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J. M. SULLIVAN.

COIN OPERATED PLANETARIUM.

No. 525,397. Patented Sept. 4, 1894.

Fig. 1.

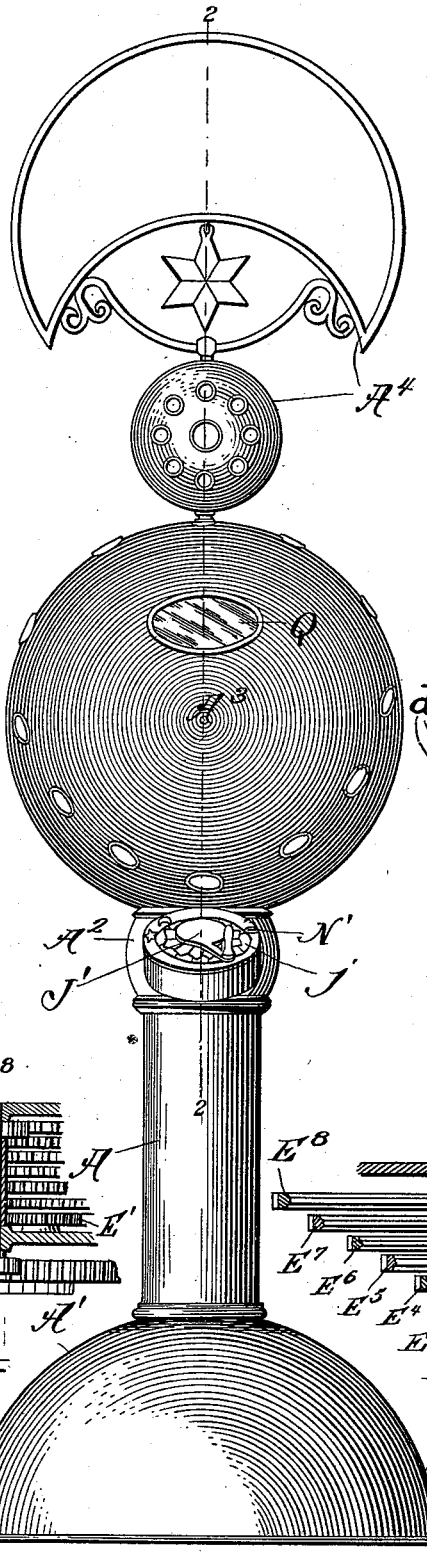

Fig. 14.

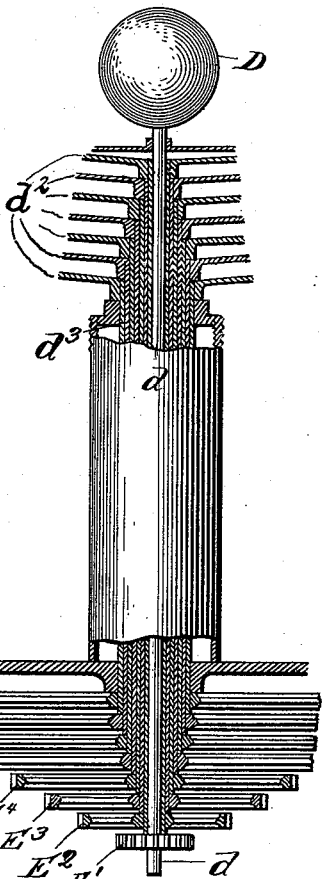

Fig. 15.

