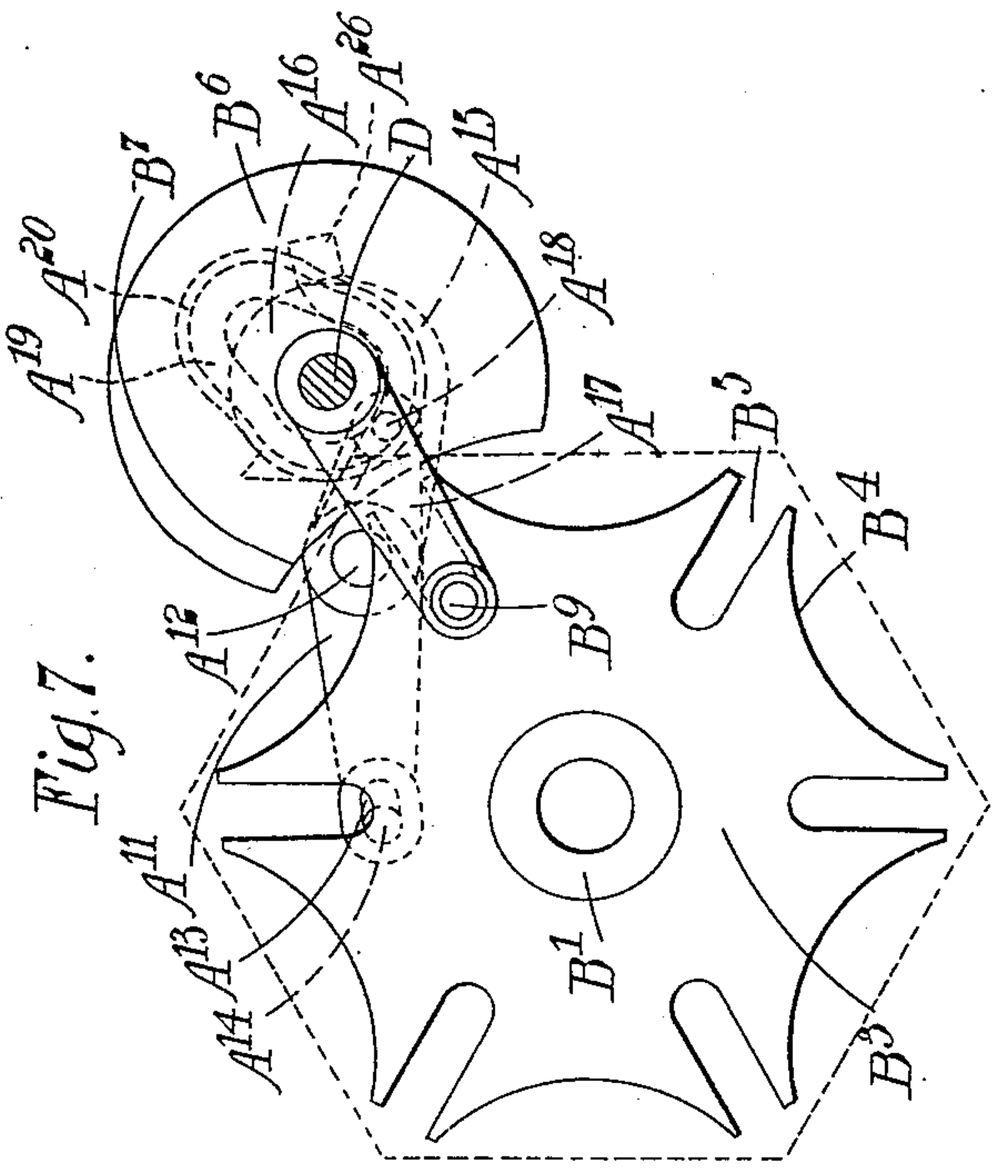
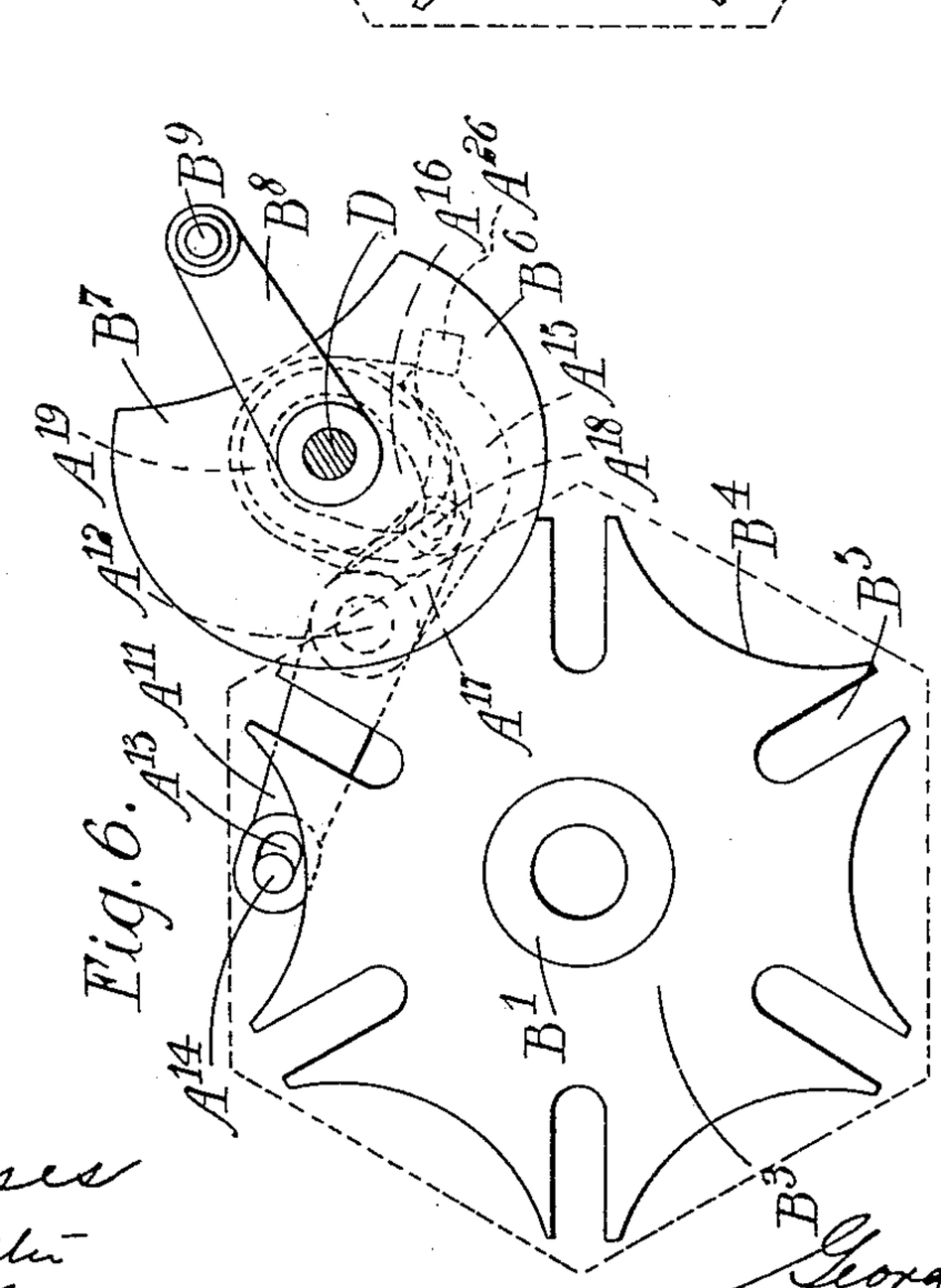


Fig. 6.



Witnesses
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No. 712,473. Patented Nov. 4, 1902.

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SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 7.

