

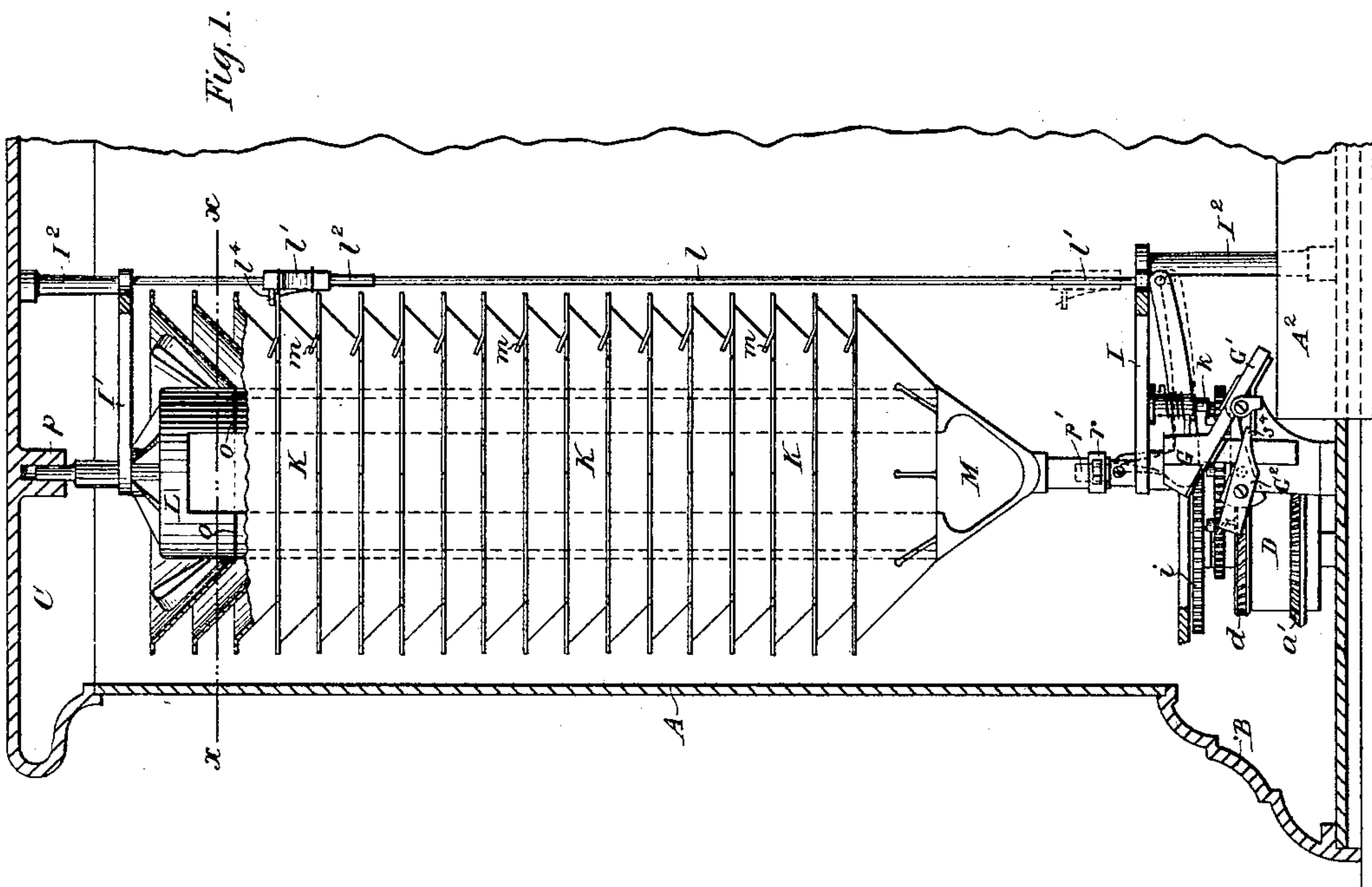
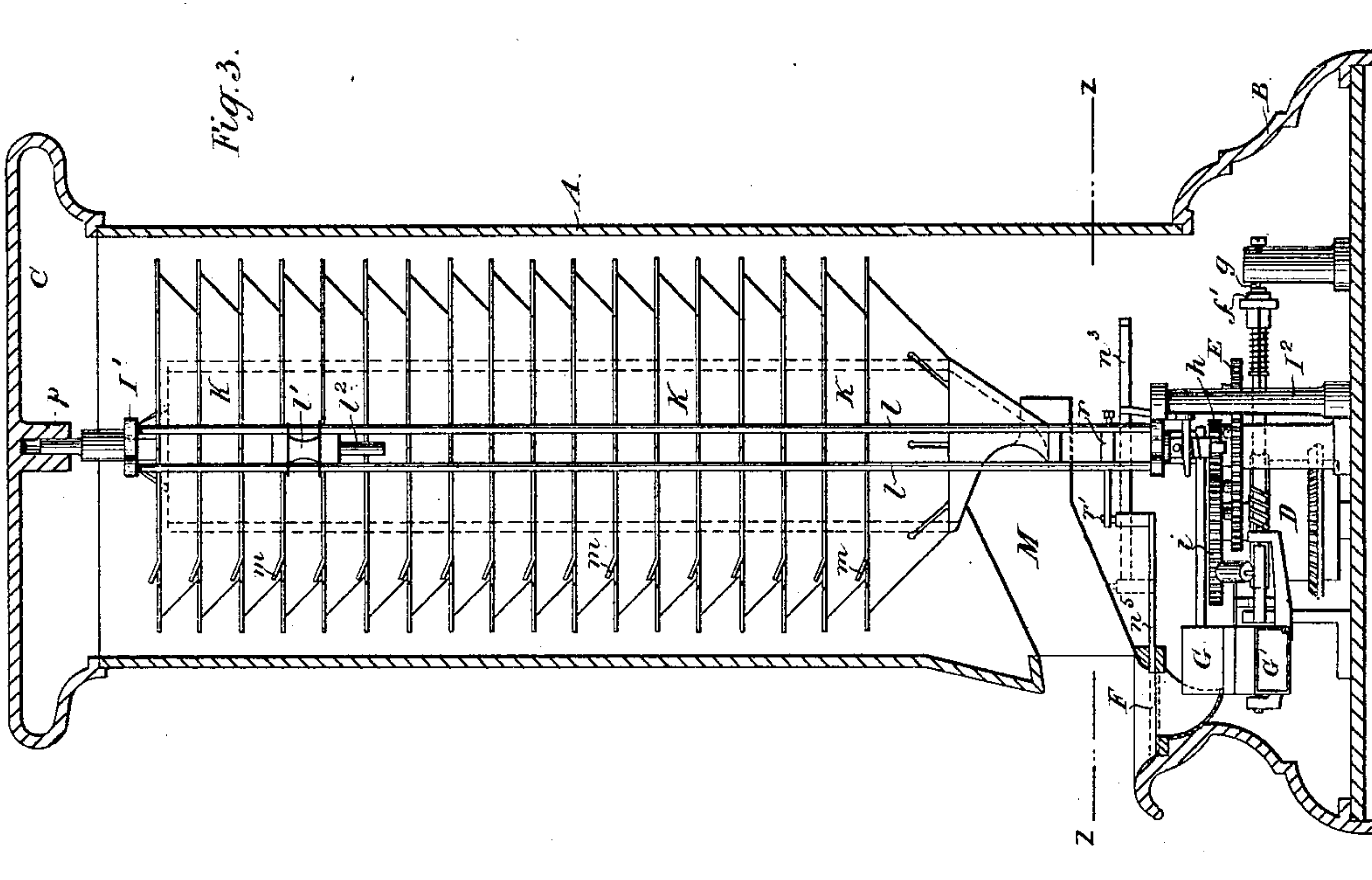
(No Model.)

