

(No Model.)

4 Sheets—Sheet 1.

L. EBERHART & I. D. STEVENS.
BROADCAST SEED SOWER.

No. 402,150.

Patented Apr. 30, 1889.

Fig. 1.

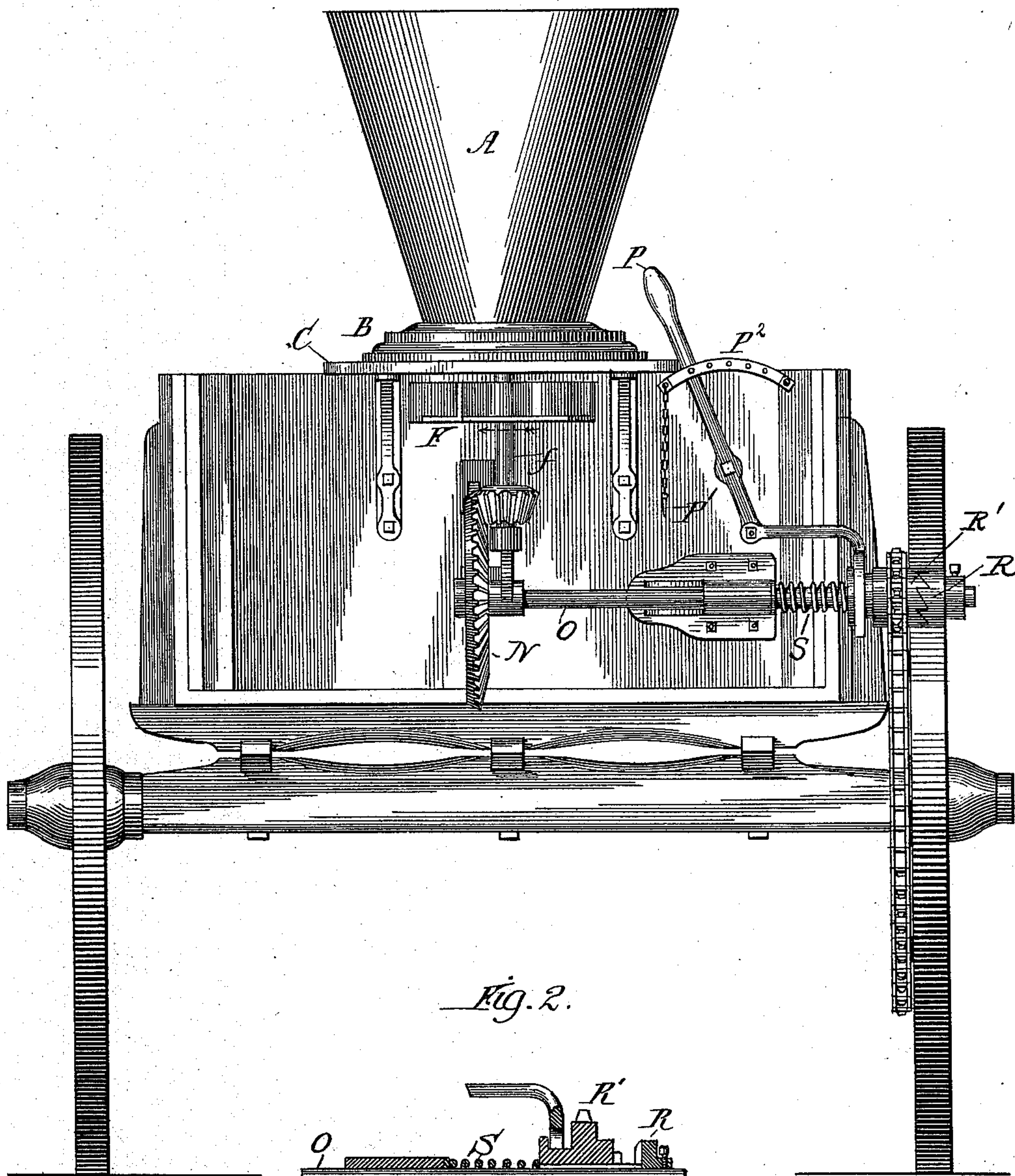


Fig. 2.