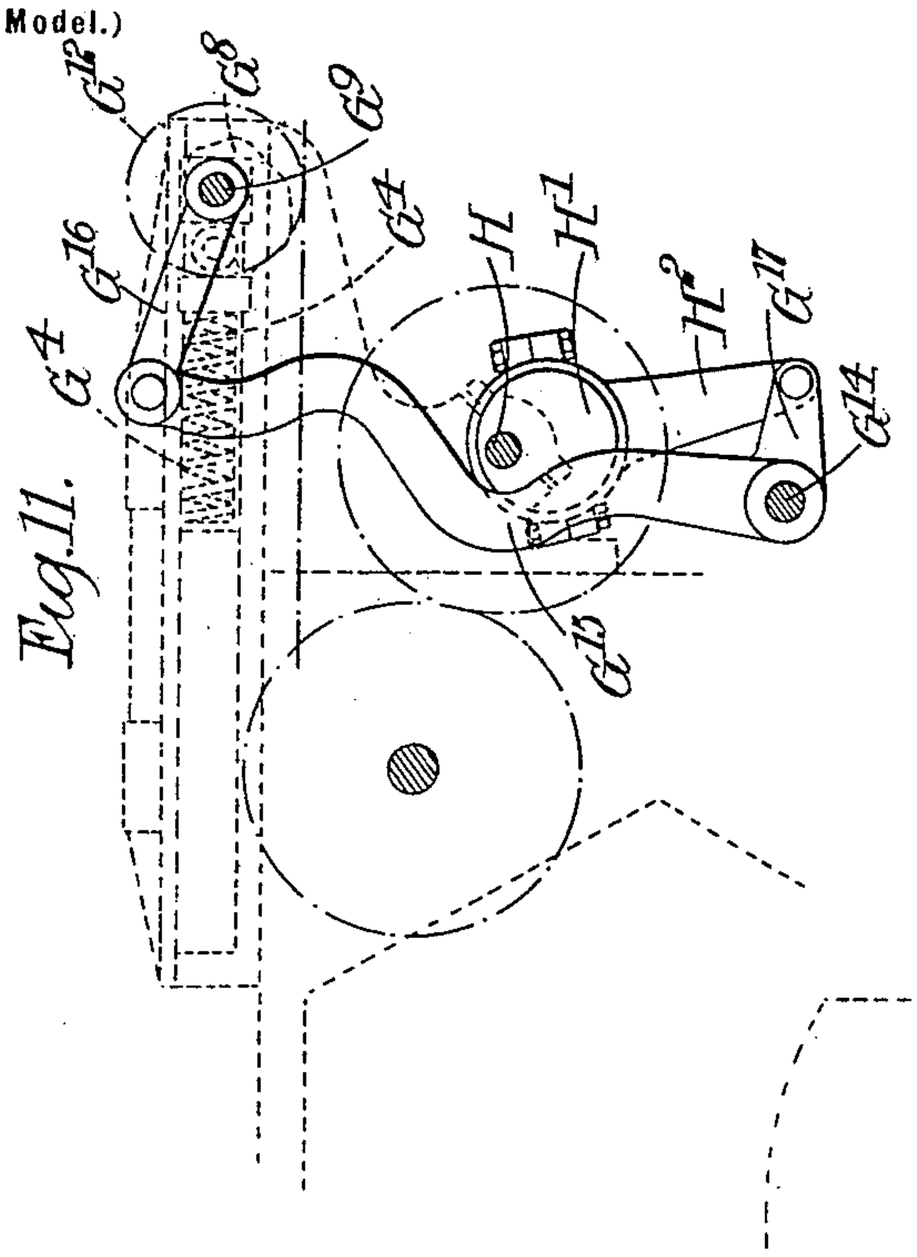

Fig. 11.

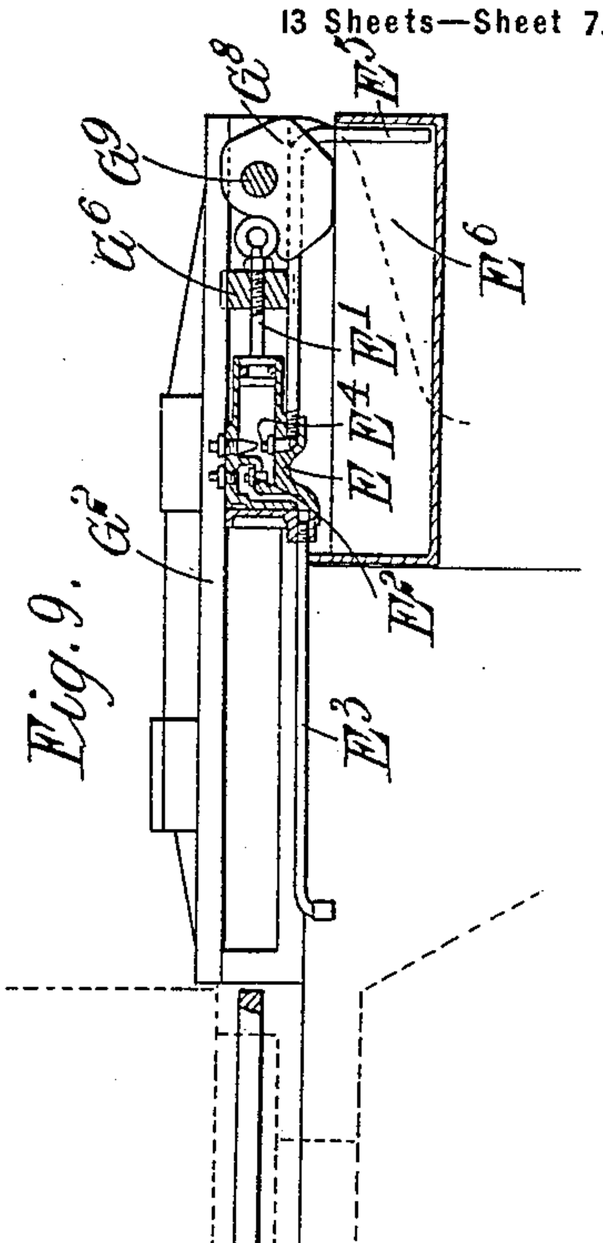

Fig. 9.

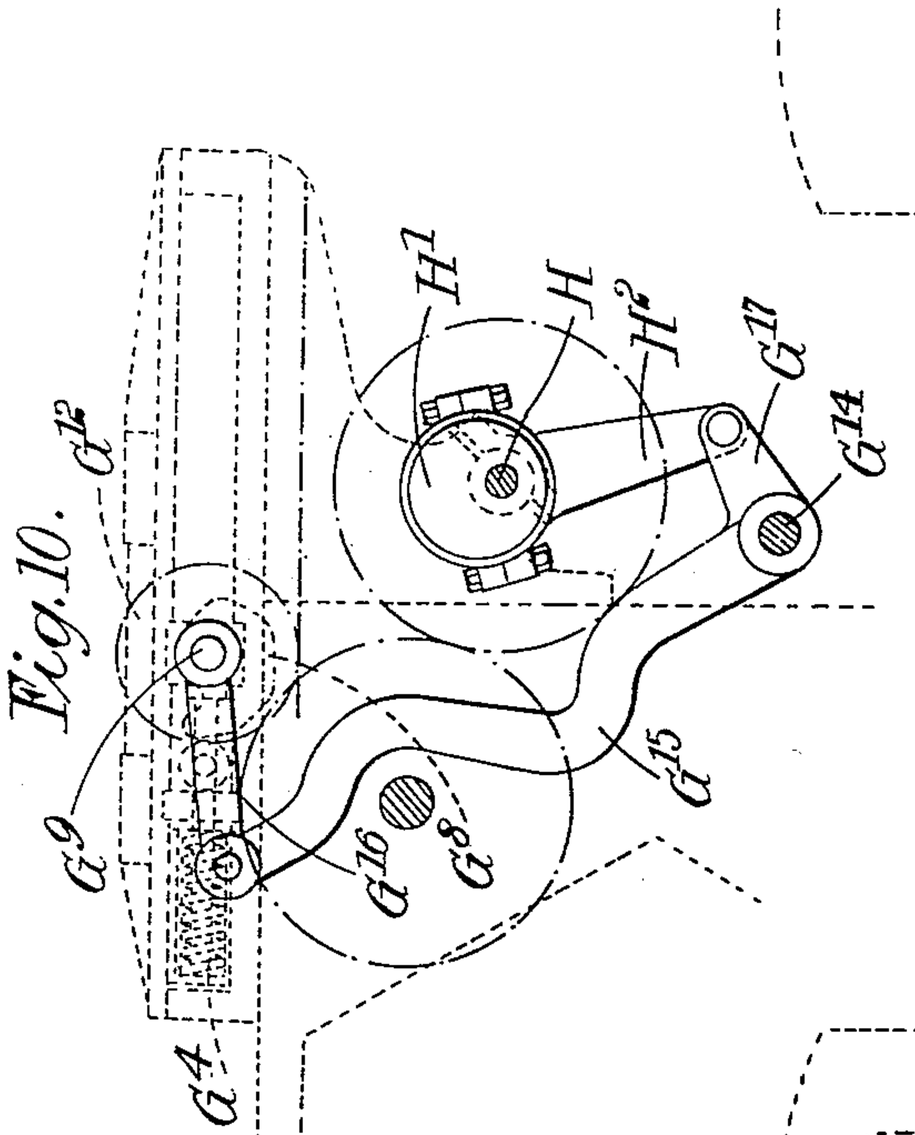

Fig. 10.