5 Sheets—Sheet 1.

E. G. HOFFMANN.
AUTOMATIC DELIVERY BOX.

No. 389,225.

Patented Sept. 11, 1888.



Witnesses
Philip H. H. H. H.
Allen R. R. R.

Inventor:
E. G. Hoffmann

(No Model.)

5 Sheets—Sheet 2.

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Fig. 4.

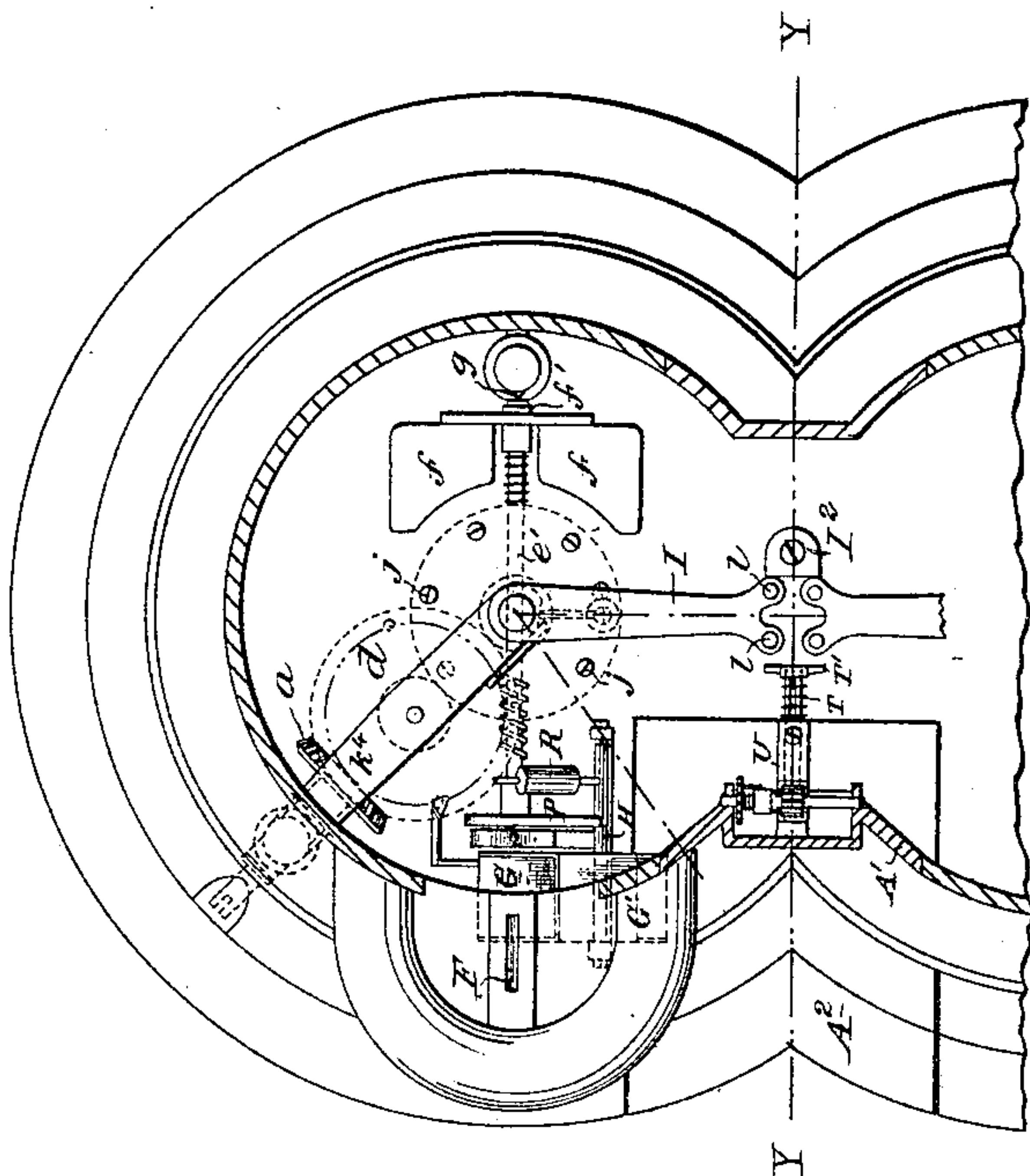
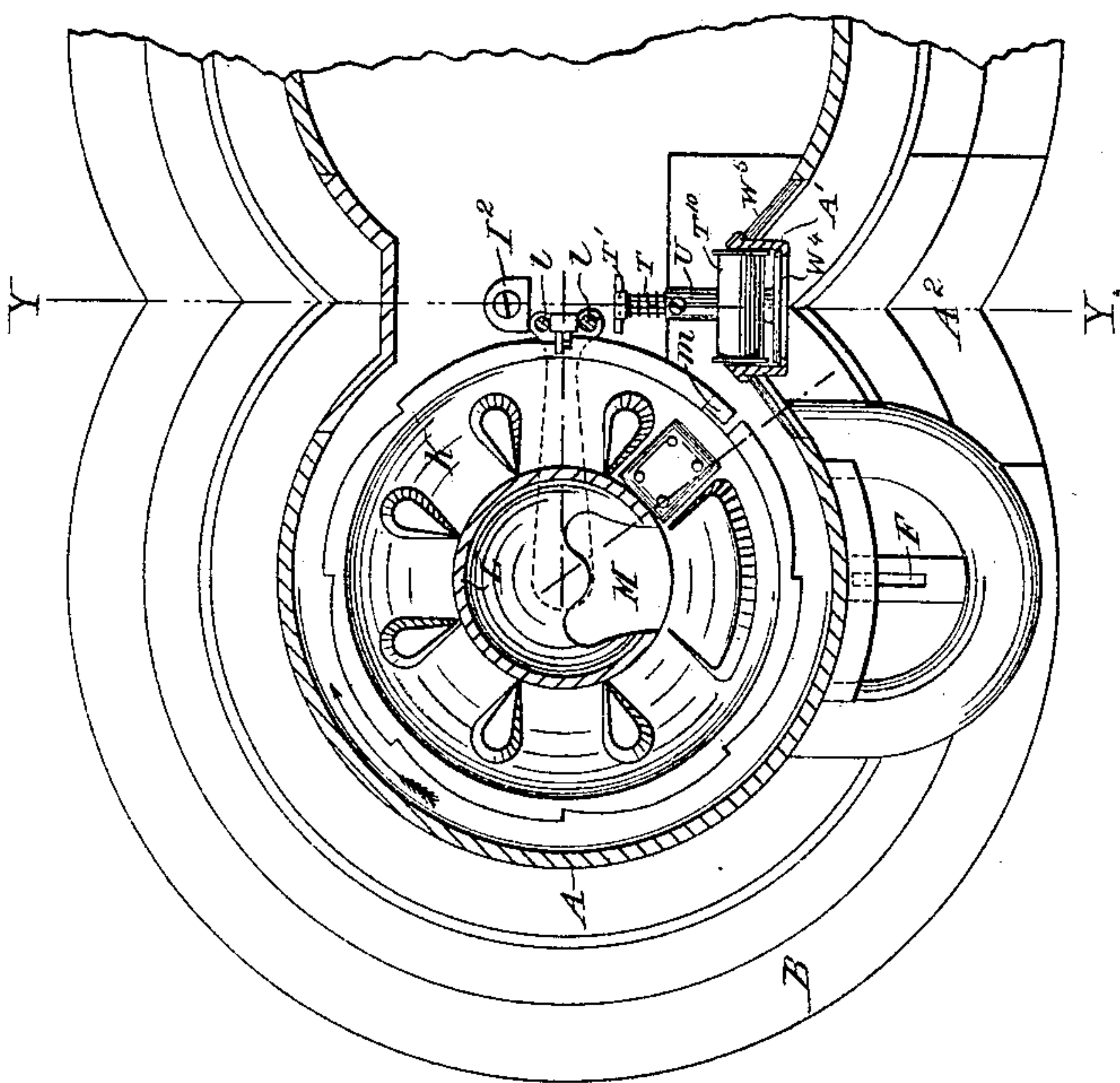


Fig. 2.