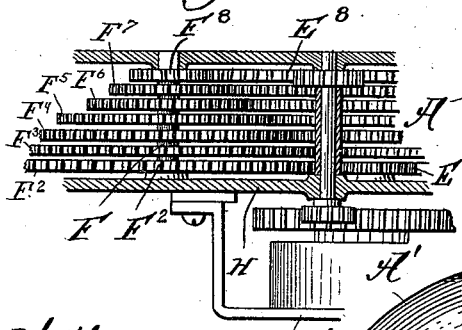

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Fig. 2

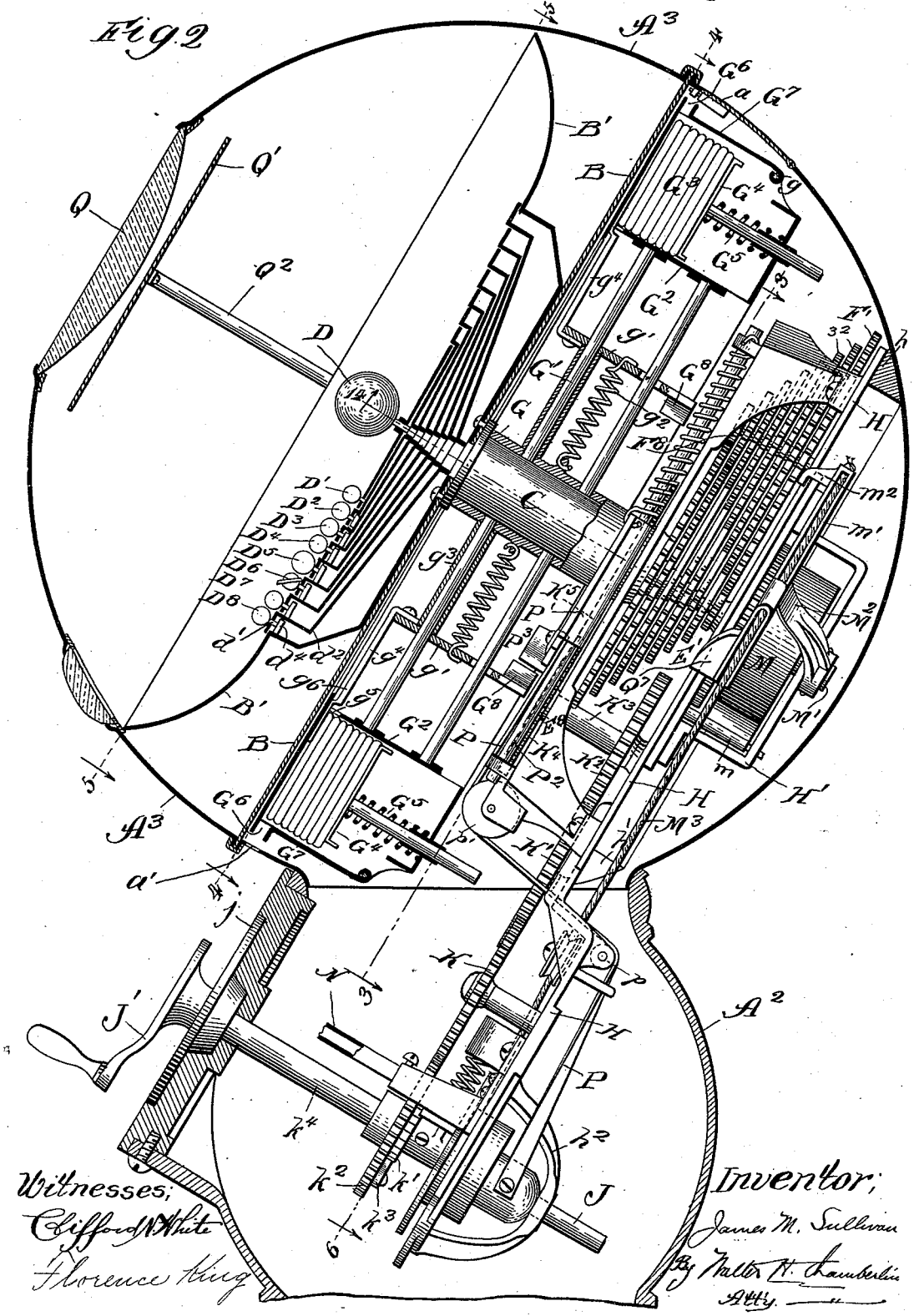

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Fig. 3.

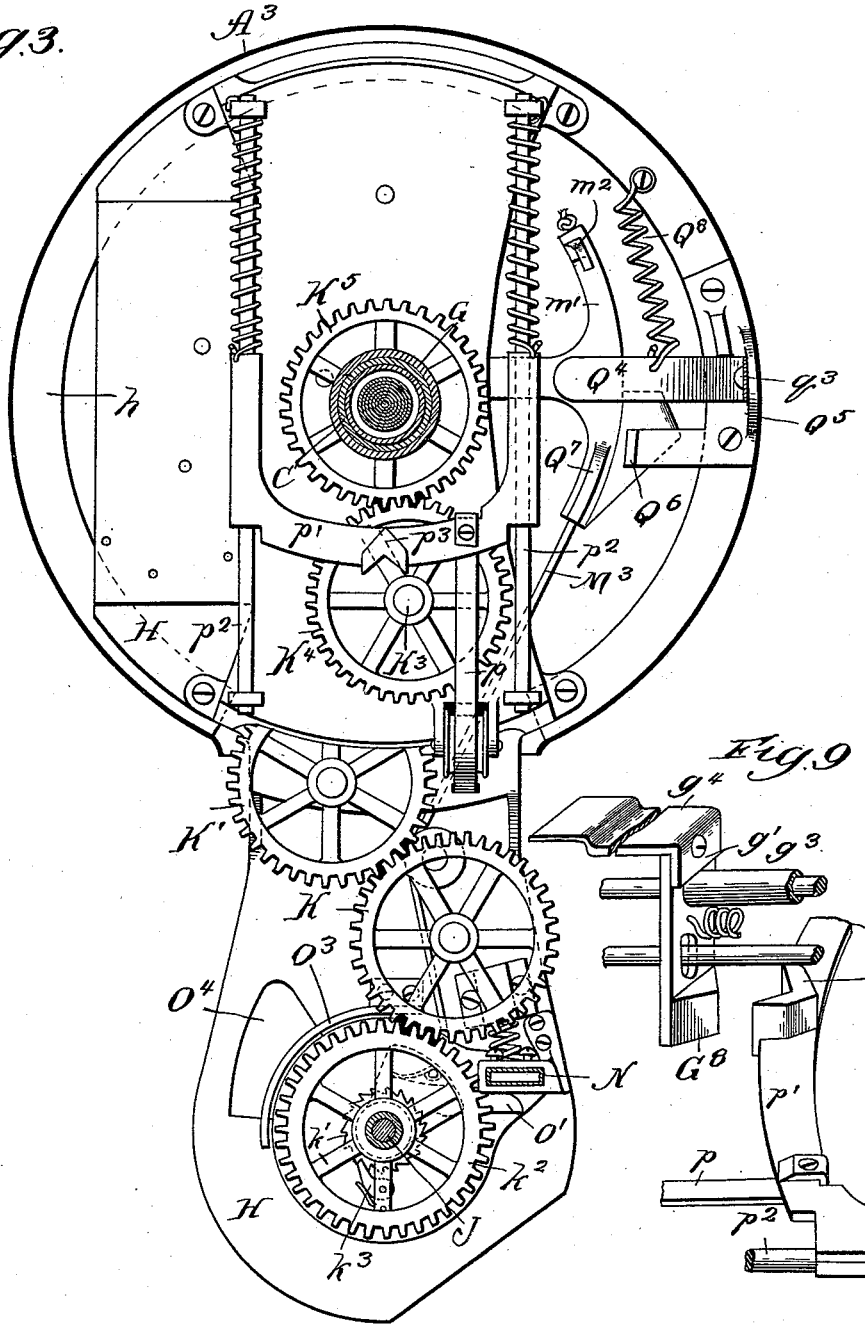

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Fig. 4.