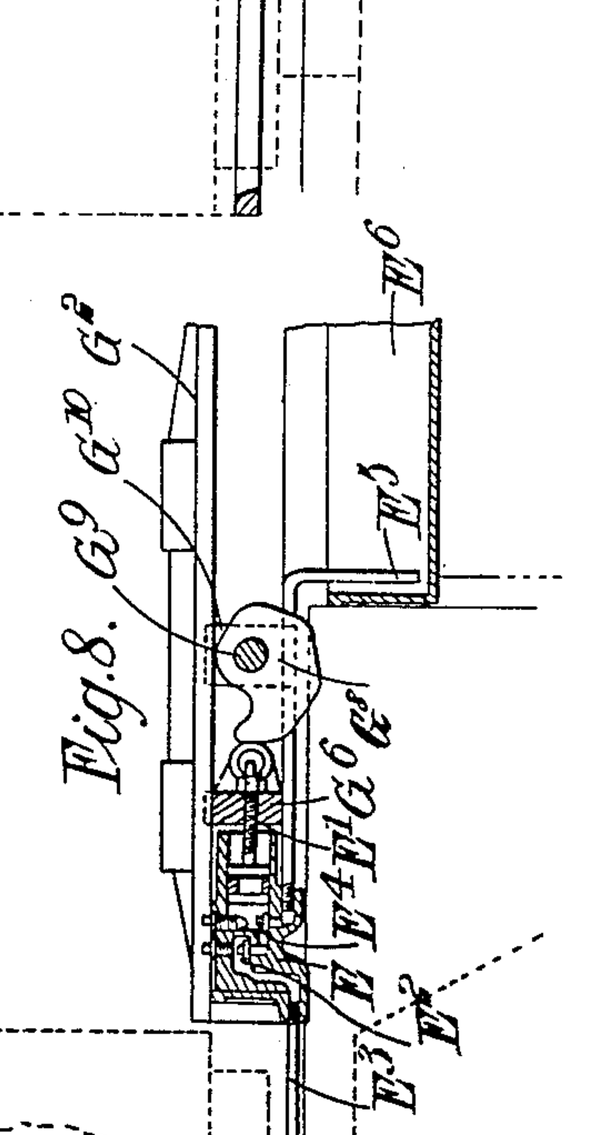

Fig. 8.

Witnesses
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No. 712,473. Patented Nov. 4, 1902.

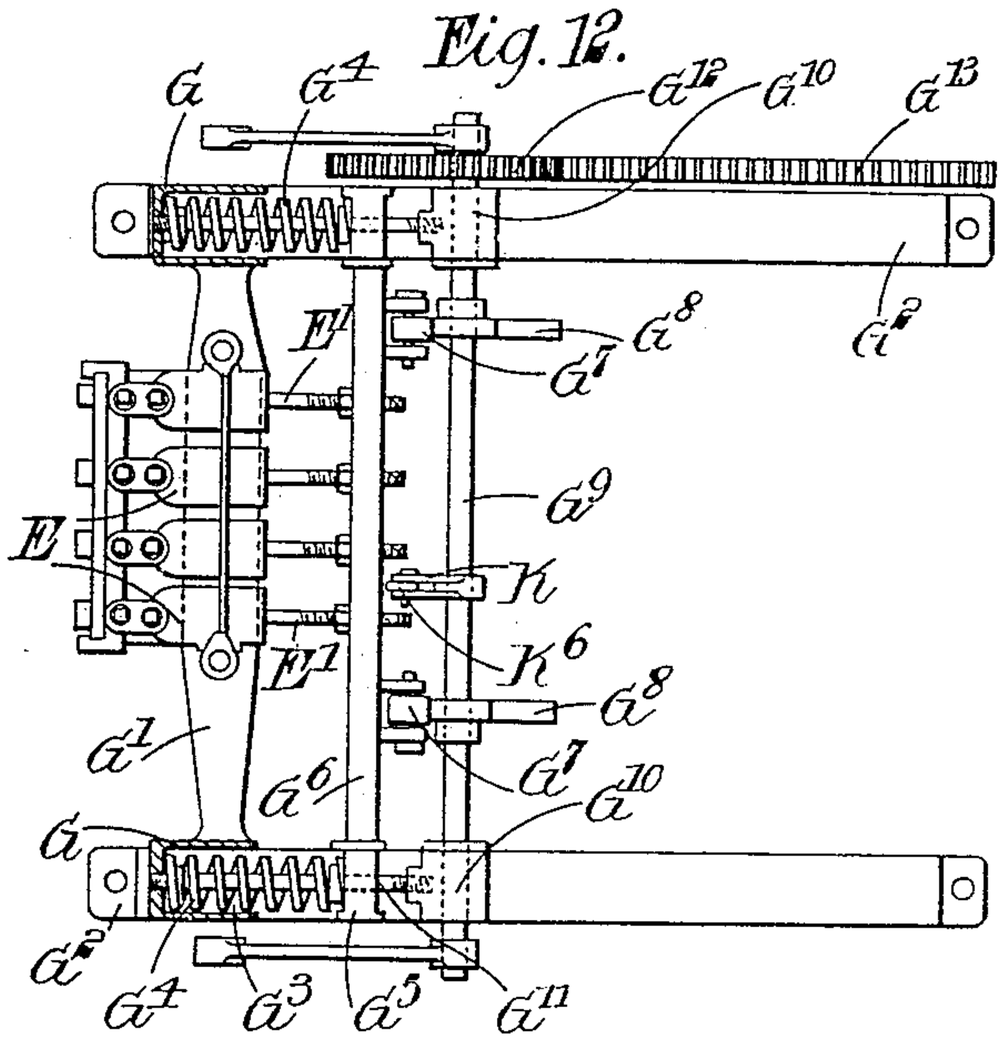
G. S. BAKER.

SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 8.

Fig. 12.



Witnesses
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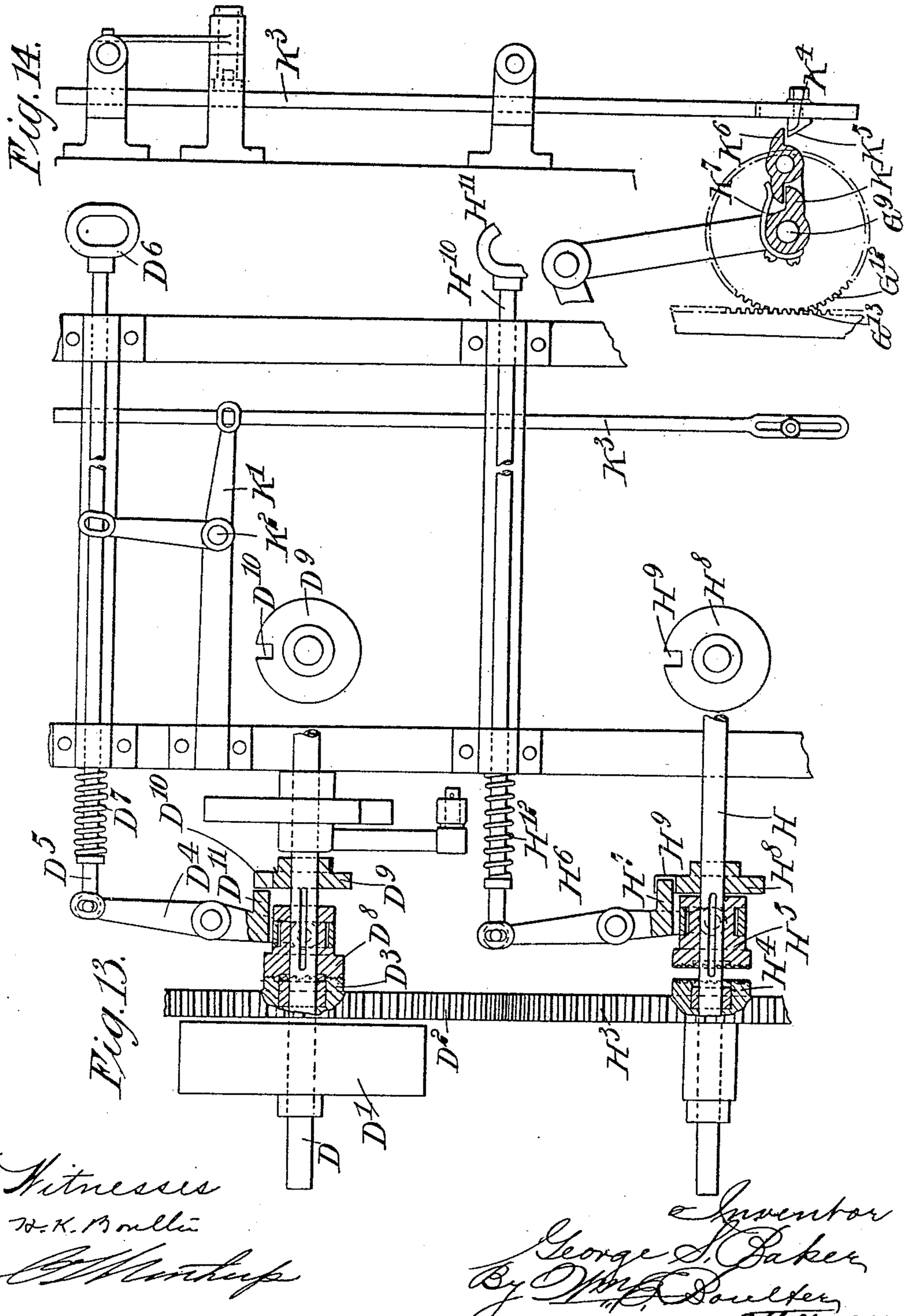
No. 712,473. Patented Nov. 4, 1902.