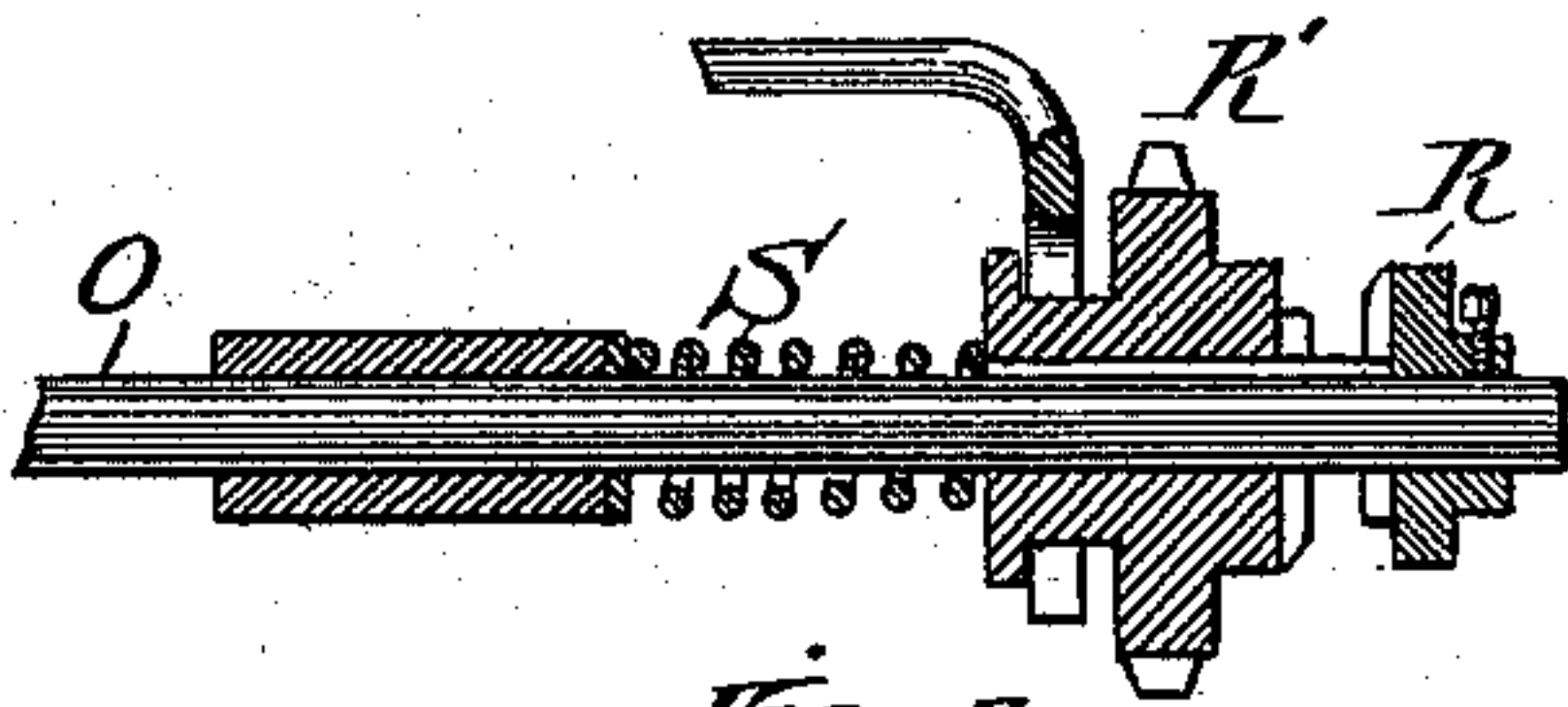
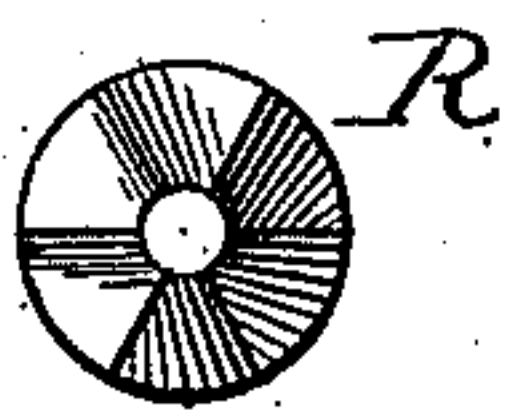


Fig. 3.