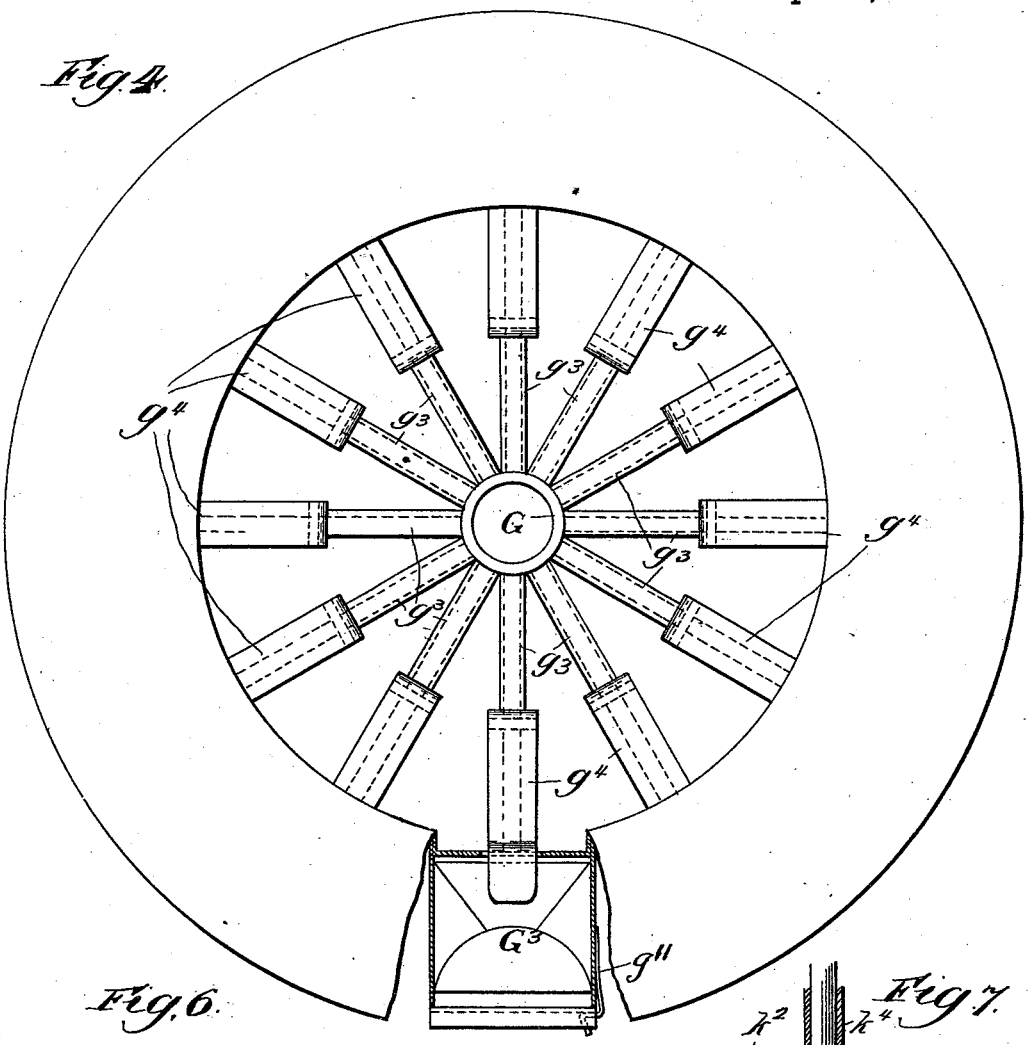

Fig. 6.

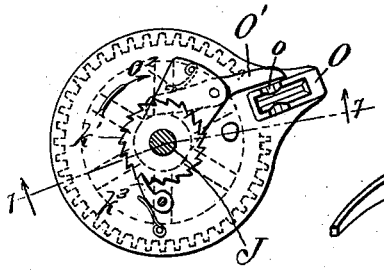

Fig. 8.

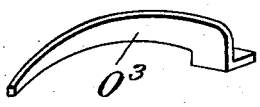

Fig. 7.

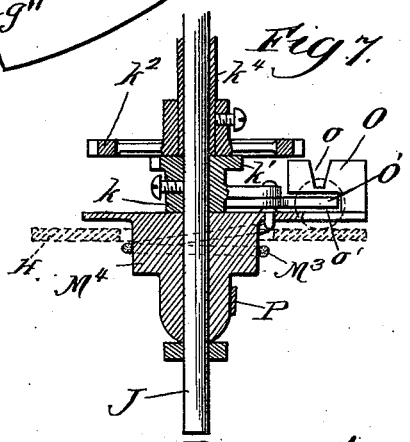

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Fig. 5.