G. S. BAKER.

SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 9.



Witnesses
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No. 712,473. Patented Nov. 4, 1902.

G. S. BAKER.

SUGAR WAFER BISCUIT MACHINE.

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(No Model.) 13 Sheets—Sheet 10.

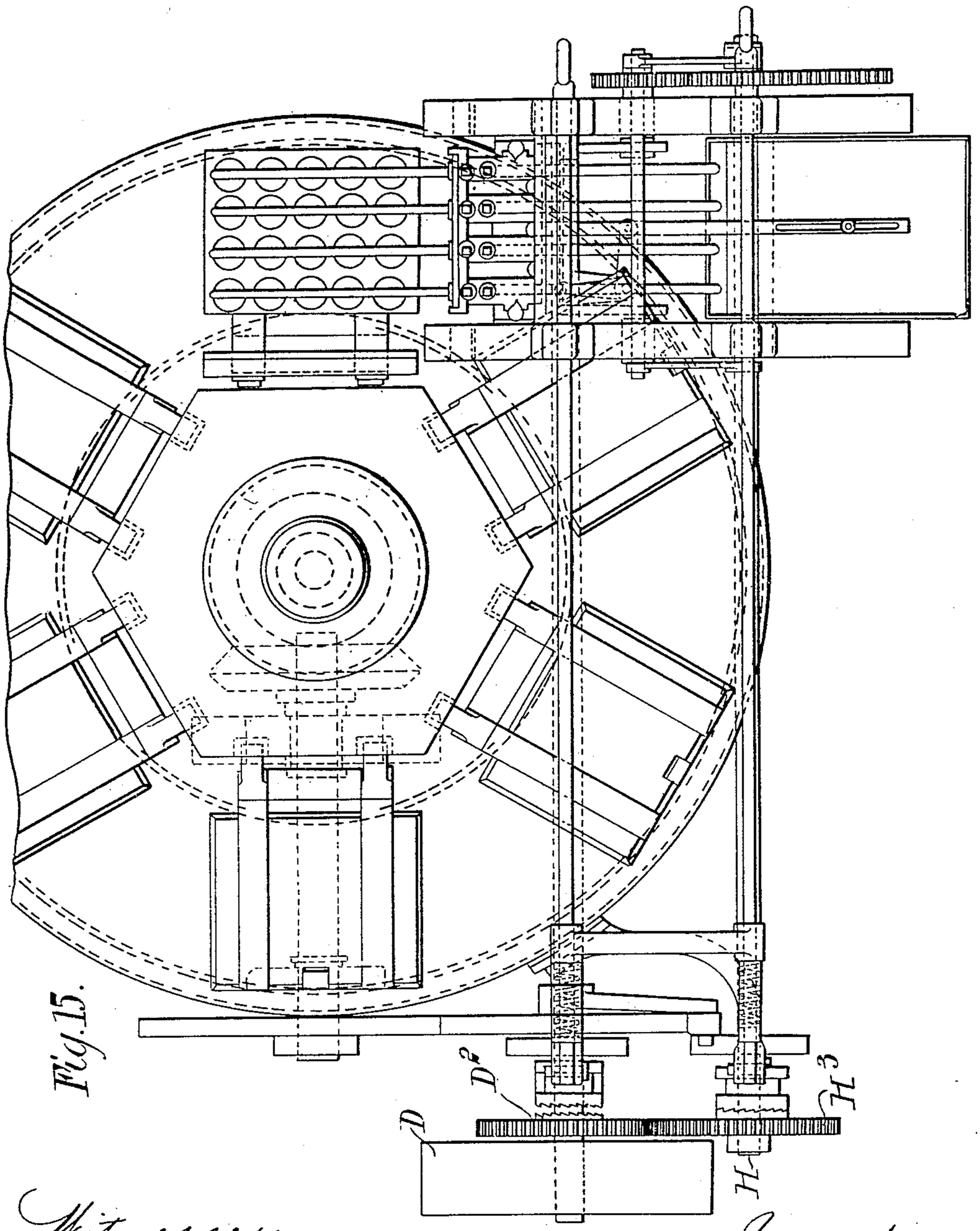

Fig. 15.

Witnesses
H. K. Boulter
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107. BREAD, PASTRY, & CONFECTION MAKING.
Combined machines.

No. 712,473. Patented Nov. 4, 1902.

G. S. BAKER.

SUGAR WAFER BISCUIT MACHINE.

(Application filed June 16, 1902.)

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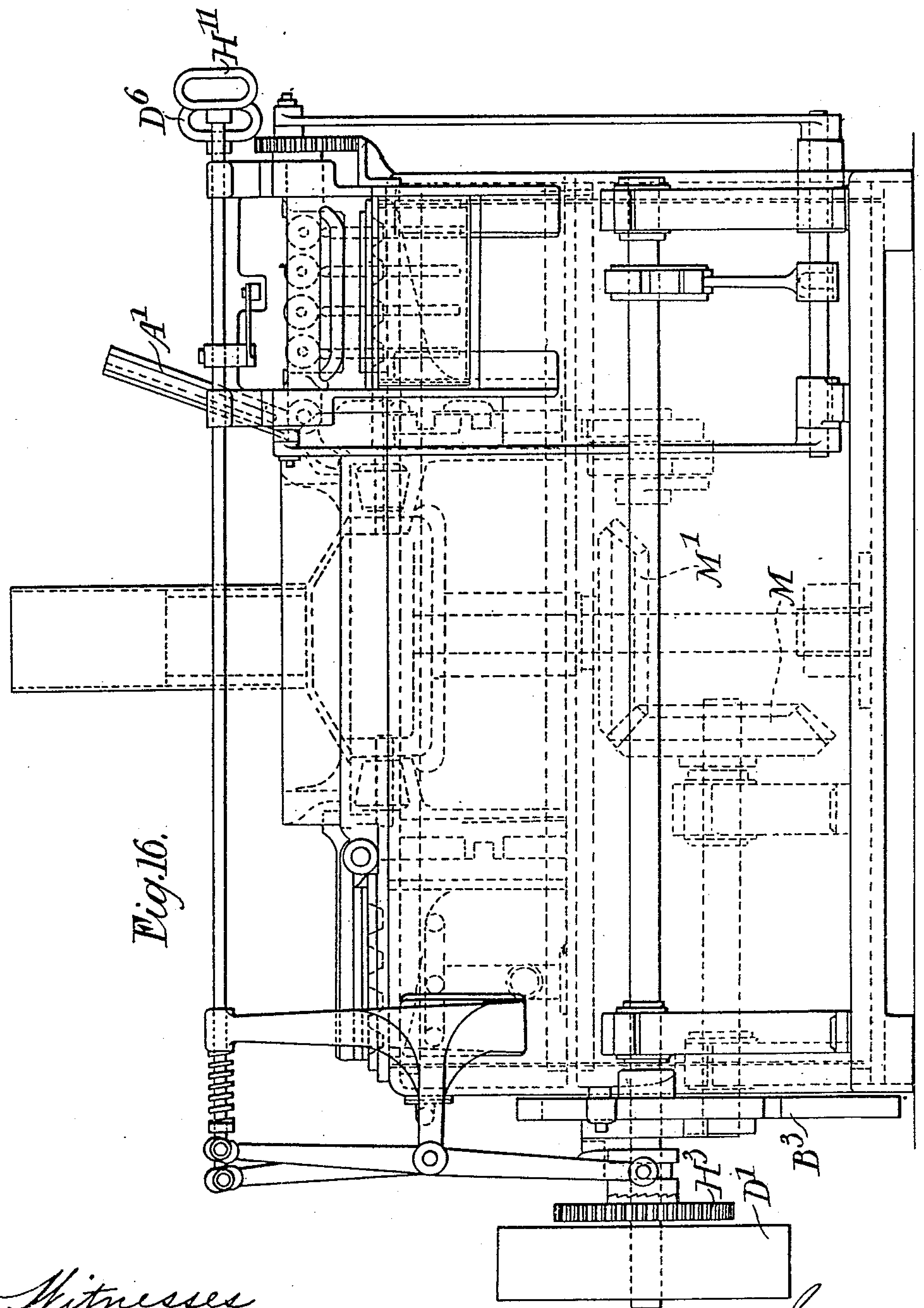

Fig. 16.