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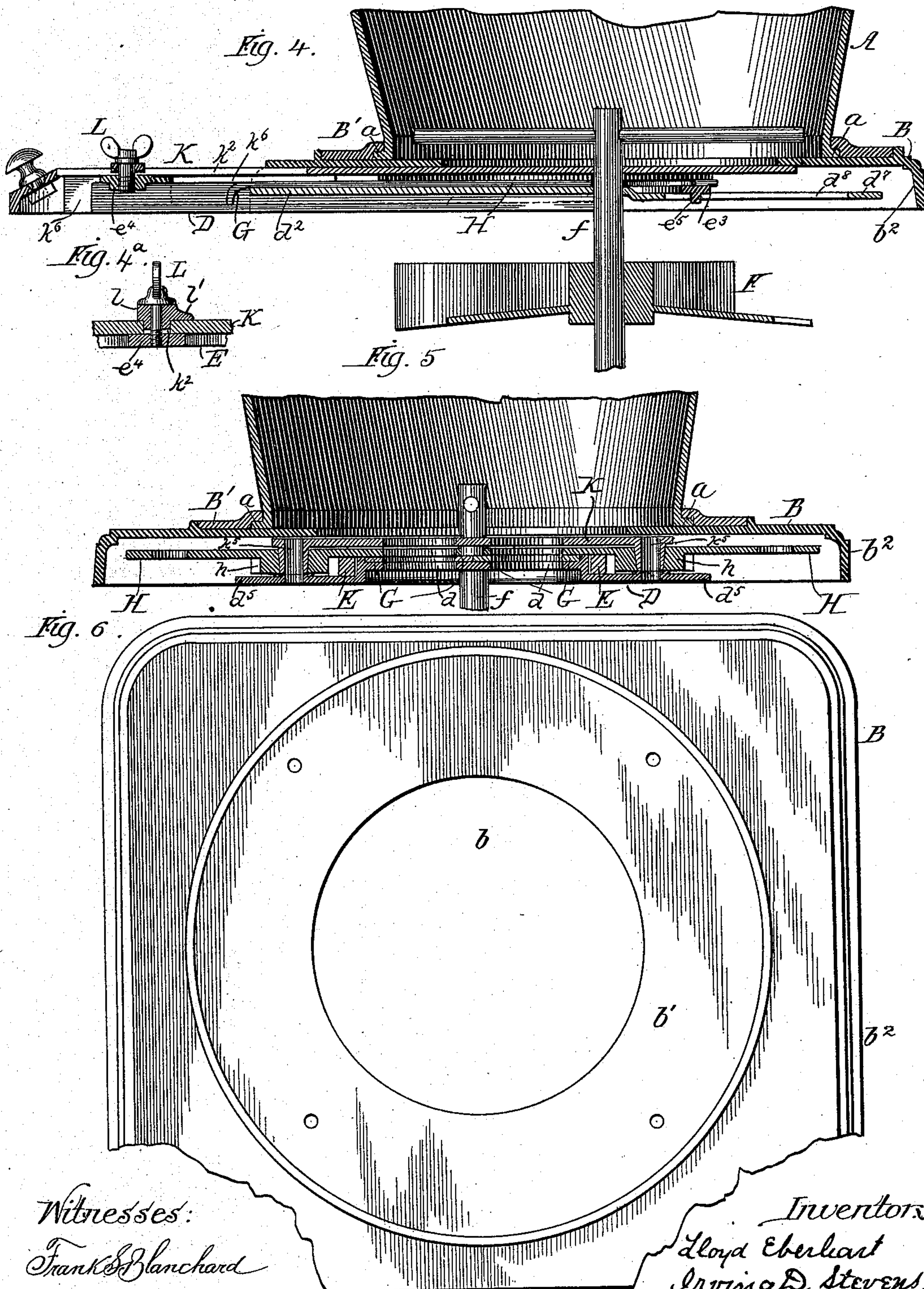
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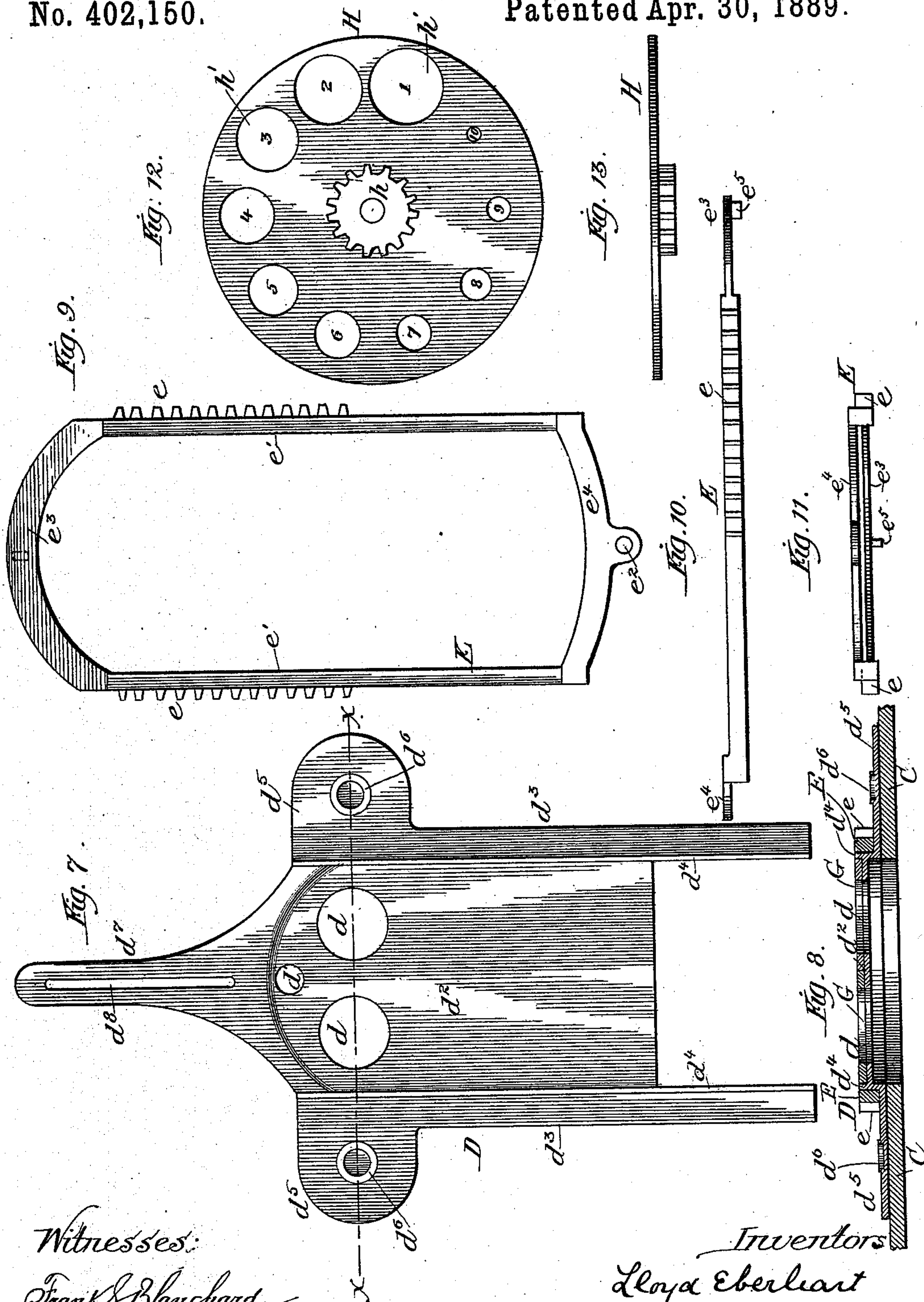
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Fig. 14.

