(No Model.) 8 Sheets—Sheet 1.

B. GREEN.

COIN OPERATED SIGHT TESTING APPARATUS.

No. 525,652. Patented Sept. 4, 1894.

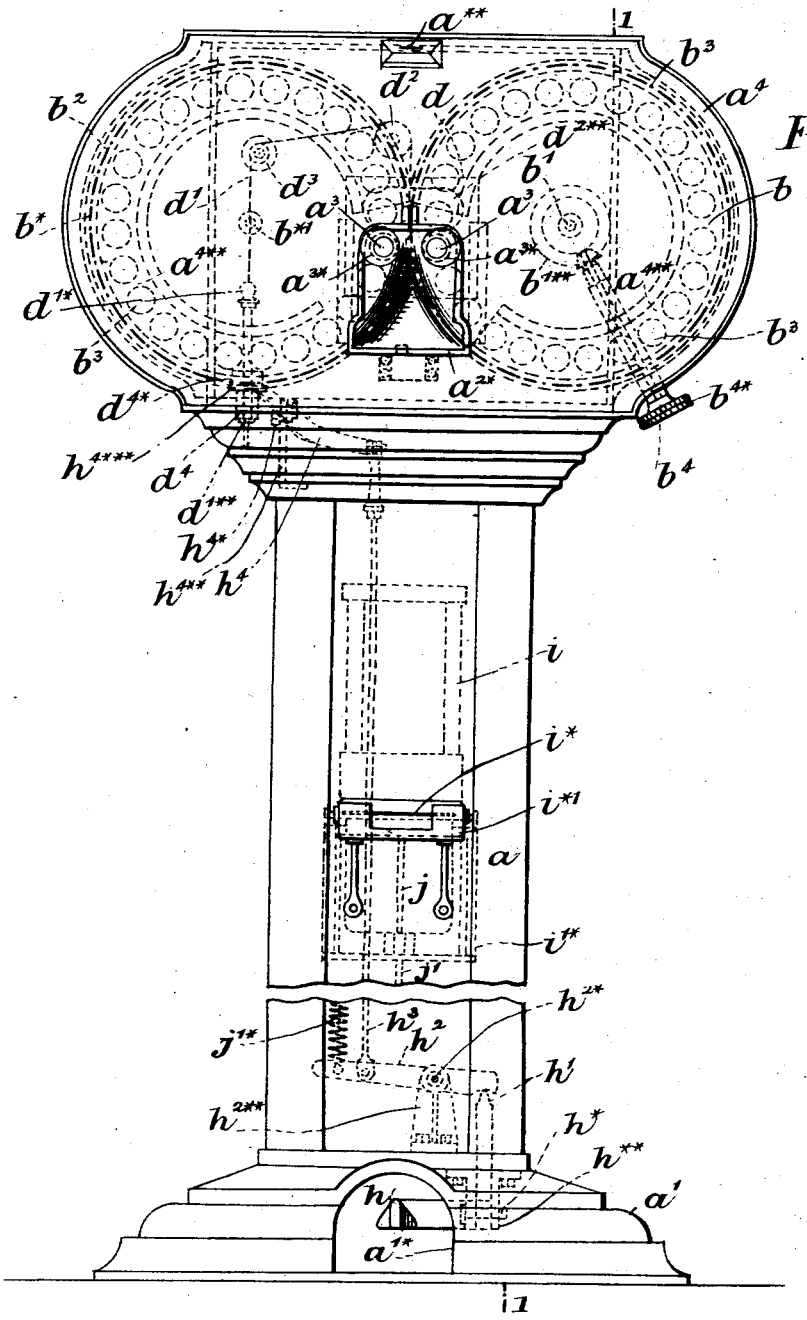

Fig. 1

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COIN OPERATED SIGHT TESTING APPARATUS.