Witnesses
W. H. Borelli
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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G. S. BAKER.

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(Application filed June 16, 1902.)

(No Model.) 13 Sheets—Sheet 12.

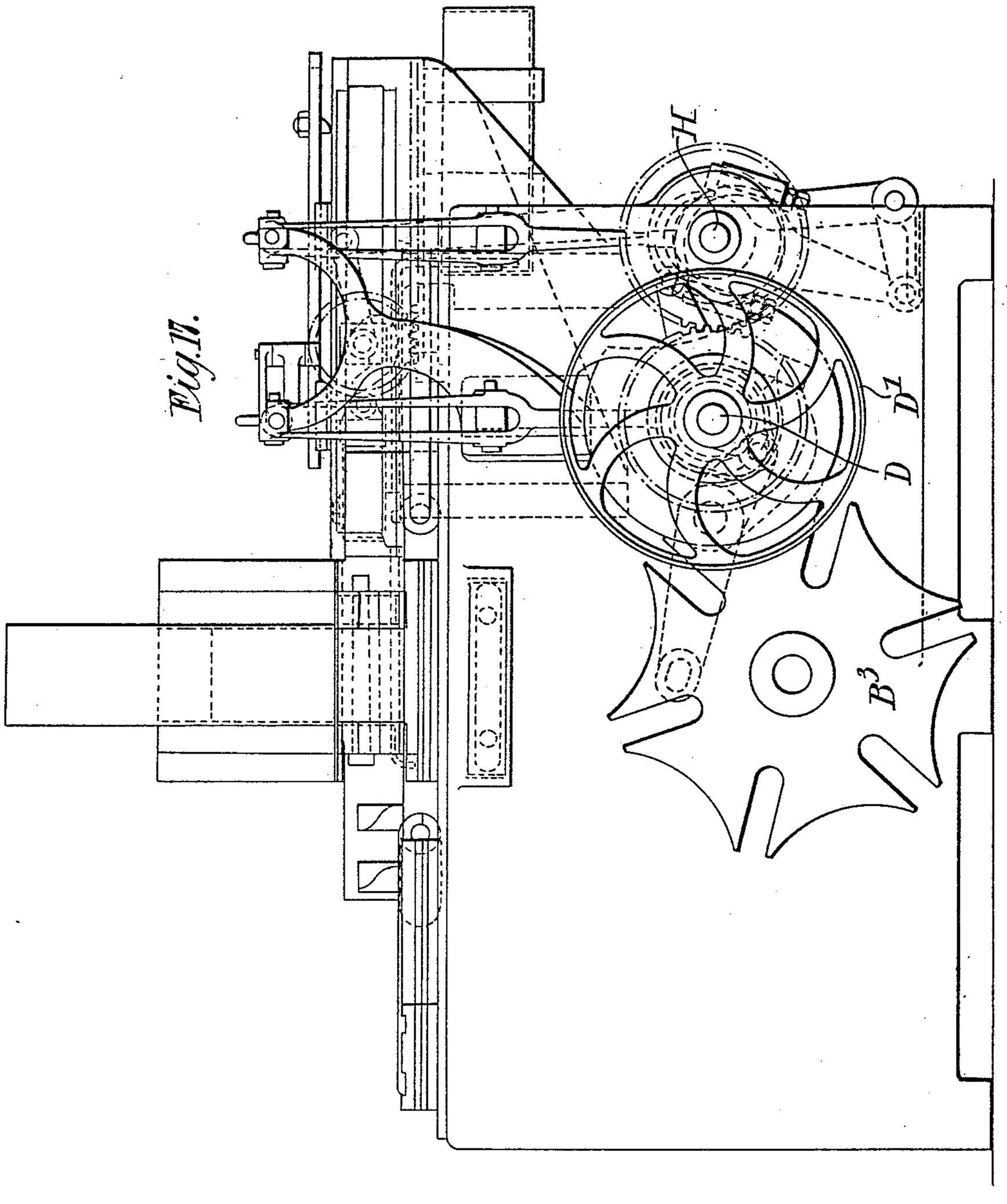

Fig. 11.

Witnesses
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No. 712,473. Patented Nov. 4, 1902.

G. S. BAKER.

SUGAR WAFER BISCUIT MACHINE.

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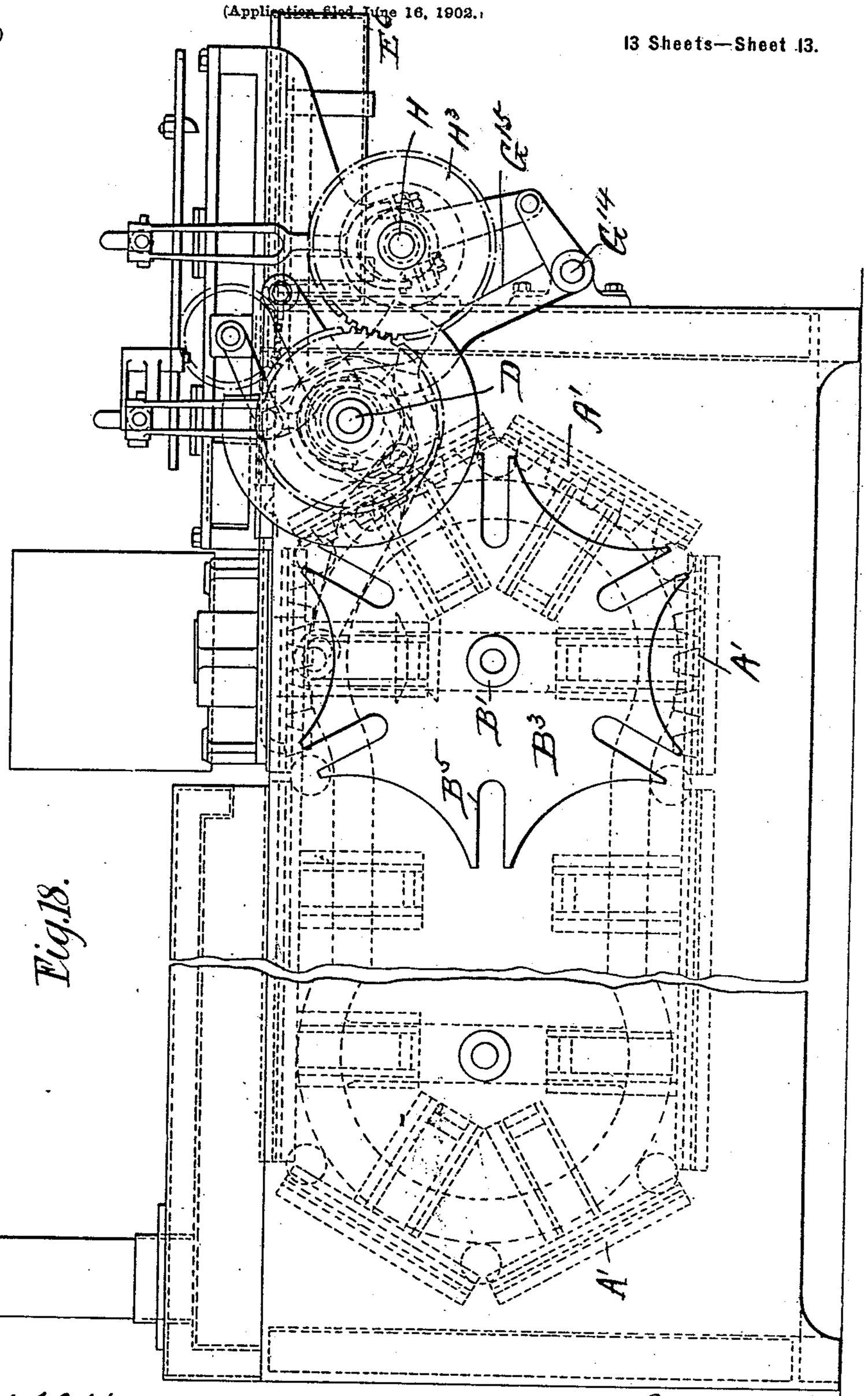

Fig. 18.

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE SAMUEL BAKER, OF LONDON, ENGLAND.

SUGAR-WAFER-BISCUIT MACHINE.

SPECIFICATION forming part of Letters Patent No. 712,473, dated November 4, 1902.

Application filed June 16, 1902. Serial No. 111,945. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SAMUEL BAKER, a subject of the King of England, residing at London, England, have invented certain new and useful Improvements in Sugar-Wafer-Biscuit Machines, of which the following is a specification.