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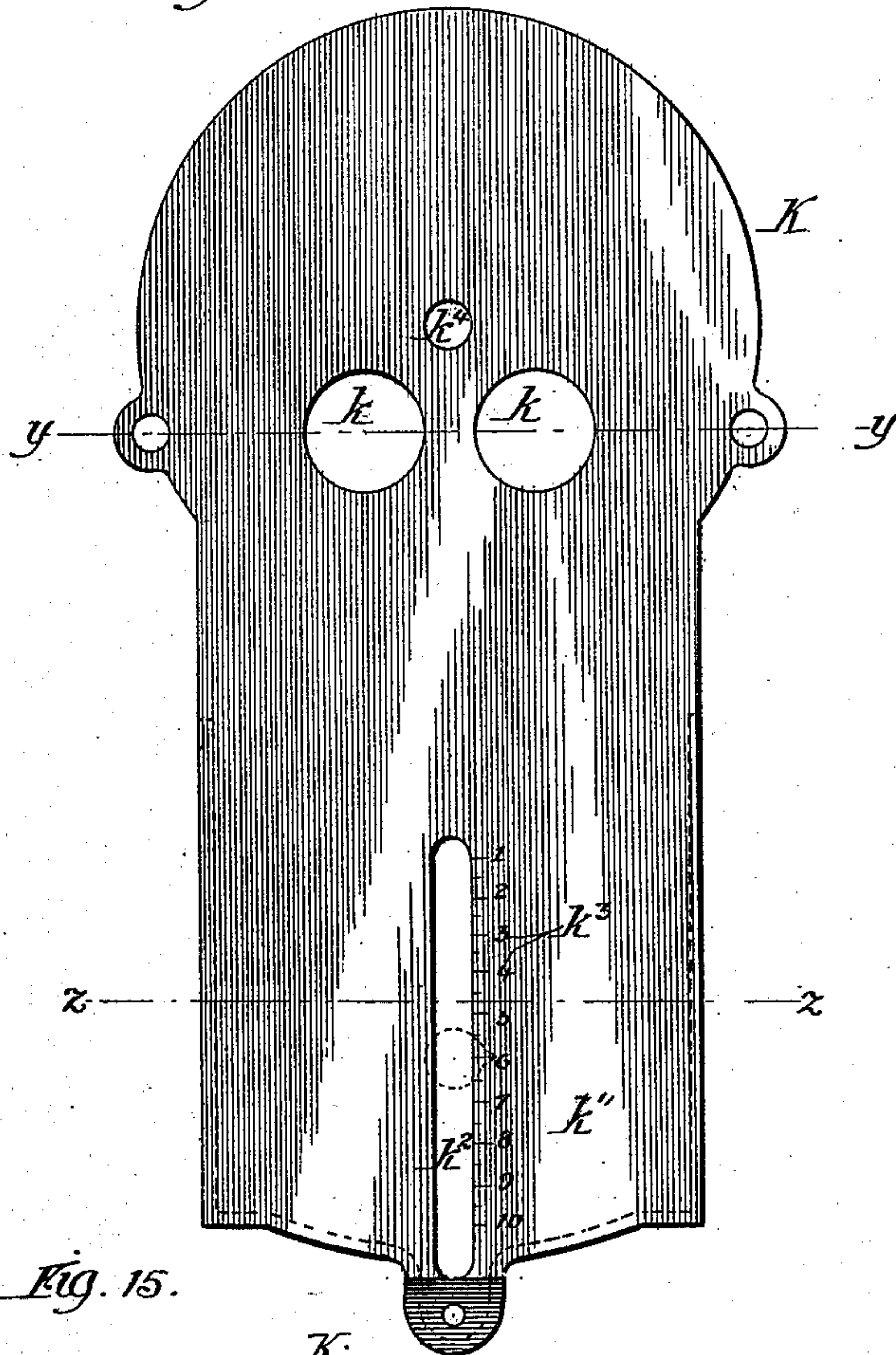


Fig. 15.

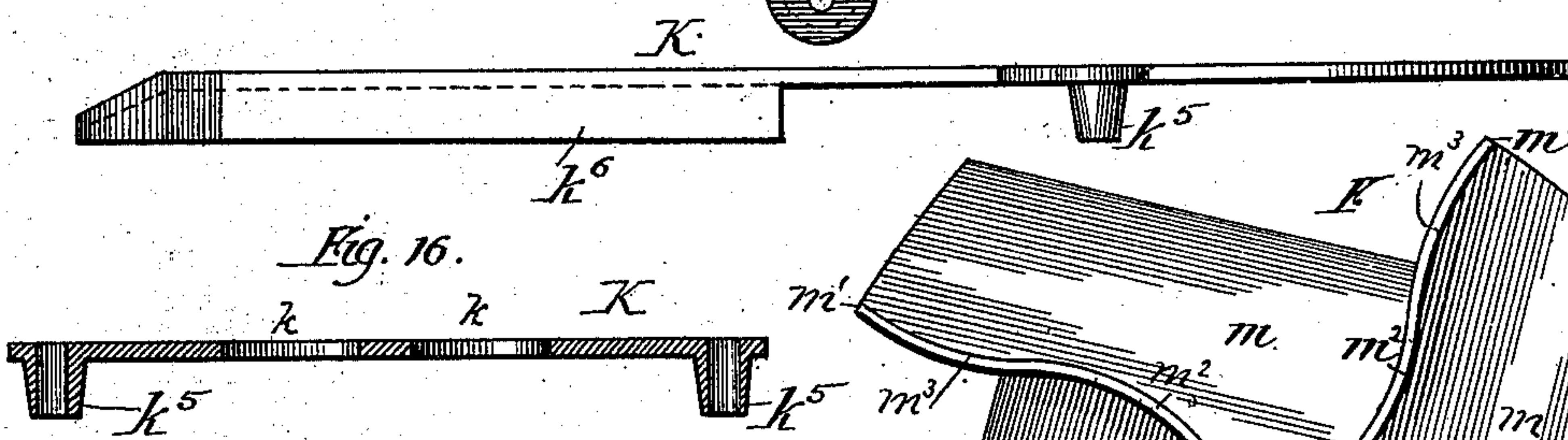


Fig. 16.