Witnesses.

Philip Justice
Allen Jones

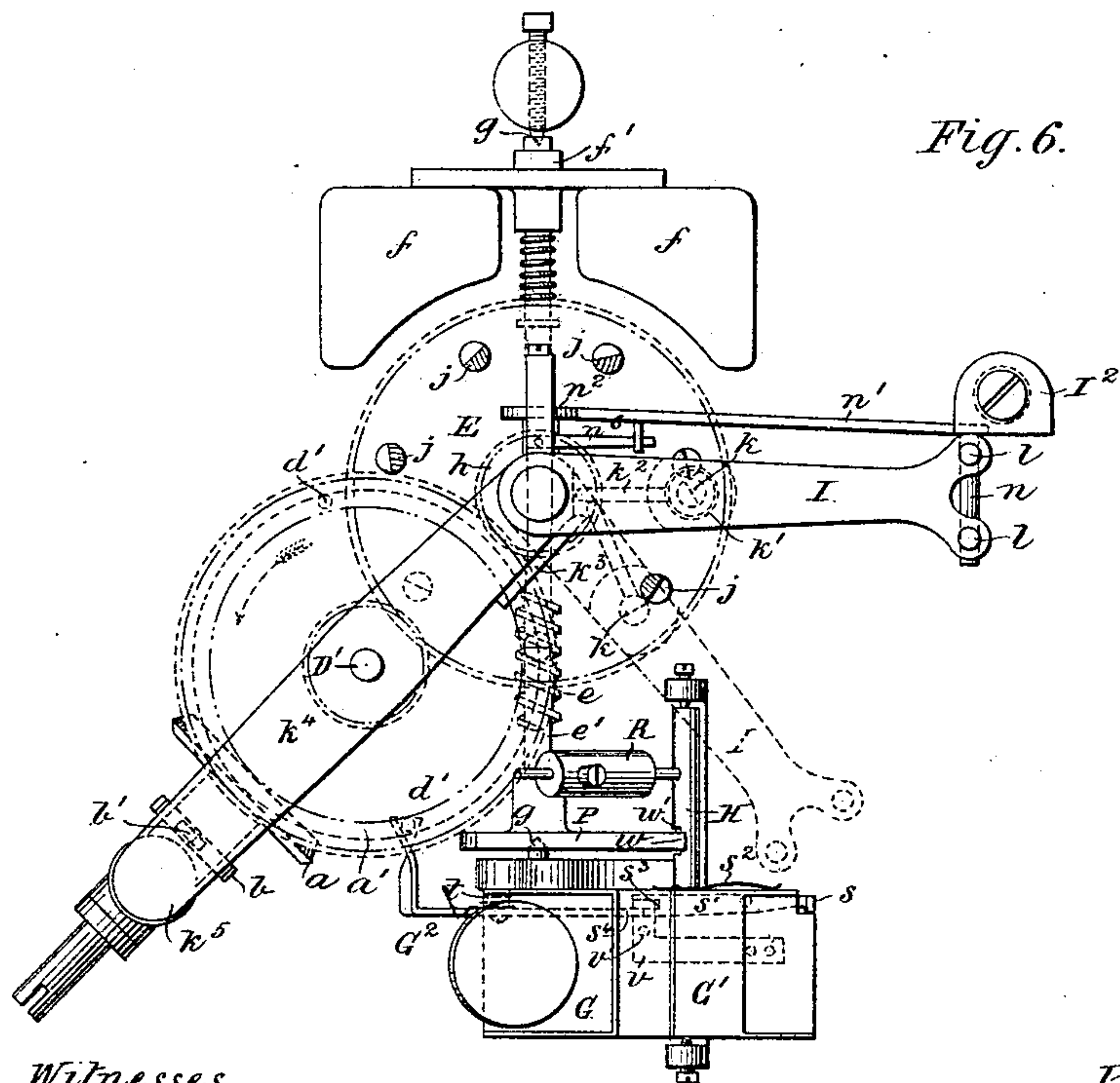
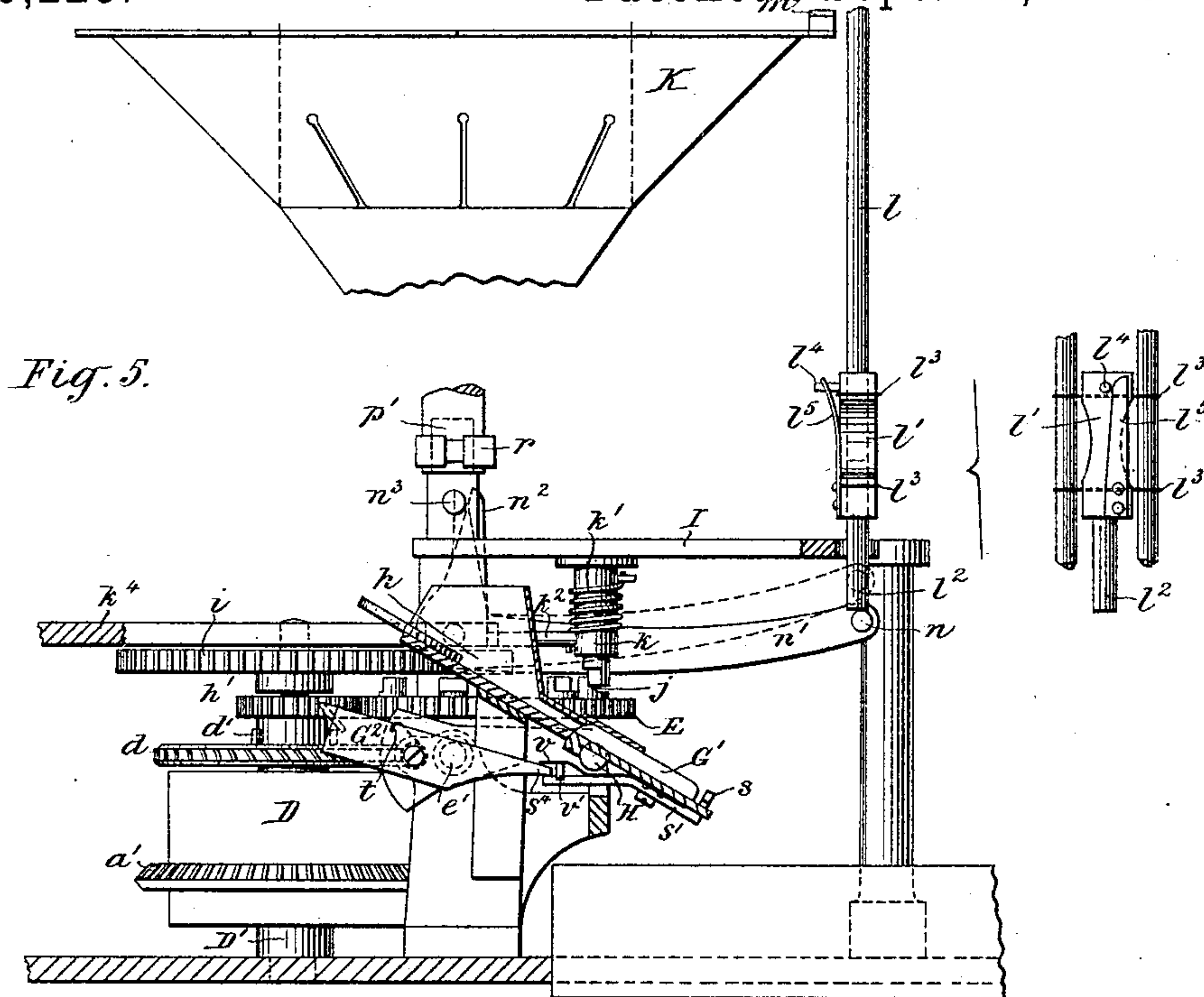