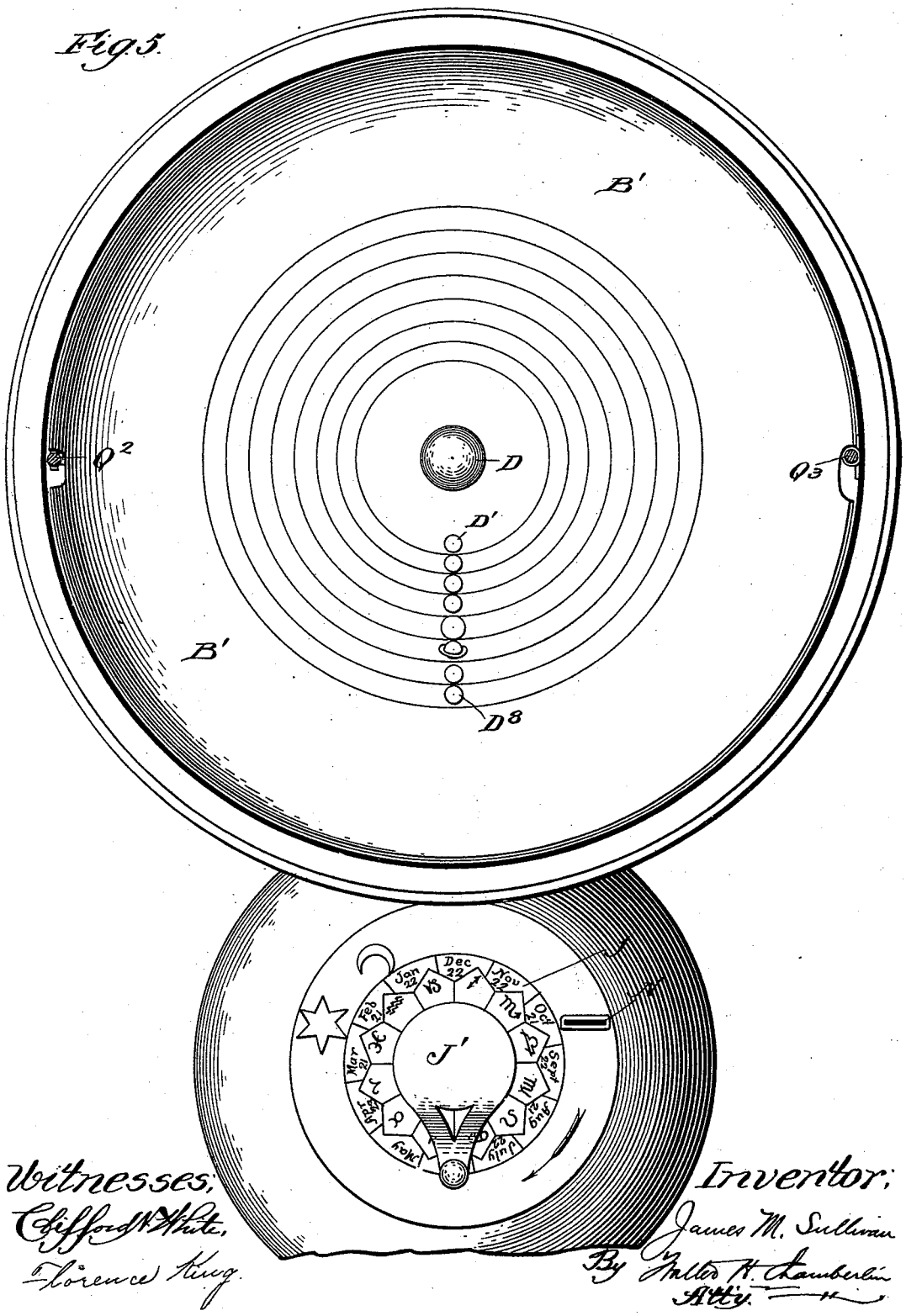

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Fig. 10

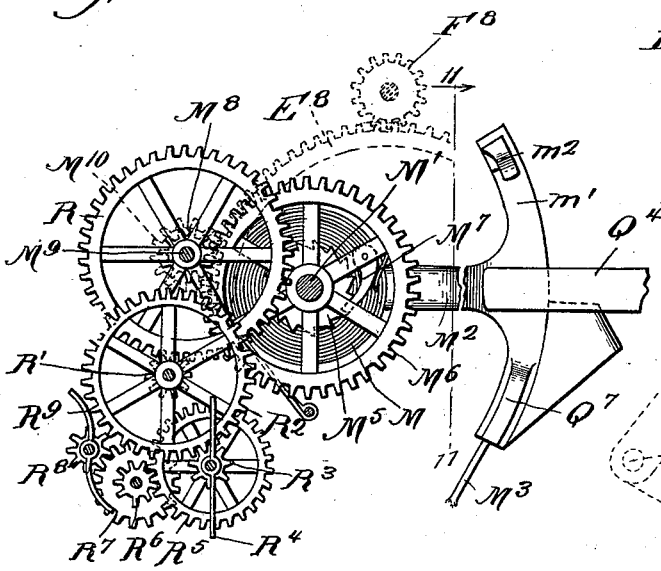


Fig. 11.

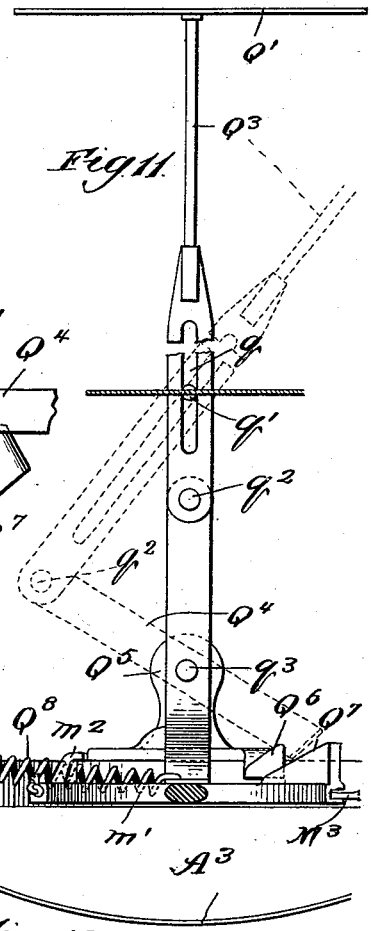


Fig. 12.

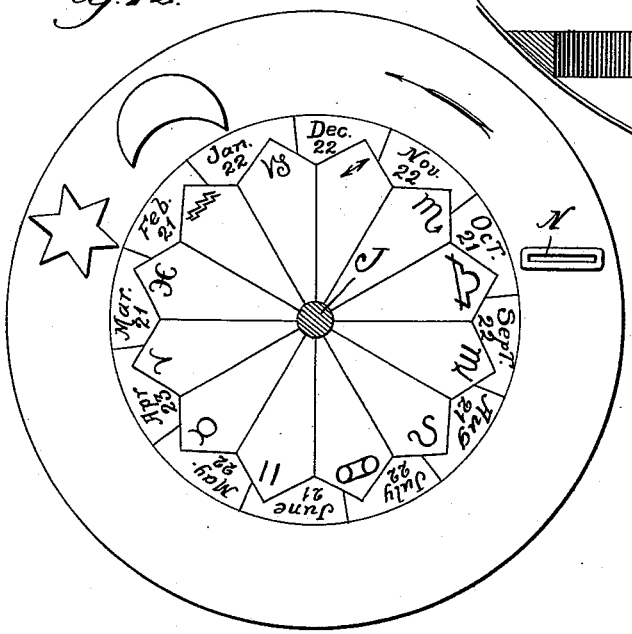
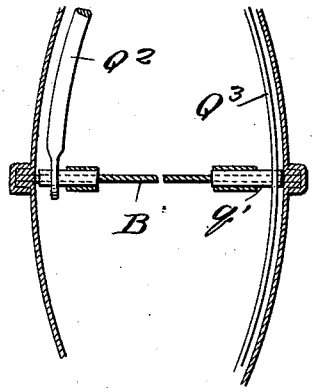


Fig. 13.