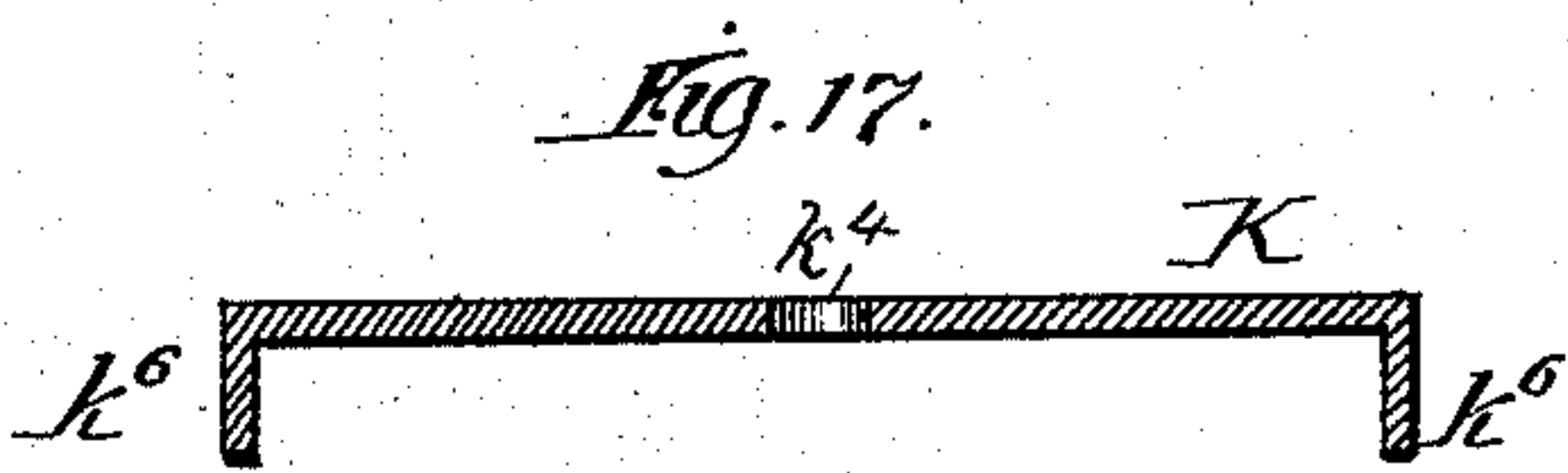


Fig. 17.

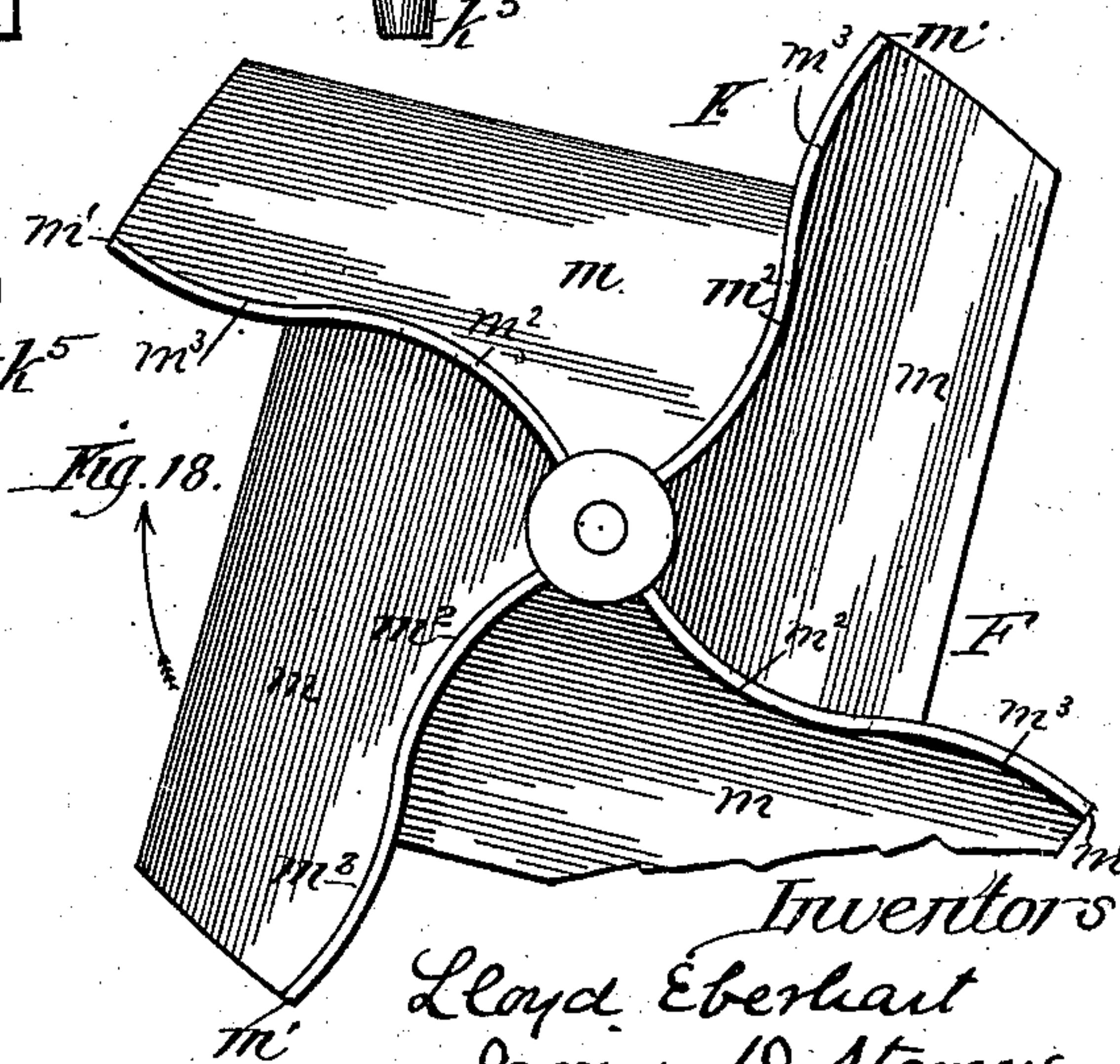


Fig. 18.