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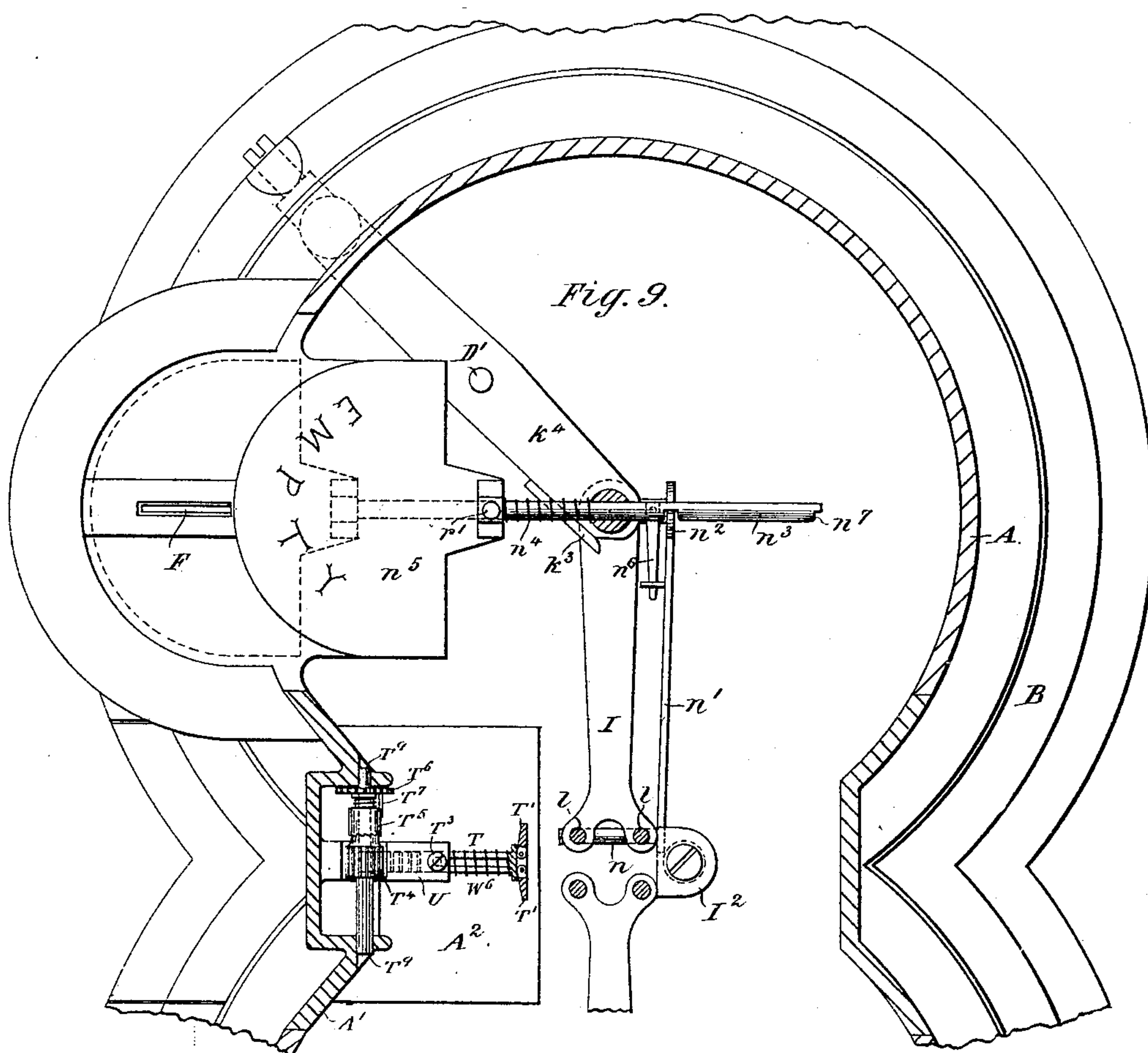
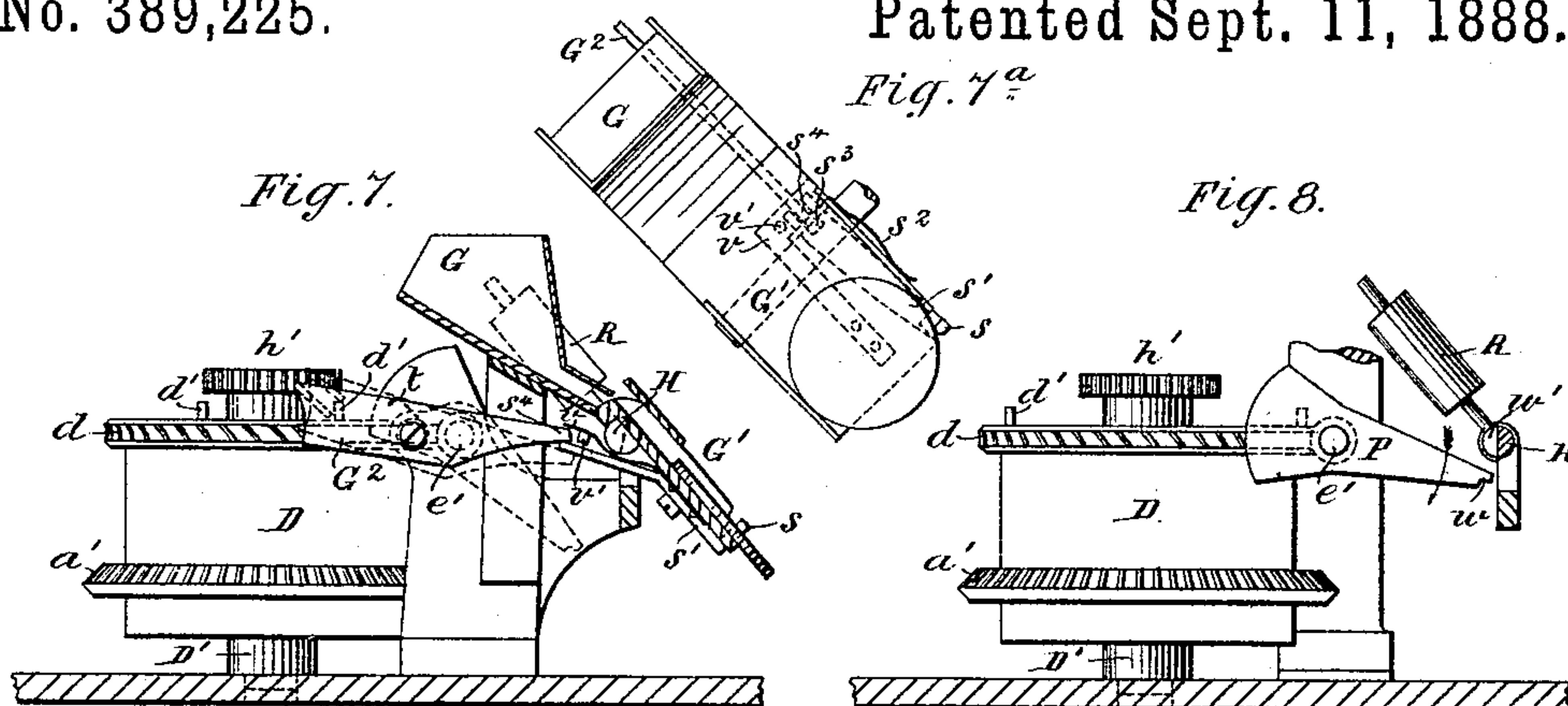
5 Sheets—Sheet 4.