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UNITED STATES PATENT OFFICE.

JAMES M. SULLIVAN, OF CHICAGO, ILLINOIS.

COIN-OPERATED PLANETARIUM.

SPECIFICATION forming part of Letters Patent No. 525,397, dated September 4, 1894.

Application filed November 11, 1893. Serial No. 490,625. (No model.)

To all whom it may concern.

Be it known that I, JAMES M. SULLIVAN, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Planetariums; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the production of a coin operated machine wherein is provided upon the interior of a hollow globe, a central body representing the sun and a series of smaller bodies revolving around the central body, said smaller bodies representing the various planets and revolving at different speeds.

The object of the machine is to provide a coin operated planetarium whereby upon the placing in the machine of a predetermined coin the planets will be revolved under the inspection of the operator.

The invention consists in the combination of devices and appliances hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a section on the line 5—5 of Fig. 2. Fig. 6 is a detailed view in section on the line 6—6 of Fig. 2. Fig. 7 is a section on the line 7—7 of Fig. 6. Fig. 8 is a detail of a portion. Fig. 9 is a detail in perspective of the mechanism for discharging the envelope or card. Fig. 10 is a plan view of the spring mechanism and escapement. Fig. 11 is a section on the line 11—11 of Fig. 10. Fig. 12 is an enlarged view of the dial. Fig. 13 is a detailed view of the curtainholder. Fig. 14 is a sectional view on the line 14—14 of Fig. 2. Fig. 15 is a detail showing the gears F^2 to F^8.

In carrying out the invention A represents a suitable upright or standard provided with a base A′ and provided on its upper end with a small hollow globe A^2 and above this a larger hollow globe A^3, the latter if desired being surmounted by suitable ornamental work A^4. Within the globe A^3 and the smaller globe A^2, or perhaps more strictly speaking the upper end of the standard is contained the operative mechanism of my device.

B is a plate which divides the globe A^3 into two sections and extending from this plate up to the edge of the globe are wings B′. Mounted on this plate B is what may be termed the main axle C.

D is the body representing the sun mounted upon a shaft d (shown in detail in Fig. 14) and D′ to D^8 represent the bodies supposed to represent the planets. Each of these bodies is mounted upon a spindle d' which extends through a plate d^2, the latter being bent at right angles to itself extending back toward the rear portion of the globe and then again bent and brought down to a point adjacent to the main axle. It is here engaged to its corresponding axle d^3. The latter extends through the main axle and on the opposite end each axle d^3 is provided with a gear E′ to E^8, the gear E^8 being the largest and the others reducing in size to the gear E′. Meshing with the gears E′ to E^8 is a series of gears F′ to F^8, the gear F^8 (which meshes with the gear E^8) being the smallest and increasing in size to the gear F′ which meshes with the gear E′. These gears F′ to F^8 are stationarily mounted upon a single shaft F which is driven by suitable spring mechanism hereinafter described so that when the shaft F is revolved the body D will be revolved upon its own axis and each of the bodies D′ to D^8 will be revolved around the body D.

If desired the shaft or spindle d' of each body D′ to D^8 may be provided on its opposite end with a friction roller d^4 Fig. 2. This roller bears against the plate d^2 of the next adjacent body so that when the plates d^2 are revolved at different speeds the friction of the roller d^4 against the adjacent plate will give each body D′ to D^8 a rotation on its own axis. Mounted upon the main axle C is a wheel provided with a hub G and a series of arms or spokes G′. On the outer ends of these spokes is supported a series of receptacles G^2 in which may be placed cards, envelopes or the like G^3. Each receptacle is provided with a false bottom G^4 forced outward by the spring G^5. The receptacle is also provided with an

opening or slot G^6 through which the top envelope or card may be forced. The front edge G^7 of the receptacle is pivoted at g and in the case or main globe at a is a hinged door whereby, when the door a is opened and the door G^7 of the receptacle thrown down the receptacle may be filled. The door G^7 is held normally in the position shown in Fig. 2 by a spring g^{11} shown in Fig. 4.

In the under side of the globe is a slot a' through which one of the cards or envelopes may be forced by the mechanism which I will now describe.

Mounted upon the spokes G′ is a plate g' held normally in its position nearest the shaft or center of the globe by a spring g^2. Mounted on this plate is a sleeve g^3 which slides on one of the spokes or arms G′ to form a stop and also to steady the plate g' and hold it in position. Extending from this plate is an arm g^4 which extends through an opening g^5 in the plate G^2 of the receptacle. On this arm is a corner or projection g^6, which, when the arm is forced outward engages the top envelope or card and forces it through the slot G^6. Now as will be seen by turning the wheel so that the proper receptacle is before the slot a' in the large globe and its accompanying arm g^4 moved outward an envelope or card or whatever is in the receptacle will be forced out.

I will now describe the mechanism whereby the wheel carrying the card receptacles is revolved.

H is a plate which I may term a supporting plate, which is engaged in the back or under side of the globe at h and extends down into the upper end of the standard. It is again supported at h' where the globe joins the standard. This plate acts as a supporting plate for a considerable amount of the mechanism.

J is a shaft projecting through the face of the upper end of the standard where it is provided with a crank arm J′, the inner end being supported by the yoke h^2 on the plate H. Through this shaft the operative mechanism is driven. Keyed to this shaft (see Figs. 6 and 7) is a collar k carrying a ratchet wheel k'.

k^2 is a gear wheel loose on the shaft J and provided with a pawl k^3 which engages the ratchet wheel. Thus it will be seen that when the shaft is turned in the direction of the arrow, Fig. 6, it will pass the pawl and when revolved in the opposite direction the ratchet wheel will engage the pawl and revolve the gear k^2.