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UNITED STATES PATENT OFFICE.

LLOYD EBERHART AND IRVING D. STEVENS, OF JOLIET, ILLINOIS.

BROADCAST SEED-SOWER.

SPECIFICATION forming part of Letters Patent No. 402,150, dated April 30, 1889.

Application filed October 24, 1887. Serial No. 253,213. (No model.)

To all whom it may concern:

Be it known that we, LLOYD EBERHART and IRVING D. STEVENS, citizens of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Broadcast Seed-Sowers, of which the following is a specification.

This invention relates more particularly to the improvement of broadcast seeding-machines of that kind wherein the rotary distributor is arranged below a hopper at the rear end of a wagon and the hopper supported over a platform, that is in turn supported from the end-gate.

The principal objects of our invention are, first, to provide improved means for regulating the quantity of the discharge from the hopper, whereby the quantity of the discharge can be determined and controlled with ease and certainty; second, to improve the construction of the rotary distributor, whereby the cast therefrom shall be made more uniform and distributed more evenly upon the ground than heretofore, and finally, to provide certain novel and improved details of construction, serving to increase the utility and general efficiency of the apparatus.

To the attainment of said ends our invention consists in matters hereinafter described, and particularly pointed out in the claims.

In the drawings illustrating the devices embodying our invention, Figure 1 represents in elevation the rear end of a wagon with our improved seeding apparatus applied. Fig. 2 is a sectional detail taken through the clutch portion of the apparatus. Fig. 3 is a face view of one of the clutch-sections. Fig. 4 represents, on a somewhat larger scale, a section taken on a vertical plane centrally through the lower portion of the hopper, the hopper-base, and the seed-regulating devices. Said view also includes a section through the rotary distributor, and is taken on a line which, when the apparatus is in place at the rear end of a wagon, will be coincident with the length of the latter. Fig. 4^a is a sectional detail showing the thumb-screw L of the preceding figure provided with a pointer, L'. Fig. 5 is a sectional view similar to, but on a plane at right angles to, the plane on which the pre-

ceding section is taken. In said Fig. 5, however, the rotary distributor is omitted. Fig. 6 is a top plan view of the base-plate, with a portion thereof broken away for convenience of illustration. Fig. 7 is a top plan view of a plate that is designed to rest upon a platform secured to the end-gate of the wagon. Fig. 8 represents a section taken through plate D of Fig. 7 on the line *x x*, said section being also taken through the double rack E and the cut-off slides G, all applied to the said plate D. Fig. 9 is a top plan view of the sliding double rack. Fig. 10 is a longitudinal edge view of said double rack. Fig. 11 is a front end edge view of said double rack. Fig. 12 is a bottom plan view of one of the rotary valve-plates. Fig. 13 is an edge view of one of said valve-plates. Fig. 14 is a top plan of the hopper-bottom and serves to illustrate its slotted forward extension, provided with a scale. Fig. 15 is a longitudinal edge view of said hopper-bottom. Fig. 16 is a cross-section on line *y y*, Fig. 14. Fig. 17 is a cross-section on line *z z*, Fig. 14. Fig. 18 is a top plan of the rotary distributor.

A indicates the hopper; B, the base-plate upon which the hopper is seated and secured, and C the platform that is supported upon and from the end-gate of the wagon and utilized as a support for the said base-plate B.

The base-plate B (see more particularly Figs. 4, 5, and 6) is marginally flanged and arranged with its flange *b*² resting on the platform, so as to raise the main body of the plate above the platform and thereby provide ample working-space for the seed-regulating devices.

The base-plate B is provided with a central opening, *b*, coinciding with the lowest sectional area of the hopper, and around said opening it is provided with an annular seat, *b'*, for a ring-plate, B', which, when seated and secured in place, clamps upon the flanged or outwardly-turned lower-edge portion, *a*, of the hopper, as in Figs. 4 and 5.

Upon the platform C is placed a plate, D, (best shown in Figs. 7 and 8,) and more particularly provided as a guide and support for the double rack E, that is best illustrated in Figs. 9, 10, and 11.

The plate D is perforated with two seed ap-

ertures or passages, d , and it is further provided with a perforation, d' , for the spindle f of the rotary distributor F.

The cut-off slides G, for opening or closing either or both of the two seed-discharging passages, are arranged between the plate D and the hopper, to which end the middle portion, d^2 , of said plate is raised somewhat above its side portions, d^3 , and provided along its longitudinal edges with ribs d^4 , in order to provide between such ribs a space for the cut-off slides which rest and slide on the middle portion, d^2 , of plate D.

The double-rack slide E for operating the rotary valve-plates H (one of which is shown in Figs. 12 and 13) consists, substantially, of a rectangular frame provided with two lines of rack-teeth, e and e' , respectively formed along its opposite longitudinal side edges. When applied upon the plate D, the side bars, e' , of this rack-frame rest upon and can slide along the side portions or horizontal side flanges, d^3 , of the said plate, in which case the ribs or walls d^4 , formed along the junction of the middle and side portions of the plate D, serve as guides for the rack-frame, as will be understood by reference to Figs. 5 and 8, wherein the rack-frame is shown in cross-section.