This invention relates to the construction of automatic sugar-wafer-biscuit machines for the production of wafer-sheets, in which the batter of the wafer-sheet is baked between two heated plates, and has more particularly reference to the manufacture of wafer-sheets with indentations, cups, or other shapes such as would not readily allow the hinged plates of an ordinary sugar-wafer-biscuit machine or tongs being employed.

In constructing a machine according to my invention provision is made for the separating of the two plates forming the wafer-tongs and the raising of one from the other for the purpose of filling in the batter and also removing the baked sheet of wafers first by a movement which separates the plates at an equal distance from the four corners, the one being raised perpendicularly and parallel with the other, and, secondly, a further separation by means of a hinge, thus causing one plate to open at right or other angle to the other and giving access to the interior of the plate.

In one form of machine I construct the bottom part of the wafer-tongs upon the circumferences of a hollow wheel or drum, which is set in a suitable casing of brickwork or other non-conducting material, with provision for the heating of the plates from the interior or exterior of the drum by means of suitable gas-burners or other heating appliances. The drum is supported upon spindles and may be worked by means of gearing provided with a stopping device for arresting the wafer-tongs periodically at the point where the plates are filled and discharged. Each of the top plates is carried in a framework to which it is hinged. Each of the frames for carrying the top plates is carried by segmental flanges in annular grooves placed concentrically with the drum carrying the bottom plates. A portion of each of these annular grooves is cut out at the point where the plates are stopped for filling and discharging, and loose slides with segmental grooves corresponding with the annular grooves are made to carry the frames at this point, so that when the frame carrying the top plate comes opposite to this point the drum is arrested by the stopping device and the frame carrying the top plate is lifted away from the drum by means of cam mechanism or other device. This lifting motion causes the two plates to separate parallel from each other, thus giving the first separating motion. As the plates are further separated by the continued movement of the frame away from the drum a projection on the plate in a suitable position with regard to the hinge-joint comes in contact with a fixed stop upon the frame of the machine, causing the top plate to revolve upon its hinge to such angle with reference to the bottom plate as may be determined.

The stopping device may be constructed with an interrupted disk with a lever or cam so arranged as to work in connection with a star-wheel at such time as the interruption in the disk comes into position for the said lever or cam to operate the said star-wheel. At all other times the uninterrupted portion of the disk will engage with a corresponding portion of the star-wheel to lock same and prevent the drum turning upon its axle.

Other devices may be employed for automatically stopping the drum. The wafer-tongs instead of being set upon the surface of a drum may be extended into an endless band revolved by suitable gearing, or the plates may lie horizontally and radiate from a vertical axis.

A locking device may be arranged to hold the plates together when filled with batter. After the batter has been filled into the lower plates a cam arrangement may be brought into operation to lower the sliding segments of annular grooves to their first position, thus allowing the top plate first to close upon its hinges until such a time as it again becomes parallel with the bottom plate, and as the sliding segment comes to its first position, making the annular ring complete, the plates are brought together and the drum, together with the frames carrying the top plates, is free to move upon its axis.

This device may be arranged and applied to that machine for automatically filling the

plates with batter by means of pumps or other appliances controlled by cams or other working parts of the machine.

A convenient construction of apparatus for carrying out my invention is illustrated in the accompanying drawings, of which—

Figure 1 is a plan of the machine; Fig. 2, an elevation of one side, and Fig. 3 an elevation of one end, of the machine; Fig. 4, a vertical section on the line 4 4 of Fig. 1. Fig. 5 is a sectional elevation showing the mold-cover raising and lowering device. Figs. 6 and 7 are detached views of the drum rotating and locking mechanism in locked and rotating positions, respectively, the mold-cover raising and lowering mechanism being also shown in their relatively corresponding positions. Figs. 8 and 9 are views of the pumps and pump-piston-operating cams, illustrating their extreme positions, respectively. Figs. 10 and 11 are views of the operating mechanism of the pumps, showing positions corresponding, respectively, with the position of the pumps shown in Figs. 8 and 9. Fig. 12 is a plan view of the pumps and part of their operating mechanism. Figs. 13 and 14 are diagrammatic views illustrating the starting motions. Fig. 15 is a plan, and Figs. 16 and 17 elevations, of a modified form of machine in which the molds are arranged on one end of a drum rotating on a vertical axis; and Fig. 18 an elevation, of a form of machine in which the molds are carried on an endless band.

Like letters indicate like parts in all the drawings.

The machine is provided with six wafer trays or molds, each mold being arranged to make twenty wafers and comprising a bottom and upper plate A and A′, respectively. The bottom plates A of these trays carry the matrices for the wafers and form the circumference of a drum B, carried on hollow trunnions B′ B^2, rotatable in bearings C′, formed in the side plates C^2 of the frame of the apparatus. Fixed on the outer end of the trunnion B′ is the drum locking and rotating wheel B^3. The wheel is provided with six locking-curves B^4 and six actuating-slots B^5, alternating with the curves B^4. Secured on a rotatable shaft D, carried in bearings formed in the side plates of the frame of the machine, is a locking-disk B^6, Figs. 2, 6, and 7, the curve of whose periphery corresponds to and is arranged to engage in the curves B^4. A portion of its periphery is cut away at B^7, so that as the disk revolves that portion is free of the drum-wheel B^3. Fixed on the same shaft D and placed so as to cut the portion B^7 of the disk B^6 centrally is a short arm B^8, having a pin B^9, arranged as the shaft D revolves to engage in one of the slots B^5 of the drum-wheel B^3. The pin B^9 preferably carries a roller. If now the shaft D be revolved while the periphery of the disk B^6 corresponds with one of the curves B^4, (as shown in Fig. 6,) the wheel B^3, and consequently the drum B, is held motionless and locked, but when the cut-away portion B^7 corresponds with the wheel B^3, as shown in Fig. 7, the latter is free, and the pin B^9 being now engaged in one of the slots B^5 the wheel is rotated through one-sixth of a revolution.

To rotate the shaft D, the following device (shown most clearly in Fig. 13) may be provided. On the end of the shaft D is a loose pulley D′, connected by a belt with a source of power and kept constantly running while the machine is at work. Fixed onto the pulley is a toothed wheel D^2 and one member D^3 of a clutch. Arranged on the shaft D so as to revolve with it, but capable of movement along it, is the other clutch member D^8, arranged to be operatively engaged with the member D^3 by means of a forked lever D^4, rod D^5, and handle D^6; a spring D^7 being provided to hold the clutch members normally inoperative. Fixed on the shaft D immediately behind the clutch member D^8 is a disk D^9 with a slot D^{10} in its periphery, adapted to engage a nose D^{11} on the lever D^4 when the machine is in its stopped position, as shown in Figs. 2, 3, and 4. If now the operator pulls the handle D^6, bringing the clutch D^3 D^8 into operative position, the nose D^{11} is disengaged from the disk-slot D^{10} and the disk revolves with the shaft D. If now the handle is at once released, the nose D^{11} comes in contact with the surface of the disk, and the clutch consequently remains operative during one revolution, at the end of which the nose, under the action of the spring D^7, again engages with the slot and the machine stops. Thus each time the operator pulls the handle D^6 the drum revolves one-sixth of a revolution, removing one mold and bringing the next into the top position.

The upper plates A′ carry the mold-cores A^2 and are each mounted on a sliding frame consisting of an upper flange A^3 and side plates A^4, one on each side of the drum. Each plate A′ is fastened onto one side of its frame-flange by hinges A^5 and has one or more lugs A^6, adapted when the frame is raised to engage with a nose or noses A^7, fixed on the frame of the machine.

The side plates A^4 are carried in slides A^8, Fig. 4, formed on the sides of the drum B and are provided with curved flanges A^9, adapted to run in grooves C^3, formed in the side plates C^2 when the plate-frame is lowered. Each groove C^3 forms a complete circle in which the corresponding flange A^9 runs as the drum B revolves; but at their upper portion instead of being formed in the frame of the apparatus it is placed in a slider A^{10}, adapted to reciprocate in vertical guides in the side frame-plates C^2. The slider is reciprocated by means of a lever A^{11}, Fig. 5, pivoted on a pin A^{12} on the machine-frame. One end of the lever is provided with a slot A^{13}, in which works a pin A^{14}, carried on the slider A^{10}. The other end of the lever beyond the fulcrum-pin has a curved portion A^{15}, ending in a nose A^{26}, which engages a

cam A^{16}, fixed on the shaft D, before referred to. This cam and lever raise the slider, and the weight of the slider and parts carried by it tend to lower it when the raised portion of the cam is disengaged from the lever-nose; but to insure certainty in the closing action a second lever and cam are preferably provided, as follows: Fixed to the boss of the lever A^{11} is a short arm or lowering-lever A^{17}, with a pin A^{18}, engaged in a cam-groove A^{19}, formed in a second cam A^{20} on the shaft D.