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Fig: 2

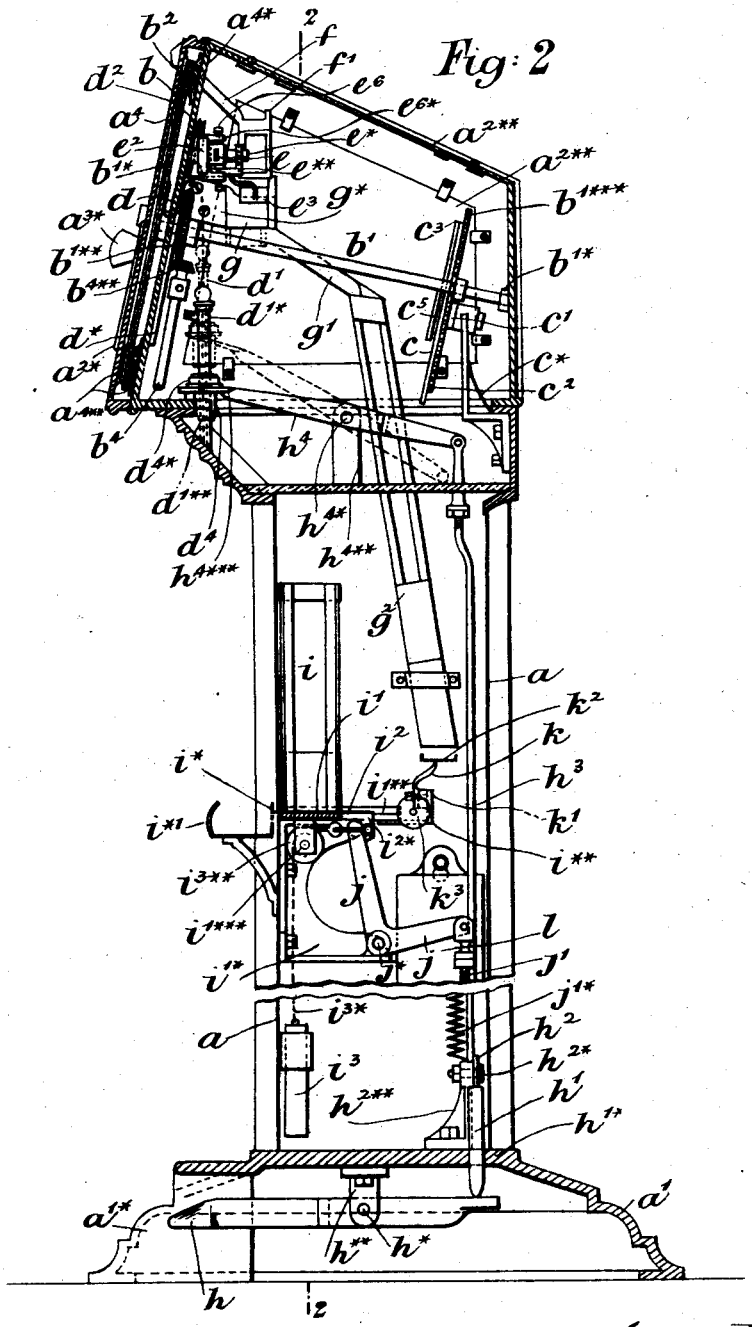

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