The hopper has its bottom suitably apertured so as to discharge at two separate points, and below the hopper-bottom are arranged the two rotary adjustable valve-plates H, each of which is provided with a graduated series of openings, h' , arranged in a circular line about its pivotal center. These rotary valve-plates are separately pivoted at such distance apart as shall serve to bring the circular line of openings of one valve-plate under one of the discharge-apertures of the hopper-bottom and likewise bring the openings of the oppositely-arranged valve-plate under the remaining one of the hopper-bottom apertures. This arrangement will be readily distinguished from the double-valve arrangement of our Patent No. 340,563, wherein two double-apertured valve-plates are arranged and operated so as to contract and expand the hopper-bottom apertures toward and from their centers.

The rotary valve-plates H are arranged upon the side portion of the plate D, which latter has its side portions extended laterally at opposite sides of its pair of apertures d , so as to provide appropriate bearing portions d^5 for the toothed hubs or pinions h of said valves to rest upon. To lessen friction between the toothed hubs or pinions of the valves and the supporting-plate, the latter has its aforesaid lateral extensions d^5 provided with slightly-raised bosses d^6 , Figs. 7 and 8, which said bosses serve as the bearing portions on which the pinions are directly supported. When the perforated valve-plates H are thus placed upon the plate D, their toothed hubs or pinions will be engaged by the racks e of the

double-rack frame E, (see Fig. 5,) so that by drawing forward or pushing back the sliding double-rack frame the valves can be rotated either way, according to the direction in which the double-rack frame is moved. The line of apertures of one valve will, under the foregoing arrangement, be over one of the apertures d of plate D, and the line of apertures of the other valve will be over the remaining one of said apertures d . In this way, by adjusting the double-rack frame to the required extent either forward or backward, as may be found necessary, different sizes of discharge-openings h' of the rotary valve can be brought over the discharge-apertures d of the bottom plate, D, and thereby the quantity of the discharge regulated.

In order to adjust the apparatus so as to effect any particular and predetermined quantity of discharge, means are provided whereby the coincidence of any one of the apertures of each of the rotary valves with the apertures d of the plate D may be known. To such end the hopper-bottom K, Fig. 14, which is provided with two apertures, k , and arranged over the bottom plate, D, rack-frame E, and the two valves, is formed with an extension, k' , that projects to some extent forward and from under the base-plate B. This extension is provided with a longitudinal slot, k^2 , through which the stem of a set or thumb screw, L, is arranged to pass in order to engage the double-rack frame—at the point e^2 , for example, at which said point the double-rack frame is in Fig. 9 shown provided with a socket or hole for the reception of the said thumb-screw stem. The set or thumb screw serves as a handle that can be taken hold of for the purpose of sliding back and forth the double-rack frame; and it further serves as a means for securing the double-rack frame in its adjustment, since after the double-rack frame has been moved to an extent sufficient to turn the valves and bring the desired size of valve-apertures over the apertures d of the bottom plate, D, the thumb-nut or the thumb-screw can be tightened down upon the hopper-bottom extension.

A scale, k^3 , is arranged alongside the slot in the hopper-bottom extension, and desirably arranged to comprise a series of as many serial numbers as there are apertures in either one of the rotary valves H. This scale may also include fractional parts, as indicated. The relation between the numbers of the scale and the apertures of the rotary valves is such that when the thumb-screw is brought opposite any particular number the size of the discharge-passages over the bottom plate will be known. For example, in Fig. 12 we have indicated the largest valve-aperture as 1 and the smallest as 10; hence when the set or thumb screw is opposite 1 of the scale on the hopper-bottom extension the largest apertures, 1, of the valves will be over the apertures of the plate D, and when the thumb-

screw is opposite 10 of the scale the smallest apertures, 10, of the valves will be over said apertures of the bottom plate.

The thumb or set screw can be provided with any suitable pointer for more distinctly designating any particular number or fraction thereof on the scale. This pointer could consist of a washer, l , having a finger or spur, l' , at one side and placed on the thumb-screw, as in Fig. 4^a, or any other device serving a like purpose could be employed.

The hopper-bottom is provided with an opening, k^4 , for the passage of the rotary distributor-spindle, and at opposite sides said hopper-bottom is provided with two pendent journals, k^5 , which set down into the toothed hubs that form pinions rigid with the rotary valves H, in order to provide axles about which said valves may turn.

The hopper-bottom extension is flanged along opposite sides, as at k^6 , Figs. 4 and 15, so as to cover up the forwardly-extending portion of both the bottom plate, D, and the forward end portion of the double-rack plate, said side flanges being preferably formed to commence at or near the point where the hopper-bottom extension passes out from under the base-plate B.

It will be observed that the base-plate B has a pendent marginal flange, b^2 , that rests upon the platform, but that said flange is omitted at the front side of the apparatus—that is to say, at the side nearest the forward portion of the wagon—so as to permit the hopper-bottom to extend forward from under the said base-plate.

As illustrated in Figs. 4 and 7, the apertured bottom plate, D, has a longitudinally-slotted tail-piece or rear extension, d^7 . This extension serves as a support for the rear end cross-piece, e^3 , of the double-rack frame when the latter is pushed back, while its slot d^8 receives a pin or stud, e^5 , on the rear end cross-piece of the double-rack frame, Fig. 4, and thereby assists in guiding the latter and causing it when reciprocated to move endwise steadily and in a right line.

As herein shown, the double-rack frame is conveniently formed with its front-end cross-piece, e^4 , somewhat higher than its sides e' , so that while its front-end cross-piece can ride over the vertical rib portions d^4 of the bottom plate the side pieces, e' , of the rack-frame will drop down and rest upon the flat side portions, d^3 , of the bottom plate.

The cut-off slides will be suitably apertured and arranged to work substantially as in our said patent, to which end the cut-off slides may be placed between the platform C and the under side of the middle portion, d^2 , of the bottom plate, D, or upon such middle portion, d^2 , of said bottom plate, D, as herein shown, it being understood that the platform C will be apertured below the seed-passage, as heretofore.