E. G. HOFFMANN.

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No. 389,225.

Patented Sept. 11, 1888.



Witnesses.
Philip M Justice.
Albert J. Jones.

Inventor:
E. S. Hoffmann

UNITED STATES PATENT OFFICE.

ERNEST G. HOFFMANN, OF SOUTHGATE, COUNTY OF MIDDLESEX,
ENGLAND.

AUTOMATIC DELIVERY-BOX.

SPECIFICATION forming part of Letters Patent No. 389,225, dated September 11, 1888.

Application filed October 17, 1887. Serial No. 252,607. (No model.) Patented in England July 12, 1886, No. 9,052.

To all whom it may concern:

Be it known that I, ERNEST GUSTAV HOFFMANN, a subject of the German Emperor, residing at Southgate, in the county of Middlesex, England, have invented a new and useful Improvement in Automatic Delivery-Boxes or similar Apparatus, (in part patented to me in Great Britain under No. 9,052, dated July 12, 1886,) of which the following is a specification.

My invention relates to apparatus which by the insertion of a coin of a predetermined amount will automatically deliver to the person inserting the same the required article and simultaneously operate an endless band having advertisements thereon. As usually constructed, these "automatic delivery-boxes", as they are termed, (at least such as deliver the heavy class of articles, such as chocolate, match-boxes, &c.,) have not been purely automatic, but have required a drawer to be opened or a handle to be operated before the article can be obtained.

The apparatus which I am about to describe will be found to be absolutely automatic in delivering the article without any further action being required from the person than the insertion of the coin, while from its construction articles largely varying in size may be delivered from one machine, while two or more of the machines may be combined in one casing.

To clearly explain the nature of my invention, reference is made to the accompanying drawings, in which—

Figure 1 is a front elevation of the mechanism on the left-hand side of a double machine, the casing and a portion of the trays being shown in section, it being understood that the right-hand side is the same in all its parts. Fig. 2 is a sectional plan view of same on the line $x x$. Fig. 3 is an end view of Fig. 1, the casing being in section. Fig. 4 is a plan of same on the line $z z$. Fig. 5 is an enlarged view of the operating mechanism in the base of the apparatus, showing the coin in the act of entering. Fig. 6 is a plan view of portions of the same. Fig. 7 is a portion of a similar view to Fig. 5, showing the coin about to drop into the receiving-box. Fig. 7^a is a top view of the coin-chute. Fig. 8 is an explanatory

view of one of the movements. Fig. 9 is a view of the arrangement for operating a closing plate when all the articles contained in the apparatus have been delivered, showing also a portion of the mechanism for operating the advertising-band. Fig. 10 is a sectional elevation on the line $y y$, Figs. 2 and 4 showing only the arrangement for operating the advertising-band. Fig. 11 is a front elevation of a double machine, the right-hand portion being broken away. Fig. 12 is a sectional plan on the line $x^2 x^2$, Fig. 10, drawn to a larger scale than latter; and Fig. 13 is an elevation of the mechanism shown in Fig. 12 when viewed from the inside of the machine.

The casing, A, which I prefer to employ is of cylindrical form, as shown, the enlarged base B of which is adapted to contain the actuating mechanism of the apparatus, the upper part, C, forming the cover. To examine the interior of the apparatus and for the purpose of refilling, the portion A' of the casing in front is held in place by lugs on the upper part, (not shown,) which fit under the cover, while the lower part is held in place by some suitable locking device which is not shown. The box A² for containing the coins is of drawer shape and is formed in the base, its position being shown in Figs. 2 and 4. The same locking arrangement which keeps the front A' of the casing in place may also serve to lock the box A².

Before proceeding to describe in detail the construction and operation of my apparatus, I will first describe its general features.

Within the casing A is mounted the tray or trays containing the articles or parcels to be sold, the number of such trays being immaterial, except so far as the capacity of the apparatus is concerned. These trays are supported to be moved in relation to a delivery-passage into which the articles or parcels are dropped, such movement being accomplished by an automatic step-by-step mechanism—that is, a mechanism which makes one step or advance each time the proper coin is deposited, and thereby moves the tray one step to deliver a single article. I may now generally describe this step-by-step mechanism.

A coin having been dropped into the opening F passes on to the coin-chute G, and down

into a species of bottomless box or tray, G' , which, being pivoted on a bar, H , is depressed, the coin being then allowed to fall out. The slight turn given to this bar H permits the escape of an arm through a slot in the same, and, setting free a coiled spring in the barrel D , allows of a gear-wheel, E , being operated, one pin of a number on which carries forward an arm, I , to which are attached two parallel upright rods, a weighted spring-arm on which, catching on one of the nicks on the edges of the trays K , gives the same a partial revolution, bringing one of its divisions containing the article to be sold opposite to the opening into a delivery-chute, consisting of the central cylinder, L , and the slope M , down which the article drops, and is delivered outside onto the projection or tray in which is the orifice F , the arm I , which effected the operation, having returned at once to its original position. At the same time the motion of the arm I , through the agency of the rack-bar T and the spur-wheels T^4 , T^6 , and T^8 , serves to move through a small distance the endless band or ribbon W , upon which advertisements may be displayed, the latter being visible through the glass window W^1 .

The above will explain the general operation of the parts. I will now proceed to describe in detail how the above movements are effected by the action of the coiled spring, and subsequently the operation of the coin-chute which controls the escapement mechanism.