A slider and its reciprocating mechanism are preferably provided, as shown in the drawings, for each side plate of the mold-cover frame.

As before described, the locking-disk and rotating arm for the drum are also carried on the shaft D, and the raising and lowering mechanism for the slider is so arranged relatively to the rotating and locking devices that the frame carrying the upper mold-plate commences to rise directly the drum stops and is lowered before the drum again starts. Thus each time the handle D^6 is pulled by the operator the upper mold-plate is lowered, the next mold brought into position, and its upper plate opened ready for the wafers to be removed and fresh batter placed in the molds.

In order to hold the plates A A′ of the mold closed when the drum is revolving, a circular flange C^{10}, Fig. 5, is provided on one of the side plates C^2, which corresponds with the curved end of the upper plate A′.

The following mechanism is provided in order to automatically fill the molds with batter. This mechanism is shown detached in Figs. 8, 9, 10, 11, and 12. Placed at one side of the mold is a series of pump-cylinders E, equal in number to the rows of matrices in each mold. This number is arbitrary. Conveniently twenty are used, as shown in the drawings—viz., four rows of five each. The pump-cylinders are carried side by side on a cross-bar G′, each end of which is formed integral with or bolted to a slide-block G, adapted to reciprocate horizontally in guideways G^2, placed one on each side of the machine. Each slide-block G is hollowed out to form a chamber G^3, in which is a coiled spring G^4, one end of which abuts on the bottom of the chamber, the other against one side of the end G^5 of a cross-bar G^6, the ends G^5 being also adapted to slide within the guideways G^2. The ends of the pump piston-rods E′ are fixed to this cross-bar, and carried in lugs toward each end is a small roller G^7, each held by the tension of the springs G^4 against the periphery of a cam G^8. These cams are fixed on a shaft G^9, rotatable in bearings formed by two slide-blocks G^{10}, each movably held within one of the guideways G^2. Each pair of slide-blocks G G^{10} are rigidly connected together by a spindle G^{11}, the ends G^5 of the cross-bar G^6 being bored to permit of these spindles passing through them. The pumps E are single-acting pumps of known construction, each having a valve E^2 controlling the discharge-port, which is connected to a pipe E^3 of a length sufficient for its mouth to reach over the wafer-matrix farthest from the pump when this is in its most forward position, as shown in Figs. 1 and 8, and a valve E^4 controlling the suction-port, which is connected to a pipe E^5, of which the free end dips into the batter-tank E^6, supported on the frame of the machine between the guideways G^2, but at a lower level. The pistons of the pumps are operated by the springs G^4 and cams G^8, previously referred to; but it is evident that besides operating the pump-pistons it is necessary to bring the end of each discharging-pipe E^3 successively over each of the five matrices in its corresponding row and also to draw it clear of the molds while these are being opened and shut. The following mechanism may be employed for this purpose: Fixed on one end of the rotatable shaft G^9, which carries the cams G^8, is a toothed wheel G^{12}, gearing with a toothed rack G^{13}, carried on the machine-frame outside one of the guideways G^2. Extending across one side of the machine and carried in bearings in brackets C^4 is a rocking shaft G^{14}, on each end of which is fixed one end of an arm G^{15}, the other end of which is connected by a link G^{16} to the pump-cam, carrying shaft G^9. Carried in bearings C^5 in brackets fixed on the machine-frame above the brackets C^4 is a shaft H, carrying an eccentric H′, of which the rod H^2 is pivoted to the free end of an arm G^{17}, fixed on the rocking shaft G^{14}. The shaft H extends beyond the framework of the machine on one side and has running free on that end a toothed wheel H^3, gearing with the constantly-running toothed wheel D^2, before described. The wheel H^3 carries one member H^4 of a clutch, and a similar arrangement to that already described for revolving the drum-operating shaft D is provided for the shaft H, comprising clutch member H^5, forked lever H^6 H^7, disk H^8 H^9, rod H^{10}, handle H^{11}, spring H^{12}. This arrangement is seen most clearly in Fig. 13. The mechanism operates as follows: On the operator pulling the handle H^6 the clutch members H^4 H^5 are engaged during one complete revolution of the shaft H. If now the pumps are in the position shown in Figs. 9 and 11—that is, farthest removed from the molds with the cylinders filled with batter and the delivery-pipes E^3 clear of the molds—the shaft H, revolving the eccentric H′ by means of rocking shaft G^{14}, arm G^{15}, and link G^{16}, gives a forward movement toward the molds of the pumps and their connections, the slide-blocks G G^{10} being rigidly connected together. At the same time the gear-wheel G^{12} is rotated by the rack G^{13} and the cams G^8 are revolved. These cams are so shaped and positioned, as shown in Fig. 9, that as the cam begins to revolve no movement is given to the pump-pistons, allowing the nozzles of the pipes E^3 to be brought over the first matrices of the mold without the discharge of

batter. As the cams continue to revolve they drive in the pump-pistons against the tension of the springs G^4, discharging batter into the fire-molds until the eccentric has made one-half of a revolution, when the pump-pistons are at the end of their stroke and the discharge-pipe nozzles are over the last matrices of the rows in the position shown in Figs. 1 and 8. The lever G^{15} now commences its return stroke, the pressure of the springs G^4 returns the pump-pistons, sucking up batter from the tank E^6 through the pipes E^5, and the pumps themselves are returned into the position shown in Fig. 9, with the discharge-pipes E^3 clear of the molds. If now the operator pulls the handle D^6, the upper cover of the mold which has just been filled is lowered, the drum revolved, bringing the next mold into position and its upper plate raised, as before described. The operator can then remove the baked wafers if such be present and repeat the operation.

The following mechanism (shown detached in Figs. 13 and 14) may be provided to make the opening and closing of a mold and the rotating of the drum follow automatically on the filling of the molds, so that the operator has only to pull the handle H^{11} to cause the machine to make one complete operation: Pivoted at K^2 in a bracket fixed on the frame of the machine is a bell-crank lever K', one arm of which is connected to the rod D^5, while the other is connected to a square rod K^3, carried in guides, so as to be capable of endwise movement, and with a nose having a vertical face K^4 and an inclined face K^5, Fig. 14, secured, preferably adjustably, on its outer end. Fixed on the pump cam-shaft G^9 is a short arm K, slotted to receive a pivoted catch K^6, normally held, as shown in Fig. 14, by a spring K^7, with one end abutting against the body of the arm. The other end of the catch projects beyond the arm, and the rod K^3 is so placed relatively to the catch that at the end of the backward movement of the pumps the catch K^6 engages the vertical face K^4 of the nose on the rod K^3, pushing the rod back and through the crank-lever K' the handle-rod D^5, thus setting the drum and mold-operating mechanism in action. On the return movement of the pumps the catch K^6 engages the inclined face K^5 of the rod-nose, and the spring K^7 yielding passes under the nose without any action on the rod. The operator therefore by pulling the handle H^{11} causes the machine to perform one complete cycle of operations—viz., fill the matrices with batter, close the mold, rotate the drum, bring the next mold into position, and raise its upper plate. If, however—say when stopping work—he wishes to empty the molds without refilling them, he pulls the handle D^6, when the drum revolves, presenting another mold; but the pumps remain inoperative.

The molds are heated, preferably, by gas—say by burners, as shown in Fig. 4. One, P', is placed within the drum, its supply-pipe being carried through the hollow trunnion B^2, the other, P^2, being beneath the drum, its connections being arranged as most convenient. Ventilation-holes (not shown) are provided in the sides of the drum, and a chimney may be arranged on the casing to carry off the products of combustion.

While in the machine hereinbefore illustrated and described the frame carrying the upper mold-plate is shown with two side plates, it is evident that the one side plate to which the upper mold-plate is not hinged may be dispensed with, in which case only one set of operative mechanism for the frame would be used.

Figs. 15, 16, and 17 illustrate a modified form of apparatus, in which the drum carrying the molds is arranged on a vertical axis. The arrangement of the various mechanism follows closely that already described and does not require a detailed description. The drum instead of being driven direct by the wheel B^3 is provided with intermediate bevel-gear M M', as shown in Fig. 16.

Fig. 18 illustrates a further modification, in which the molds are mounted in an endless band instead of on a drum.

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

1. In a wafer-biscuit machine, a mold comprising an upper plate and a lower stationary plate, in combination with a rectilineally-movable support to which the upper plate is hinged, means for moving the support rectilineally and with it the upper plate to cause the latter to separate from the lower plate and means for swinging the upper plate on its hinge after it has been raised, as and for the purpose specified.