Meshing with the gear k^2 is a gear K which in turn meshes with a gear K′ the latter meshing with a gear K^2 on the shaft K^3. On the other end of this shaft is a gear K^4 which in turn meshes with the gear K^5 on the axle G of the wheel carrying the cards. Thus when the gear k^2 is revolved by means of the shaft J the receptacle wheel will be revolved. On the face of the upper end of the standard is a dial j such as shown in Fig. 12, having thereon the periods of the zodiac. Engaged to the hub of the gear k^2 is a sleeve k^4 surrounding the shaft J and extending out to the face of the standard where said dial j is provided. This dial j is divided into the periods of the zodiac and on the face of the standard surrounding this are two points represented by a star and crescent as shown in Fig. 5. Now as will be seen when the crank J′ is revolved in the direction of the arrows Fig. 12 the ratchet wheel k' engaging the pawl k^3 revolves the gear k^2 and this in turn revolves the dial j. Now by setting the dial j at the proper point with relation to the star or crescent the particular receptacle containing cards pertaining to that period of the zodiac set opposite of the star or crescent as the case may be, will be brought opposite the slot a. The card in the receptacle is thrown out by mechanism which I will presently describe.

I will now describe the spring mechanism whereby the bodies representing the planets are revolved.

M is a spring supported in a suitable pocket H′ on the plate H. One end of the spring is engaged to the pocket at m while the other end is engaged to a shaft M′. On this shaft M′ is an arm M^2 to which is engaged a cord M^3 which extends down over suitable pulleys to a drum M^4 on the shaft J (see Figs. 10 and 7). I will presently describe how the tension on this cord is created, it suffices at present to say that when the cord is pulled the arm M^2 is thrown down.

Keyed to the shaft M′ is a ratchet wheel M^5. Loose on this shaft is a gear M^6 provided with a pawl M^7 which engages the ratchet wheel. Thus when the shaft is turned in one direction by a pull upon the cord M^3 the ratchet wheel will pass readily under the pawl, but this pull on the cord winds up the spring M. Now, when tension on the cord is relieved, as will be hereinafter described the spring exerts its power upon the ratchet wheel M^5 and this, through the pawl M^7, revolves the gear M^6. This gear meshes with a small pinion M^8 and on the shaft M^9 of the pinion M^8 is another small pinion M^{10}. This pinion M^{10} meshes with the gear E^8. The gear E^8 meshing with the pinion F^8 revolves the latter and also the shaft to which the gears F′ to F^8 are all engaged. The result is that when the gear F^8 is revolved each of the gears E′ to E^8 are revolved, and consequently the bodies D′ to D^8 are revolved.

N is a coin chute extending from the coin opening N′ in the face of the standard down to the mechanism on the shaft J (see Figs. 3, 6 and 7). As before mentioned on the shaft J is a drum M^4. Engaged to or made a part of this drum is a coin receiving block O having a recess o in its face and another recess o'. Pivoted to the block k on the shaft J is a lever O′ (Figs. 6 and 7). As before explained the block k is keyed to the shaft J. Now when the shaft is revolved it carries the block k and consequently the lever O′ with

it. The tail of this lever passes through the slot o' in the coin receiving block O. If there is a coin there and the lever is turned in one direction the tail striking the coin will tilt the lever and it will readily pass the same being returned to its normal position by a spring o^2. If on the other hand it is turned in the position or in the direction of the arrow Fig. 6 and there is a coin in the block, the tail striking this coin and the opposite end bearing upon the block k, will carry the coin block and consequently the drum M^4 around with it. On the drum M^4 is the cord M^3 which extends up to the arm M^2 so that when the drum is revolved the cord and the arm M^2 are drawn down and the spring wound up as hereinbefore explained. The shaft J is revolved around (see Fig. 3) until the coin receptacle reaches a stationary arm O^3 bent to cam shape (see Fig. 8), this arm striking the coin forces it out through the bottom of the coin receptacle and it drops through the opening O^4 to a suitable receptacle beneath.

As will be seen by reference to Fig. 7 the drum M^4 has a smaller diameter and to this is engaged the cord P. This cord extends over suitable pulleys p, p' up to a yoke P' which slides on suitable supporting rods P^2 (see Figs. 2 and 3). On this yoke is a projection P^3 having a V shaped face and this projection engages with a corresponding projection G^8 on the plate g' of each receptacle G^2. Thus when a tension or pull is exerted on the cord P it pulls down the yoke P' and the latter engaging the projection G^8 forces the plate outward or toward the periphery and the projection g^6 on the arm g^4 striking the top card forces it out through the slot a'. As soon as the coin is forced out of the coin receptacle the tension on the cord P is released and the spring p^2 instantly returns the yoke to its normal position. Thus we see that when a coin is in the coin receptacle and the shaft is revolved in the direction of the arrow on the dial Fig. 5 or in the direction of the arrow Fig. 6 the spring M is wound up and a card is forced out through the slot a'.

When the coin is forced out of the receptacle by the arm O^3 the tension on the cord M^3 is relieved and the spring M can exert its force to revolve the bodies. It is of course obvious that when there is no coin in the block O the tail of the lever O' will pass freely through the slot o' and the drum M^4 will not be revolved. To prevent the coin when it drops down through the chute and into the coin block from passing through the coin block the supporting plate H is extended under the coin block so that the coin coming down rests on this plate until the drum M^4 has been revolved when the coin passes off from this plate and is struck by the arm O^3.