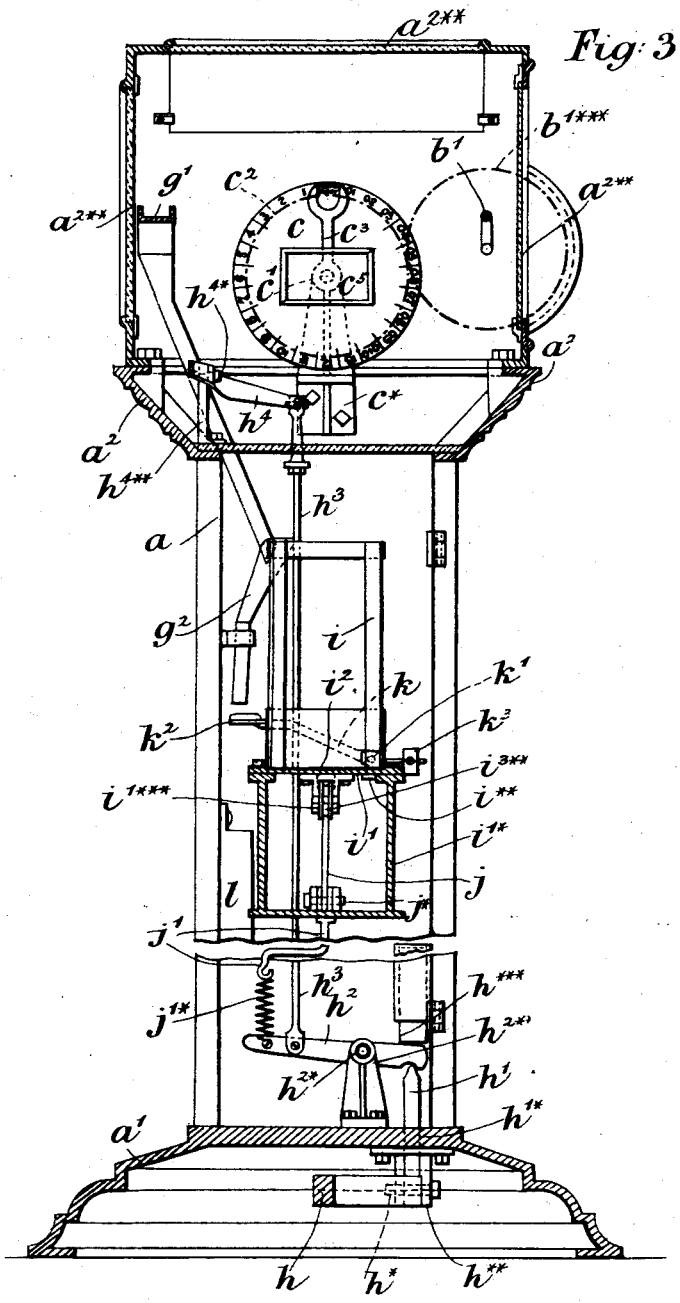
Fig. 3.



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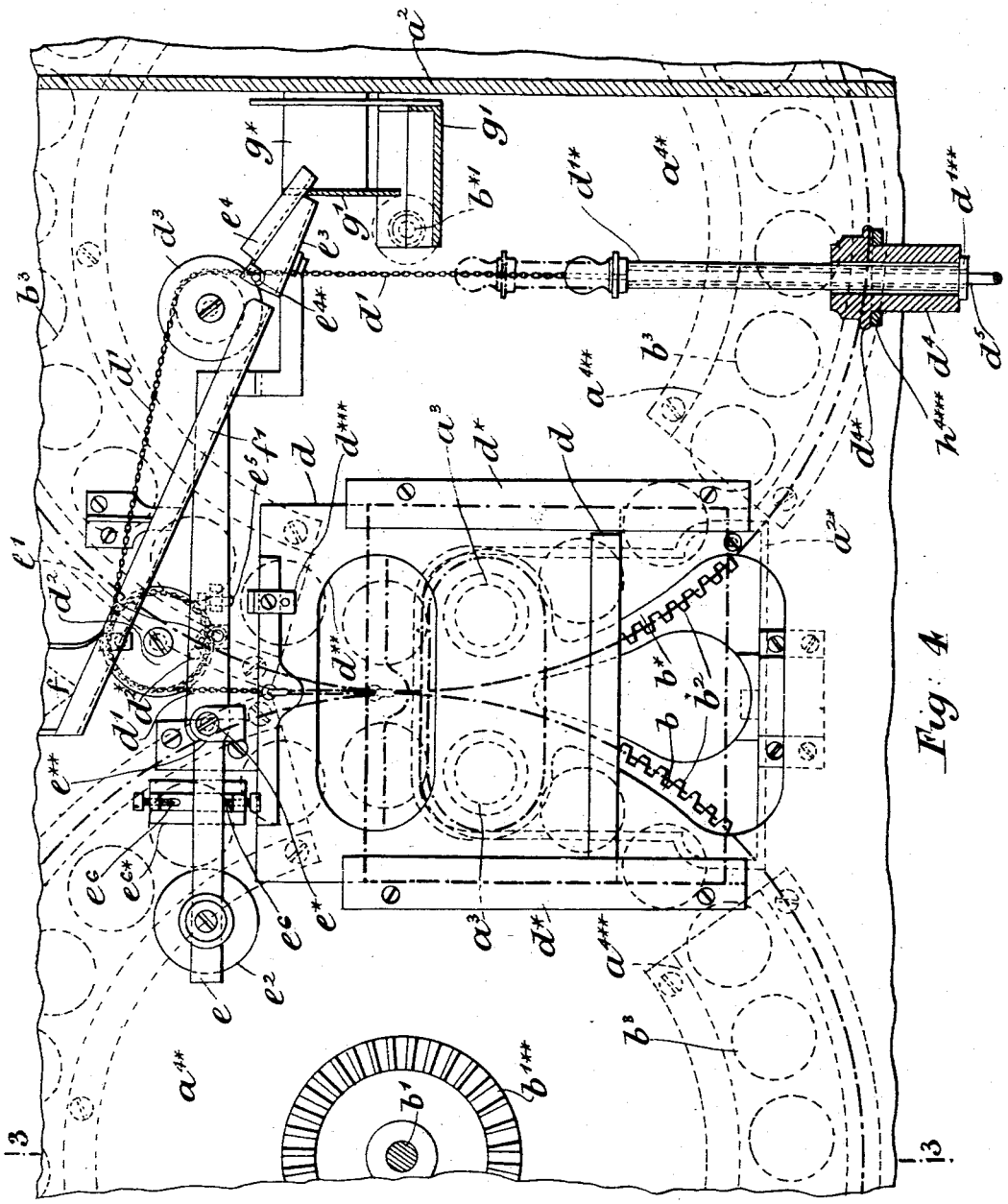