The rotary distributor M (see particularly Fig. 18) is constructed, as usual, with a series

of inclined bottom plates or portions, m , having a series of proximately radially-arranged vertical wings or flanges, m' , along what may be termed the "back edges" of such bottom plates—that is to say, along their edges, which are in the rear relative to the forward rotation of the distributor. The features of this part of the apparatus consist in the peculiar conformation of the wings or upturned flanges. Each wing or flange is reversely curved, the first curve, m^2 , that is nearest the center of the rotary distributor, being formed to bow or in a direction forward with relation to the forward rotation of the rotary distributor, as indicated by the arrow, while the second outer curved portion, m^3 , of the wing that is formed to produce the curve bows back reversely to the inner curved portion, the curve in each instance being in the direction of the length of the rib, flange, or wing m , in contradistinction to a curve transverse to such length.

We have demonstrated by this construction that seed dropping upon one of the portions m of the distributor will, after being thrown out past the first curved portion, m^2 , of a flange or wing, be caught by the outer curved portion, m^3 , of the wing, and in place of being allowed to slide off and drop back relative to the rapid rotation of the distributor the seed will be thrown outward and forward with great force. If, for instance, the entire wing was formed on the curve m^2 the wing could not catch and throw out the seed with so much force as in the present construction, and, likewise, if the wings were straight the seed would still slide off from the distributor more easily than with the present form of curve.

The construction of clutch device for the seeding apparatus is illustrated in Figs. 1, 2, and 3. As shown in Fig. 1, the spindle of the rotary distributor is provided with a small bevel-gear engaged by a larger bevel-gear, N, which latter is fixed on the horizontally-arranged rotary shaft O. This shaft is driven from a sprocket on one of the hind wheels by the usual link belt and carries a clutch device constructed as follows: The clutch-section R is fixed upon the shaft O, while the clutch-section R' is loose, so as to both turn and slide thereon. Clutch-section R' is provided with sprocket-teeth for the link belt and is backed by a spring, S, that serves to throw it forward and normally hold its toothed end in clutch with the toothed end or face of the fixed clutch-section R. When the wagon is drawn forward, the clutch-sections remain in clutch, and the shaft is therefore revolved. When, however, the wagon is backed, the sliding clutch-section R' will be readily and automatically pushed back by the opposition of the teeth of the fixed clutch-section R, whereby the teeth of the loose clutch-section will slide over the teeth of the fixed clutch-section without turning the latter. A clutch-lever, P, is, however, shown, since it can be

used to throw back the sliding clutch-section when desired, and when so thrown back the lever can be locked by any suitable device—for example, by a pin, P' , suspended from the end of a chain and adapted to be introduced through some one of the perforations in the keeper P^2 .

What we claim as our invention is—

1. The combination, substantially as hereinbefore set forth, with the hopper having its bottom apertured to discharge at separate points, of the two rotary adjustable valve-plates each provided with a graduated series of openings and arranged to bring its openings into register with one of the discharge-apertures of the hopper-bottom, whereby the discharge from the hopper at separate points may be governed by valve-apertures of different areas, for the purpose described.

2. The combination, substantially as hereinbefore set forth, with the hopper having an apertured bottom, of a rotary valve-plate, H , provided with a toothed hub or pinion and having a graduated series of openings for the purpose set forth, and a sliding rack engaging said toothed hub or pinion of the rotary valve-plate as a means for operating the same.

3. The rotary valve-plates each provided with a toothed hub or pinion and an annular line of graduated apertures, combined with the sliding double rack engaging the pinions of the rotary valve-plates, whereby the said valve-plates may be rotated either way by operating the double rack, substantially as described.

4. The apertured hopper-bottom provided with a slotted extension, in combination with the apertured rotary valve-plates each having a toothed hub or pinion, and the sliding double rack engaging the toothed hubs or pinions of the rotary valve-plates and having a handle extending up through the slot of the hopper-bottom extension, whereby the rack can be operated and the position of the apertures of the said valve-plates determined, substantially as described.

5. The combination, substantially as hereinbefore set forth, with the rotary adjustable apertured valve-plates, each provided with a toothed hub or pinion, of the sliding double rack engaging the pinions of said valve-plates,

and an apertured bottom plate arranged below the rotary adjustable valve-plates and adapted as a guide for the sliding double rack.

6. The combination, substantially as hereinbefore set forth, with the rotary adjustable apertured valve-plates H , arranged below the apertured hopper-bottom, of a plate arranged below the rotary adjustable valves and provided with ribs d^4 and the cut-off slides G , supported to slide upon said plate between its said ribs.

7. The combination, substantially as hereinbefore set forth, with the rotary adjustable apertured valves H , each provided with a toothed hub or pinion, of the double rack engaging said pinions, a plate arranged below said valves and provided with an end extension, d^7 , having a slot in which a stud carried by the double rack is received, for the purpose described.

8. The combination, with the hopper and the rotary distributor, of the double-apertured bottom plate, D , having substantially the distinctive features of construction herein set forth, the double-rack frame E , fitted to slide on said bottom plate, the valve-plates H , each provided with a toothed hub, the hopper-bottom K , apertured and slotted, substantially as set forth, and the base-plate B , supporting the hopper and placed over the foregoing stated members.

9. In a broadcast seed-sower, the rotary distributor provided with a series of upturned wings or flanges having their outer end portions formed on the curves m^3 , whereof the curvature is arranged in the direction of the length of the wing and substantially as set forth with relation to the direction of rotation of the distributor, for the purpose described.

10. In a broadcast seed-sower, the rotary distributor provided with a series of upturned wings or flanges, m' , which are reversely curved in the direction of their length, substantially as and for the purpose described.

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