The coiled spring (which is not shown) is attached to the spindle D' , passing through the barrel D , and is wound up from the outside of the casing, as shown in Fig. 4, by a key which fits a squared or slotted head passing through the casing, the turning of which operates a bevel-wheel, a , gearing with the beveled rim a' on the barrel, a ratchet-wheel, b , and pawl b' (shown in Fig. 6) preventing any back movement of the same. The spindle D' , when the escapement is operated by a coin, drives through the gear-wheels a worm-wheel, d , which has at opposite points upon its rim two short vertical pins, d' d' , the purpose of which will be hereinafter explained. This worm-wheel d engages and drives a worm, e , on a rod, e' , which passes through a hole in the central fixed spindle carrying the slotted cylinder and trays holding the articles to be sold or delivered. The rod e' has its bearings at each end upon the points of screws g , carried in short standards, as shown in Figs. 3, 4, and 6. At one end is a fly-wing, f , the purpose of which is to control its speed when revolving. This fly is not fixed upon the shaft, but is pressed against a boss, f' , upon its end by means of a coiled spring, as shown, the object of this arrangement being to reduce the shock to the fly, for though it is carried round with the rod e' , it is permitted by this means to travel slightly onward when the revolution of the rod is stopped. The gear-wheel E is driven from the small gear-wheel h above and made in one piece with it by means of the gear-

wheel i , which is fixed upon the spindle D' , to which the coiled spring in the barrel is attached, while the wheel E in turn drives the smaller gear-wheel, h' , which, being made in one piece with the worm-wheel d , drives that also. Upon the wheel E are arranged, as shown, seven short vertical half-round pins, j . The cut-away portions of these are the outer halves, and, as will be seen in Fig. 6, the flat faces are cut at an angle to the radius of the wheel E . Loosely mounted upon the central fixed spindle is the vibrating frame of the automatic step-by-step mechanism, which consists of an arm, I , on the under side of which is a rod, k , the end of which is cut away to correspond with the pins j . This rod k is capable of turning slightly, and from it projects at right angles a rod, k^2 , against which presses a spring, k' , coiled around the rod k . The end of this rod k^2 bears against a small stop-plate, k^3 , Figs. 6 and 9, on the side of a plate, k^4 , through one end of which the fixed central spindle projects, the other being secured to a standard, k^5 , its center portion serving as a bearing-plate for the spindle D' of the barrel D . The rounded end of this plate around the central fixed spindle is cut away, as shown, to allow of the rod k^2 having a good bearing against the plate k^3 .

The action of the spring through the gear-wheels, as before described, will give the wheel E one-seventh of a revolution, so that when the rod k is in the position shown in Figs. 5 and 6 it will be engaged by one of the pins j upon the wheel E , which will carry the arm I forward until it comes into the position shown in dotted lines in Fig. 6, when the arm k^2 (on account of the shifting of its end to the edge of the plate k^3 , as shown) will have turned the rod k partially round, causing at this point its cut-away portion to correspond with the cut-away part of the pin j , when it will pass the latter and allow of the coiled spring pulling the arm back to its original position. On account of the shifting of the end of the rod k^2 and the manner in which the coiled spring is wound, as shown, upon the rod k , the forward movement of the arm I is not effected against an increasing pressure therefrom through the rod k^2 , but against a lessening pressure, so that when the arm I is in the position shown in dotted lines in Fig. 6, although the coiled spring has sufficient power to bring it back, it has even less power than at its backward point. Thus the return of the arm is not accompanied by any great shock. The outer end of this arm I carries two parallel vertical rods, l , extending to the top of the apparatus, where they are held by a similar arm, I' , loosely mounted on the spindle of the cylinder L , as shown in Figs. 1 and 3. Confined between these two rods is a somewhat heavy sliding catch in the form of a block or gravity-arm, l' , having on its lower end a part, l^2 , the purpose of which will be hereinafter explained. The arm is free to slide up and down between the rods l , but is retained between them by pieces of bent wire l^3 of U

shape, which pass through holes in arm l' , and may be easily withdrawn. When the apparatus is first started, all the pans or trays K around the central cylinder, L, are filled with the articles to be sold, and the arm l' is resting on the edge of the top tray by means of the pin l^1 , which engages therewith, a projecting spring-plate, l^2 , pressing against one of the several notches around the edge of the pan, as shown in Fig. 2. The movement of the arm I will therefore give a turn to this pan, bringing one of the articles in one of the divisions of the same opposite the slot in the cylinder L, down which it will fall, the arm I then moving backward and allowing the spring l^2 to engage with the next notch.

The arms I and I' are prevented from going farther back than is necessary by the stops l^3 , which carry on their ends pieces of rubber or leather to receive the blows. This action is repeated upon the insertion of each coin until all the divisions on the top pan have been emptied, when the pin l^1 on arm l' in its last backward movement will strike the projection m , raised upon the edge of the pan, allowing the pin to drop through the opening beneath the same, and consequently the arm l' to drop, the pin l^1 resting on the edge of the pan beneath. The same backward and forward movement of the arm I is repeated until each pan is emptied, the arm l' falling down as each is emptied to the next. Upon the last pan being emptied the pin l^1 escapes through the slot in the same manner and the arm l' falls down into the position shown in Fig. 5, when the lower part, l^2 , strikes the pin n on the arm n' , pressing it from the position shown in dotted lines to that shown by the full lines, drawing back the arm n^2 out of a slot cut in the rod n^3 , which permits a spiral spring, n^4 , to shoot forward the signal-plate n^5 , (shown in Fig. 9,) which then covers the coin-opening F. A small spring, n^6 , pressing against a pin on bar n' , keeps the arm n^2 against the rod until said arm is forced into the nick n^7 in the end of the rod, which prevents the signal "Empty plate" being pushed backward from the outside.

The support for the pans K, which in the construction shown is the cylinder L, and with it the pans K, may be revolved by hand for convenience of filling, as in this way the attendant can fill one division of each pan from top to bottom, and, after giving the cylinder a turn, the next set of divisions from top to bottom, and so on, thus obviating the necessity of turning each pan around on the cylinder to fill each division. The pans are made of thin metal, the lower portion of each being slightly cut or slit, as shown in Fig. 5, so that it may be forced onto the cylinder L and held by pressure only in grooves o formed around the cylinder, the one for the top pan being shown in Fig. 1. This allows of the pans turning round on the cylinder, and also permits of their being readily removed therefrom, so that, if desired, any number may be omitted to

allow of larger articles being placed in the others for sale. Each pan is shown as having divisions for seven articles, and also a large blank space which remains opposite to the slot in the cylinder until the pan is started.

The ends of the cylinder-supports for the pans are terminated by two short spindles, the upper turning in a bearing, p , in the cover, while the lower fits over the turned-down head p' of the central fixed spindle. This, as will be seen, allows of the cylinder turning for the purpose before described; but to prevent this happening while the pans are being turned round by the action of the arm I, I place a collar, r , upon the lower spindle. This has a short forked arm, (shown in Fig. 3,) the end of which engages with a pin, r' , on the "empty" plate n^5 , so that when the latter is held back (as it is when the apparatus has any articles left in it) the cylinder support is unable to turn; but when this plate is shot forward by the spiral spring the pin r' is carried out of the forked arm, and the support may be turned when the attendant opens the casing.