Fig. 4

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Fig. 5.

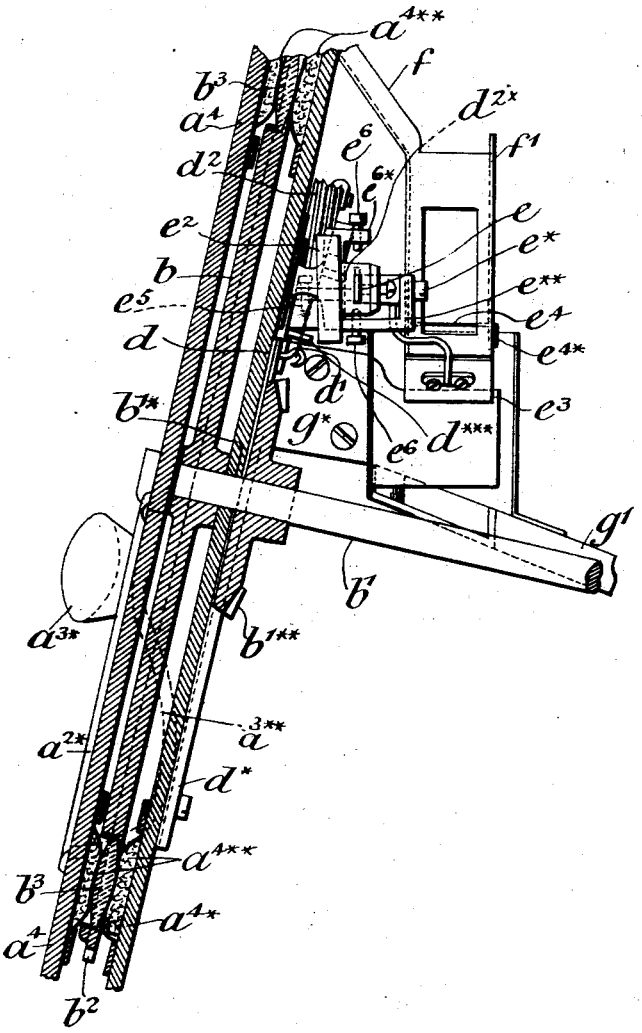

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Fig. 6.