On the face of the globe is a suitable glass or lens Q and in order that the interior of the globe cannot be inspected except when a coin is placed in the machine I provide a curtain Q'. This curtain is mounted upon rods Q^2, Q^3. The rod Q^2 extending down where it is pivoted in the main partition B and the rod Q^3 being pivoted in said partition by the slot q surrounding the pivot q'. The rod Q^3 is flattened at this point and extends on down where it is pivoted at q^2 to another portion Q^4, the latter being pivoted to a stationary piece Q^5 at q^3. This piece Q^4 follows the curve of the globe until it reaches a point adjacent to the arm m' on the arm M^2. On this arm m' (to which the cord M^3 is directly engaged) is a projection or hook m^2. When the cord M^3 is pulled this hook engages the piece Q^4 and carries it with it. This throws the pieces Q^4 Q^3 to the position shown in dotted lines Fig. 11 and carries the curtain Q' away from the glass or lens Q. As the arm m' is pulled still farther downward the end of the piece Q^4 rides over the stationary projection Q^6 and is held there. As the arm M^2 and its cross arm m' return to their normal position the end of the piece Q^4 will be held by the projection Q^6 until a cam Q^7 on the arm m' rides against the piece Q^4 and lifts it off from the projection Q^6 when the spring Q^8 will return the curtain to its normal position obscuring the lens or opening.

The operation of the machine is as follows: The crank J is grasped and revolved in the direction shown by the arrow in Fig. 12. This brings that period on the dial representing that period of the zodiac within which the person was born opposite its particular point on the case. For instance if a man were born in January on or before the 22d, he would set it at the notch provided on the dial for that period of the zodiac and at the crescent on the case, while if he were born after the 22d of January, but during January, he would set it at the star on the case. The revolution of the shaft would cause the ratchet wheel k' to engage the pawl k^3 on the gear k^2 and would through the gears K, K', K^2 and K^3, gear K^4 and gear K^5, which is on the shaft G of the wheel, revolve the wheel carrying the receptacles and bring that receptacle having cards corresponding with the period of the zodiac to which the dial is set, opposite the slot a'. The coin is now dropped in the opening N', passes down through the chute N and enters the coin receptacle block O. The crank is now turned in the direction of the arrow Fig. 5. The ratchet k' readily slips past the pawl k^3 and consequently the gear k^2, dial j and wheel G are not disturbed. This revolution of the shaft or crank in the direction of the arrow Fig. 5 revolves the block k carrying the lever O' and brings the tail of the lever O' against the coin in the block. A continued revolution revolves the block and consequently the drum M^4. This revolution of the drum M^4 winds up the cords M^3 and P. This cord M^3 being wound up throws down the arm M^2, winds up the spring M and moves the piece Q^4 to throw the curtain back from the lens or glass Q. The coin then obviously reaches the arm O^3 and is forced out of the

coin slot. This releases the spring M and through the gear M^8, shaft M^9 and gear M^{10} the gears F′ to F^8 and consequently the bodies D′ to D^8 are revolved. The tension on the cord P has pulled down the yoke P′ until the V shaped projection on the yoke engages the corresponding projection on the plate thus locking the wheel against any revolution. A further pull on the cord P forces out one of the cards. After the bodies have revolved a sufficient time to bring the cam Q^7 against the piece Q^4 the latter is disengaged and the curtain returns to its normal position. To regulate the speed of the bodies D′ to D^8 I introduce a train of gears shown in Fig. 10. The gear R is on the shaft with the pinion M^8. This gear meshes with a pinion R′ on the same shaft R^2. The latter meshes with a pinion R^3. On the shaft of this pinion is a fan R^4. On the same shaft is a pinion R^5 which meshes with a pinion R^6 the shaft of which carries a pinion R^7 which meshes with a pinion R^8. On this shaft is another fan R^9. The speed of the bodies is thus governed and can be regulated to any extent desired.

What I claim is—

1. In a coin controlled mechanism, the combination of a hollow globe provided with means for inspecting the interior thereof, of a series of spherical bodies within said globe representing the sun and planets, means for revolving the planets around the sun and means for revolving the sun on its own axis, a curtain for obscuring the means for inspecting the interior of the globe and coin controlled mechanism governing the withdrawal of said curtain whereby the curtain may be withdrawn upon the insertion of a predetermined coin, substantially as described.

2. In a coin controlled mechanism, the combination of a hollow globe provided with means for inspecting the interior thereof, a series of bodies within said globe representing the sun and planets, means for revolving the planets around the sun, a series of receptacles containing cards or the like, and coin controlled mechanism governing the revolution of the planets, and the discharge of cards from the receptacle, substantially as described.

3. In a coin controlled mechanism, the combination of a hollow globe provided with means for inspecting the interior, of a series of bodies representing the planets and the sun, a curtain for obscuring the means for inspecting the interior thereof, a series of receptacles containing cards; and coin controlled mechanism governing the withdrawal of said curtain, also the discharge of cards from the receptacles, substantially as described.

4. In a coin controlled mechanism the combination of a hollow globe containing a series of bodies revolving at different speeds and provided with means for inspecting the interior thereof, of a curtain for obscuring said means, a shaft for moving said curtain to withdraw it, a flexible connection between the shaft and curtain, and coin controlled mechanism governing the connection between the shaft and flexible connection, substantially as described.

5. In a coin controlled mechanism, the combination of a hollow globe provided with means for inspecting the interior thereof, a series of bodies representing the sun and planets, means for revolving said planets around the sun, a series of receptacles containing cards, means for revolving the same within the globe, a curtain for obscuring the means for inspecting the interior of the globe and coin controlled mechanism governing the withdrawal of said curtain, governing the revolution of said bodies and governing the discharge of cards from the receptacles, substantially as described.

6. In a coin controlled mechanism, the combination of a series of bodies representing the sun and planets, a spring for revolving the same a series of graduated gears, there being two for each body, between the spring and bodies to give the bodies a different speed and coin controlled mechanism for governing the action of said spring to revolve the planets, substantially as described.

7. In a coin controlled mechanism, the combination of a series of bodies representing the sun and planets, a spring for revolving the same, a shaft for winding the spring and coin controlled mechanism for releasing the spring a series of graduated gears, there being two for each body, between the spring and bodies to give the bodies a different speed and allow the same to revolve the planets, substantially as described.

8. In a coin controlled mechanism, the combination of a series of bodies representing the sun and planets, a spring for revolving the planets around the sun a series of receptacles containing cards, means for delivering a card from a particular receptacle, means for revolving said receptacles to bring the desired receptacle opposite the delivery mechanism, and coin controlled mechanism governing the action of the spring to revolve the planets and governing also the delivery mechanism, substantially as described.