The operation of the coin-chute which controls the escapement is as follows: The coin falls from the orifice F down the stationary portion of the chute G into the bottomless tray G' or pivoted portion of the chute, (pivoted on the bar H,) where it is caught by the projection s on the lever s' , which is pivoted on the bottom of the tray or tilting portion G', as shown, and operates a lock, which consists specifically of the devices next to be described, and which normally holds the pivoted tray portion G' of the chute in line with the stationary part thereof. The fall of the coin then presses aside this projection s on lever s' against the action of a spring, s^2 , (shown in Figs. 6 and 7^a,) and brings a slot, s^3 , in the other end of the lever opposite the pointed end s^1 of a pivoted bent metal plate or support, G²—that is to say, from the position shown in Fig. 6 to that shown in Figs 7 and 7^a, (the position of the point s^1 being that shown in dotted lines,) which figures show the coin after having tilted the tray G' in the act of opening the arm s' before falling into the coin box or receptacle. This tilting movement allows the forked end s^3 of the lever s' to pass the pointed end s^1 of the arm G², the forked end of the lever occupying the position shown in the full lines in Fig. 7. The plate G² at the point where it is pivoted, as shown in Fig. 6, is acted upon by a small spiral spring, t , the end of which, being turned over the same, draws the outer end of the arm smartly down, thus raising the pointed end s^1 into the position shown in full lines, thus following the upward movement of the lever s' , passing through the slotted end s^3 of said lever. This allows of the forked end of this lever s' taking a slight further movement sufficient for the diameter of the coin, which then falls into the coin-receptacle. The end s^1 of the arm G² has already struck a spring-plate, v , the lower end of which is secured to the under side of the tray G', as shown in

Figs. 6, 7, and 7^a. From this plate projects a stop-pin, v' , which limits the movement of the forked end of lever s' , as shown in Fig. 7^a. The end s^4 of the arm G^2 , pressing against this spring-plate, causes the tray G' to be kept depressed, and the depressing of this tray causes the turning of the spindle H , (and at the same time blocks the opening from chute G , as shown, which prevents a further coin being inserted till the first has completed its action,) allowing the notched end w of an arm, P , on the worm-shaft e' to escape through a slot, w' , on same, thereby setting the mechanism free and allowing the worm e , arm P , and fly f to revolve the number of times which it is set to do. The upward movement of the end s^4 of the arm G is effected by the forward movement of the worm e , which turns the worm-wheel d and moves forward the pins d' on said wheel, thereby allowing the end of the arm G^2 (which, as shown, is bent at right angles and again twisted) to fall from the position shown in dotted lines, Fig. 7, to that shown in full, when it presses on the rim of the worm-wheel d , which meanwhile is turning round until the second pin, d' , strikes against and lifts it, thus causing the pointed end s^4 to be withdrawn from the plate v , pressing down the end of the forked lever s' , which has taken its original position beneath it, and causing the tray G' to resume its normal position, (shown in Fig. 5.) thus turning the shaft H and causing the end w of the revolving arm P to be arrested thereby. As before explained, this escapement of the arm P has set in motion the spindle D' , causing through the gear-wheels one of the pins j on wheel E to carry forward the arm I , the rod k on which, at the moment the arm P is arrested, escapes from the pin j and allows the arm to resume its original position, after having performed its duty of operating one of the pans K , as previously described. The movement of the tray G' back to its original position is assisted by the adjustable counter-weight R , secured on an arm projecting from the shaft H , as shown. When the tray G' has resumed its original position, the end s^4 of the arm G^2 is above the solid portion of the forked end of the lever s' , as shown in Figs. 5 and 6, so that the tray is prevented from being tilted or depressed by the passage down it of any smaller coin or article than that determined upon, as the lever s' must be pressed aside before the tray can be depressed and the escapement operated. It will be evident, therefore, that the position of the projection s on said lever will determine the size of the coin which will operate the apparatus, and this can be so nicely adjusted that a coin less than one thirty-second of an inch smaller than that determined upon will pass by without operating the same. Such a coin may be received into a separate channel and passed out of the apparatus. This may be conveniently done by placing the open mouth of a channel communicating through the casing in front of the tray G' when it is in

its position at rest; but any coin operating the same will of course depress it and drop underneath the channel into the coin-receptacle. 70

As before stated, the motion of the arm I is also used to move an endless band or ribbon, W , upon which advertisements or announcements may be displayed. Figs. 2, 4, 9, 10, 11, 12, 13 show details of the mechanism by which this is effected. 75

W is an endless band or ribbon upon which the advertisements or announcements are displayed, a suitable opening in the removable door A' of the casing being provided in front of W and fitted with glass W^4 . This opening or window is in height and width slightly less than the band W . The band W is carried on flanged rollers at top and bottom, as shown at W' and T^{10} , Fig. 10, respectively. The lower roller, T^{10} , revolves on a fixed spindle, T^{11} , while the upper roller, W' , is carried in a light brass frame, W^2 , which is held in position by the screw W^3 . This screw fits in a deep recess in the top of A' and has a spiral spring under its head, as shown in Fig. 10, the object being to maintain a gentle and constant tension upon the band W , unaffected by any stretching or contraction of the latter. To the roller T^{10} is firmly fixed the spur-wheel T^8 , which is in gear with the spur-wheel T^6 . As shown in Fig. 12, the spur-wheel T^6 is provided with a long tubular part and revolves freely upon the fixed spindle T^9 . 80 85 90 95

T^5 is a bush or sleeve which can slide freely on the tubular part of T^6 , but is compelled to rotate therewith by means of the small pin T^7 , fixed rigidly in T^6 and fitting freely in a groove in T^5 . A light spiral spring between T^6 and T^5 continually tends to separate the two. Upon one end of the sleeve T^5 are cut ratchet-teeth which engage with similar teeth on the side of the pinion T^4 , as shown in Figs. 9 and 13. The pinion T^4 runs freely on the fixed spindle T^9 , end play being prevented by the shoulder thereof. 100 105 110

It is obvious that if the pinion T^4 be rotated in one direction the sleeve T^5 will be caused to rotate, and with it the spur-wheels T^6 and T^8 and roller T^{10} , while if the pinion T^4 be rotated in the reverse direction the ratchet-teeth thereon will simply slip over those on the sleeve T^5 , and, in consequence, the roller T^{10} will not be moved. The pinion T^4 is in gear with a cylindrical rack-bar, T , which has rack-teeth cut on its upper surface, and slides freely in the horizontal guide or socket U , a portion of the latter being cut away to permit of the pinion T^4 gearing into the rack-bar, as shown in Fig. 10. This rack-bar T is prevented from rotating and its end travel is limited by the set-screw T^3 , which enters a suitable slot cut on the top side of bar T . A spiral spring, W^6 , surrounding bar T , keeps the latter normally in the position shown in the figures. The end of the rack-bar T is provided with a pair of pawls, T' T' . These pawls are retained by light springs normally in the position shown in Fig. 12, but can be deflected against the 115 120 125 130

action of said springs into the positions shown in dotted lines in Fig. 12.

The operation of the parts is as follows, the mechanism being in the position shown in the figures: When the arm I is set in motion by the deposit of a coin, as hereinbefore described, one of the upright rods *l* encounters one of the pawls *T'* on the end of rack-bar *T* and drives the latter into the guide or socket *U* a certain distance against the action of the spring *W*⁶. As the rod *l* moves over a circular path, it becomes disengaged from the pawl *T'* before arriving at the end of its throw, and the pawl *T'* being thus released, the rack-bar *T*, under the influence of the spring *W*⁶, immediately returns to the position shown in the figures. The object of the movable pawls *T'* is to allow the rods *l* on their return to pass the latter and so reassume the position shown in the figures. In this way a step-by-step motion is imparted to the endless band *W*, which is moved a short distance on each occasion that a coin is deposited in the machine.

I do not wish to be limited to the precise construction of devices whereby my invention is illustrated in this present case, as it is evident that, to one skilled in the art, various mechanical equivalents for many of the devices would suggest themselves without departing from the spirit of my invention, and such equivalents or variations I desire to be understood as being within the scope of my present invention.