2. In a wafer-biscuit machine, a mold comprising an upper plate and a lower stationary plate, in combination with a slidable supporting-frame to which the upper plate is hinged, guides for said frame, means for sliding the support and with it the upper plate in a direction to cause the upper plate to separate from the lower plate, and means for swinging the upper plate on its hinge after it has been raised, as and for the purpose specified.

3. In a wafer-biscuit machine the combination with a series of molds each comprising an upper and a lower plate, and a support on which the upper plate is hinged of means to remove a mold from, and bring the next mold of the series into, the filling position, means to raise the support thus opening the mold, means to hold the mold open and means to reclose the mold.

4. In a wafer-biscuit machine the combination with a series of molds each comprising an upper and a lower plate, and a support on which the upper plate is hinged of means to remove a mold from, and bring the next mold of the series into, the filling position, means

to raise the support thus opening the mold, means to hold the mold open, means to fill the matrices of the mold with batter while thus open and means to reclose the mold.

5. In a wafer-biscuit machine comprising a series of molds and means to bring each mold successively into and remove it from the filling position the combination with a starting device for the mold-position-changing means, of a device to stop the action of the latter when one mold has been removed from, and another mold brought into the filling position.

6. In a wafer-biscuit machine comprising a series of molds and means to fill the mold-matrices with batter when a mold is in the filling position, the combination with a starting device for the mold-filling means, of a device to stop the action of the latter when the matrices of one mold have been filled.

7. In a wafer-biscuit machine having a series of molds, means to bring each mold of the series successively into, and remove it from, the filling position and means to open and close each mold when in the filling position the combination with means for filling the mold-matrices with batter and a starting device for the same, of a device controlled by the batter-filling means for starting the mold opening and closing means and the mold-position-changing means.

8. In a wafer-biscuit machine having a series of molds, means to bring each mold of the series successively into, and remove it from, the filling position and means to open and close each mold when in the filling position the combination with means for filling the mold-matrices with batter and a starting device for the same, of a device controlled by the batter-filling means for starting the mold opening and closing means and the mold-position-changing means, a device for stopping the batter-filling means when the matrices of one mold have been filled and a device for stopping the mold closing and opening means and the mold-position-changing means when one mold has been closed and removed from, and the next mold brought into, the filling position and opened.

9. In a wafer-biscuit machine and in combination a casing with an opening in its upper part, a drum revolubly mounted in the casing; a series of molds carried on the drum, each mold comprising a lower plate fixed on the drum, a frame carried in slides on the drum and having a flange adapted to engage a groove in the casing, and an upper plate hinged on said frame; a slider capable of reciprocation vertically in the casing-opening having a pin and a groove adapted to engage the flange of a mold-frame when brought beneath the casing-opening; a cam carried on a revoluble shaft engaging the nose of one end of a pivoted lever, of which the other end has a slot within which the slider-pin is engaged; and means to revolve the cam and so raise the slider and with it the mold-frame substantially as specified.

10. In a wafer-biscuit machine and in combination a casing with an opening in its upper part; a drum revolubly mounted in the casing; a series of molds carried on the drum, each mold comprising a lower plate fixed on the drum, a frame carried in slides on the drum and having a flange adapted to engage a groove in the casing, and an upper plate hinged on said support; a slider capable of reciprocation vertically in the casing-opening; a cam carried on a revoluble shaft engaging the nose of one end of a pivoted lever of which the other end has a slot within which the slider-pin is engaged; a short arm fixed to the lever having a pin engaged in a slot in a second cam carried on the said revoluble shaft and means to revolve the shaft and thus reciprocate the slider substantially as specified.

11. In a wafer-biscuit machine and in combination a casing with an opening in its upper part; a drum revolubly carried in bearings in the casing and having a series of molds arranged on its periphery, a wheel revoluble with the drum and having a series of alternating curves and slots in its circumference; a rotatable shaft; a locking-disk fixed thereon, the circumference of which is adapted to engage the curves of the said wheel but having a portion of said circumference cut away; an arm likewise carried on said shaft, with a pin in its free end adapted to engage with one of the wheel-slots during that portion of each revolution of the shaft when the cut-away portion of the locking-disk corresponds to a wheel-curve; and means to rotate the shaft substantially as specified.

12. In a wafer-biscuit machine and in combination a casing with an opening in its upper part; a drum revolubly carried in bearings in the casing and having a series of molds arranged on its periphery; a wheel revoluble with the drum and having a series of alternating curves and slots in its circumference; a rotatable shaft; a locking-disk fixed thereon, the circumference of which is adapted to engage the curves of the said wheel but having a portion of said circumference cut away; an arm likewise carried on said shaft, with a pin in its free end adapted to engage with one of the wheel-slots during that portion of each revolution of the shaft when the cut-away portion of the locking-disk corresponds to a wheel-curve; a loose pulley carried on said shaft adapted to be revolved by a convenient source of power and carrying one member of a clutch; a second clutch member carried on said shaft so as to be rotatable with it but capable of lengthwise movement thereon; a handle and rod carried on the casing, controlling one arm of a pivoted lever the other arm of which engages the second member of the clutch; a nose on said lever adapted to engage a slot in a disk fixed on the said shaft when the two clutch members are disengaged, and a spring carried on the rod operating to normally hold the clutch members disengaged substantially as specified.

13. In a wafer-biscuit machine and in combination a casing having an upper opening; a series of molds, each mold comprising a lower plate having a row of matrices and means to bring these plates successively into position in the casing-opening; a batter-tank carried in the casing; a single-acting pump having a pipe connected to its suction-port the free end of said pipe dipping in the batter-tank; a second pipe connected with the pump delivery-port; the pump and its delivery-pipe being normally held in the casing free from the mold-plate; and means to reciprocate the pump so as to cause the free end of the delivery-pipe to pass over the mold-matrices, and means to give one complete reciprocation to the pump-piston during each complete reciprocation of the pump substantially as specified.

14. In a wafer-biscuit machine and in combination a casing having an upper opening; a series of molds each comprising a lower plate having a plurality of matrices, and means to bring each plate successively into the casing-opening; a batter-tank carried in the casing; two horizontal guides carried on the casing, a slide-block in each guide carrying a cross-bar; a plurality of pump-cylinders carried on the cross-bar; a pipe leading from each pump suction-port to the batter-tank and a pipe connected to each pump delivery-port; a second cross-bar, to which the pump piston-rods are attached, with sliding bearings in the said guides; coiled springs tending to hold the two cross-bars separate, a guide-block in each horizontal guide rigidly connected by a spindle to each end of the first cross-bar, and forming bearings for a revoluble shaft; a cam carried on said shaft adapted to engage a roller carried on the second cross-bar so as to cause the two cross-bars to approach against the pressure of the springs and thus make a forward stroke of the pump-piston; a toothed wheel fixed on one end of the said shaft engaging a horizontal rack carried on the casing, and means to reciprocate the guide-blocks in their guides substantially as specified.

15. In a wafer-biscuit machine and in combination a casing having an upper opening; a series of molds each comprising a lower plate having a plurality of matrices, and means to bring each plate successively into the casing-opening; a batter-tank carried in the casing; two horizontal guides carried on the casing; a slide-block in each guide, carrying a cross-bar; a plurality of pump-cylinders carried on the cross-bar; a pipe leading from each pump suction-port to the batter-tank and a pipe connected to each pump delivery-port; a second cross-bar, to which the pump-pistons are attached, with sliding bearings in the said guides; coiled springs tending to hold the two cross-bars separate; a guide-block in each horizontal guide rigidly connected by a spindle to each end of the first cross-bar, and forming bearings for a revoluble shaft; a cam carried on said shaft adapted to engage a roller carried on the second cross-bar so as to cause the two cross-bars to approach against the pressure of the springs, and thus make a forward stroke of the pump-pistons; a toothed wheel fixed on one end of the said shaft engaging a horizontal rack carried on the casing; a revoluble shaft carried in bearings in the casing; an eccentric carried thereon; a bell-crank lever pivotally carried on the casing, the short arm of which is connected to the eccentric-rod and its long arm connected by a link to the cam-carrying revoluble shaft; and means to revolve the eccentric-carrying shaft substantially as specified.

16. In a wafer-biscuit machine having mold-position-shifting and mold opening and closing mechanisms, a clutch mechanism for connecting the same with a source of power controlled by a rod such as D^5, and pump-reciprocating mechanism, the combination with the clutch-controlling rod of an automatic starting device for the mold-position-shifting and mold opening and closing mechanism comprising a bell-crank lever such as K′, rod K^3, with a nose K^4, K^5, and a catch K, K^6, K^7, carried on the pump-reciprocating mechanism substantially as specified.

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

GEORGE SAMUEL BAKER.

Witnesses:

WALTER J. SKERTEN,

T. I. OSMAN.