9. In a coin controlled mechanism, the combination of a hollow globe provided with means for inspecting the interior thereof, a curtain for obscuring the same a series of bodies representing the sun and planets, a spring for revolving the planets around the sun, a series of receptacles containing cards, delivery mechanism adapted to engage and deliver a card, means for revolving a particular receptacle to a point opposite the delivery mechanism, and coin controlled mechanism governing the action of the said spring for revolving the planets, governing the curtain, and governing the delivery mechanism, substantially as described.

10. In a coin controlled mechanism, the combination of a series of bodies representing the

sun and planets, means for revolving said planets, coin controlled mechanism governing the action of said revolving means, and a series of gears between the planets and the revolving mechanism, each particular planet having a different sized set of gears whereby each planet is given a different speed in its revolution, substantially as described.

11. In a coin controlled mechanism, the combination of a series of bodies representing the sun and planets mounted upon suitable revolving mechanism, a spring for revolving the planets around the sun, coin controlled mechanism governing the spring, a series of gears of graduated sizes between the spring and planets whereby each planet is given a different speed, substantially as described.

12. In a coin controlled mechanism, the combination of a series of bodies representing the sun and planets, means for revolving the planets around the sun, a series of receptacles containing cards, delivery mechanism for delivering a card, and a shaft connected with the wheel carrying the receptacles and adapted when revolved in one direction to revolve said receptacles, coin controlled mechanism engaged also to said shaft, said shaft when revolved in the opposite direction adapted when a coin is in the coin controlled mechanism to operate the latter and thus release the means for revolving the planets and also operate the delivery mechanism, substantially as described.

13. In a coin controlled mechanism, the combination of a hollow globe containing a series of bodies revolving at different speeds and provided with means for inspecting the interior and provided with a curtain for obscuring said means, of a shaft extending to the exterior of the case and there provided with means for revolving it by hand, coin controlled mechanism engaged to said shaft and adapted when a predetermined coin is inserted and the shaft revolved to operate said curtain, substantially as described.

14. In a coin controlled mechanism, the combination of a series of receptacles each having a slot in its face and each containing a series of cards, of a movable arm in each receptacle adapted to engage the top card in that receptacle, delivery mechanism, means for revolving the receptacles to bring the desired receptacle opposite the delivery mechanism and coin controlled mechanism governing the operation of the delivery mechanism, substantially as described.

15. In a coin controlled mechanism, the combination of a wheel containing a series of receptacles, a shaft connected by intermediate gears with the wheel for revolving the same, delivery mechanism connected with said shaft, coin controlled mechanism between the delivery mechanism and the shaft whereby when the shaft is turned in the opposite direction from that employed to revolve the wheel and a predetermined coin is inserted in the coin controlled mechanism the delivery mechanism will be operated, substantially as described.

16. In a coin controlled mechanism the combination of a series of bodies representing the sun and planets, a spring for revolving the planets around the sun, a cord connected with said spring for exerting a tension thereon, a shaft adapted to be revolved by hand and coin controlled mechanism connecting the shaft and cord whereby when a predetermined coin is inserted the shaft and cord are connected so that when the shaft is revolved the spring will be wound up, substantially as described.

17. In a coin controlled mechanism the combination of a series of bodies representing the sun and planets, a spring for revolving the planets around the sun, a cord connected with said spring for exerting a tension thereon, a shaft adapted to be revolved by hand, coin controlled mechanism connecting the shaft and cord whereby when a predetermined coin is inserted the shaft and cord are connected, and means for removing the coin from the coin controlled mechanism thereby releasing the spring and allowing it to revolve the planets, substantially as described.

18. In a coin controlled mechanism, the combination with a hollow globe provided with means for inspecting the interior thereof, of a curtain for obscuring the same, a series of bodies representing the sun and planets, means for revolving the planets around the sun, coin controlled mechanism governing the action of said revolving means and also the withdrawal of the curtain, means for holding the curtain withdrawn and means connected with the planet revolving mechanism for releasing said curtain and allowing it to return to its normal position, substantially as described.

19. In a coin controlled mechanism, the combination of a hollow globe provided with means for inspecting the interior thereof, of a curtain for obscuring the said means, a series of bodies representing the sun and planets, a spring for revolving the planets around the sun, coin controlled mechanism governing the action of the spring said coin controlled mechanism governing also the withdrawal of the curtain, a catch for engaging the curtain to hold it withdrawn and means connected with the planet revolving spring for releasing the curtain and allowing it to return to its normal position, after the planets have revolved a predetermined length of time, substantially as described.

20. In a coin controlled mechanism, the combination with a series of receptacles containing cards, of a dial divided into sections corresponding with the number of receptacles, each of the latter provided with cards and each provided with a delivery arm, delivery mechanism adapted to eject one of the cards and coin controlled mechanism for governing

the delivery mechanism, substantially as described.

21. In a coin controlled mechanism, the combination with a wheel carrying a series of receptacles, a dial divided into the periods of the zodiac, there being one receptacle for each period, said receptacles containing cards and each having a delivery arm, delivery mechanism for delivering a card and coin controlled mechanism governing the delivery, substantially as described.

22. In a coin controlled mechanism, the combination of a wheel carrying a series of receptacles, each receptacle carrying discharge mechanism, delivery mechanism adapted to engage the discharge mechanism, coin controlled mechanism governing the delivery mechanism, said delivery mechanism provided with means to engage the wheel and prevent it from revolving during the delivery, substantially as described.

23. In a coin controlled mechanism, the combination of a wheel carrying a series of receptacles, discharge mechanism carried by each receptacle, stationary delivery mechanism, coin controlled mechanism governing the action of the delivery mechanism and a V shaped projection on the delivery mechanism adapted to engage a corresponding projection on the discharge mechanism, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

JAMES M. SULLIVAN.

Witnesses:
W. H. CHAMBERLIN,
BENJA. WOLHAUPTER.