What I claim is--

1. In automatic delivery-boxes, the combination of a slotted cylinder, one or more circular trays arranged concentrically around the said cylinder, having parcel-compartments and adapted to be revolved past the slot in the cylinder to successively deliver the parcels thereto, and automatic step-by-step mechanism for revolving the tray or trays past said slot, substantially as described.

2. In automatic delivery-boxes, the combination of a slotted vertically-arranged cylinder, a series of trays arranged one above the other, having parcel-compartments, and automatic step-by-step mechanism for moving said trays successively past the slot in said cylinder, substantially as described.

3. In automatic delivery-boxes, the combination of a slotted vertically-arranged cylinder, a series of circular trays arranged one above the other and centrally around said cylinder, having parcel-compartments, and automatic mechanism for moving said trays successively past the slot in said cylinder by a step by-step motion, substantially as described.

4. In automatic delivery-boxes, the combination of a series of parcel-holding trays arranged one above the other, a delivery-chute into which the parcels are delivered from said trays, a vibrating arm carrying guide-rods, and a weighted catch free to slide on said rods engaging with said trays successively to move them as the said arm is reciprocated, substantially as described.

5. In automatic delivery-boxes, the combination of a series of circular parcel-holding trays having their edges slotted and arranged one above the other, a delivery-chute into which the parcels are delivered from said trays, a vibrating arm carrying guide-rods, and a weighted catch free to slide on said rods engaging with the edges of said trays successively and being adapted to successively drop through the slots in the edges of the trays after they have been moved to deliver their contents, substantially as described.

6. In automatic delivery-boxes, the combination of a series of circular parcel-holding trays arranged one above the other and having their edges notched and provided with slots, adjacent to which are directing projections *m*, a delivery-chute into which the parcels are delivered from the trays, a vibrating arm carrying guide-rods adjacent to the edges of the trays, and a weighted catch, *l'*, free to slide on said rods, supported by the edge of the trays and adapted to move the trays, substantially as described.

7. An apparatus comprising a parcel-holding tray, a delivery-chute into which the parcels are delivered from the tray out of the apparatus, a vibrating arm carrying a slide provided with a catch which engages with the tray for imparting thereto a step-by-step motion, a spring-actuated signal-plate, and a catch for holding said signal-plate against the action of the spring, said catch being arranged below the tray in the path of the said slide, whereby it is actuated by the falling thereof, substantially as and for the purpose set forth.

8. An apparatus comprising a parcel-holding tray, a delivery-chute into which the parcels are delivered from the tray, a vibrating arm carrying vertically-arranged guide-rods, a slide mounted on the said rods and adapted to engage with and move the tray as the arm is vibrated and to be disengaged therefrom and to fall when the last parcel is delivered, a signal-plate, a spring-actuated rod carrying the signal-plate, and a catch arranged below the tray in the path of the falling slide for holding the rod against the action of the spring, substantially as described.

9. An apparatus comprising a parcel-tray, a delivery-chute into which the tray delivers the parcels, a vibrating arm carrying a catch, *l'*, free to slide on a guide and arranged to be disengaged to permit it to fall upon a predetermined movement of the tray, a plate, *n*⁵, adapted to cover the coin slit of the device, a spring-actuated rod having notches or slots formed therein, and the trip-arm *n'*, operated by said sliding catch to engage with the notches in the spring-actuated rod to lock it in its forward and back positions, substantially as described.

10. In automatic delivery-boxes, the combination of a series of trays mounted one above the other upon a central cylindrical support, upon which they are free to turn independently thereof and of each other, supports in which

said central support is mounted and is free to turn, and a stop device which holds the said central support against rotation during the turning of the trays, substantially as described.

5 11. An apparatus comprising a series of trays mounted one above the other upon a central revoluble cylindrical support, upon which they are adapted to turn independently of each other, a signal-plate which indicates when
10 the trays are empty, a stop device with which said signal-plate engages for holding the said central support against rotation, and a trip device operated when the last parcel is delivered for operating the signal-plate and simultaneously releasing or unlocking the central
15 support, substantially as described.

12. An apparatus comprising a series of trays having slotted edges mounted one above the other upon a central revoluble cylindrical
20 support, upon which they may turn independently of each other, a vibrating arm carrying guide-rods, a catch device carried by said guide-rods, engaging with the edges of the trays to move them as the arm vibrates and to
25 successively fall from one to the other as the slotted portions come opposite said catch, a signal-plate carried by a spring-actuated rod, n^s , from which projects a pin, r' , a stop-arm carried by the revoluble support, adapted to
30 be engaged by said pin when the signal-plate is pushed in, and a trip-lever for releasing the rod to permit it to be actuated by a spring having a portion lying in the path of said weighted catch devices, substantially as described.
35

13. In automatic delivery-boxes, the combination of a tray, a delivery-chute into which the parcels are delivered therefrom, a vibrating arm carrying a catch for moving the trays,
40 a clock mechanism having a breaking engagement with said arm to move it, a spring for returning the arm to its normal position, and an escapement operated by the coin for setting off the clock mechanism, substantially as described.
45

14. In automatic delivery-boxes, the combination, with the trays and the catch for moving them, of the arm I, moving said catch and carrying a rod, k , having a bearing-face, j , and
50 a wheel carrying a pin or pins engaging with the bearing-face of the rod to move the arm I, the bearing-face j moving out of the path of the pin upon the wheel to permit the arm I to return to its first position, substantially as described.
55

15. In automatic delivery-boxes, the combination, with the trays, of a vibrating arm, I, carrying a rod capable of a limited turning

movement and having a bearing-face, j , a spring-arm projecting from said rod and resting against a fixed bearing, and a wheel carrying a series of pins engaging with the bearing-face j of the rod to move the arm, substantially as described. 60

16. In automatic delivery-boxes, the combination of the coin-chute having a pivoted tilting portion, a lever having a projection in the path of the coin, a lock for holding the pivoted portion of the chute in line with the stationary part thereof and which is released when the
70 said lever is moved, and a clock mechanism including an escapement which is locked by the tilting portion of the chute, substantially as described.

17. In automatic delivery-boxes, the combination of the coin chute having a pivoted tilting portion supported upon a shaft, H, a lever having a projection in the path of the coin, a lock for maintaining the tilting portion of the chute in plane with the stationary part thereof, arranged to be released by said lever, a clock mechanism including an escapement which is released by the tilting of the pivoted portion of the chute, and a support for maintaining the said pivoted portion in its tilted position
85 during the operating of the clock mechanism, substantially as described.

18. An apparatus comprising the parcel-trays, a vibrating arm for moving the trays to deliver the articles carried thereby, a movable advertising-strip, supports for the strip,
90 and a projection in the path of the vibrating arm to be engaged and moved thereby and connected to move the advertising strip, substantially as described. 95

19. An apparatus comprising the parcel-trays, a vibrating arm for moving the trays, a flexible strip supported by rollers, gearing for rotating said rollers operated at each vibration of the tray-moving mechanism to move
100 the strip, substantially as described.

20. An apparatus comprising the parcel-trays, a vibrating arm for moving the trays, a strip supported at one end by a roller, a loose gear clutched to the roller when moved in one
105 direction, and a spring actuated bar arranged to be moved by the vibration of the frame, engaging with said gear to move the same, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses. 110

E. G. HOFFMANN.

Witnesses:

PHILIP M. JUSTICE,
ALLEN N. JONES.