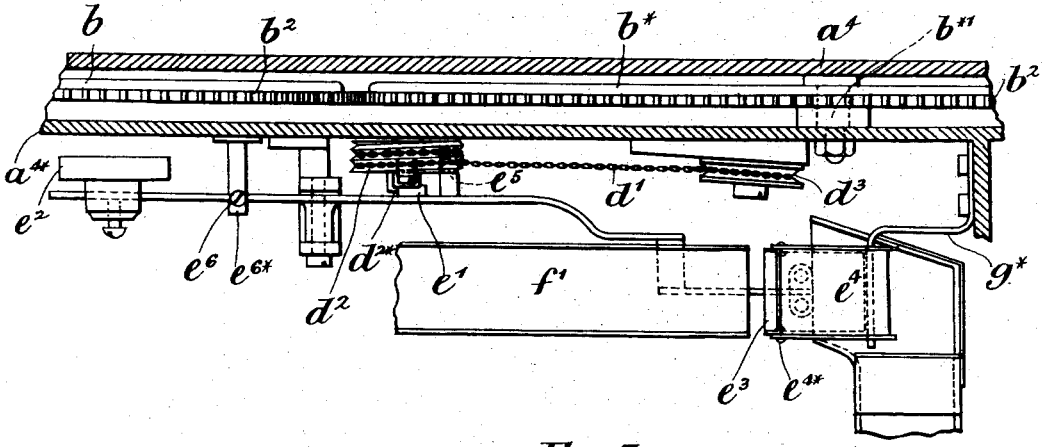
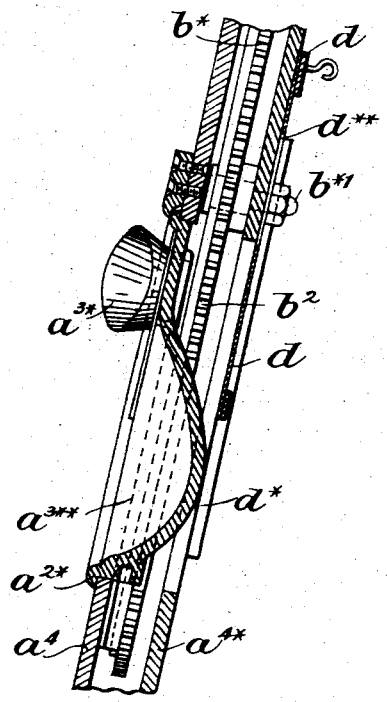


Fig. 7.



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COIN OPERATED SIGHT TESTING APPARATUS.

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Fig. 8

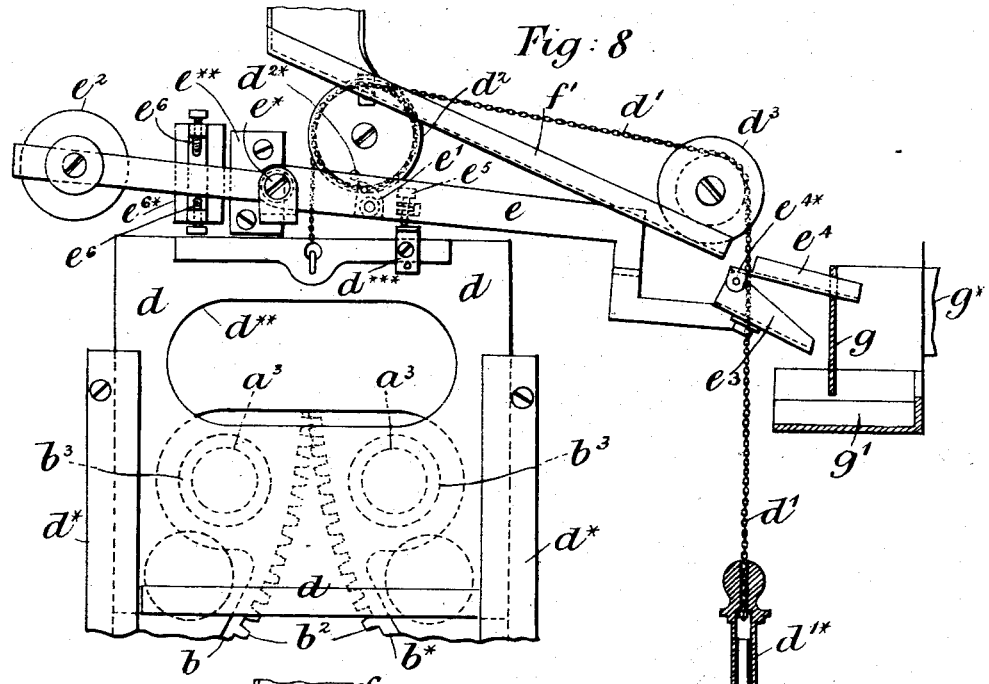
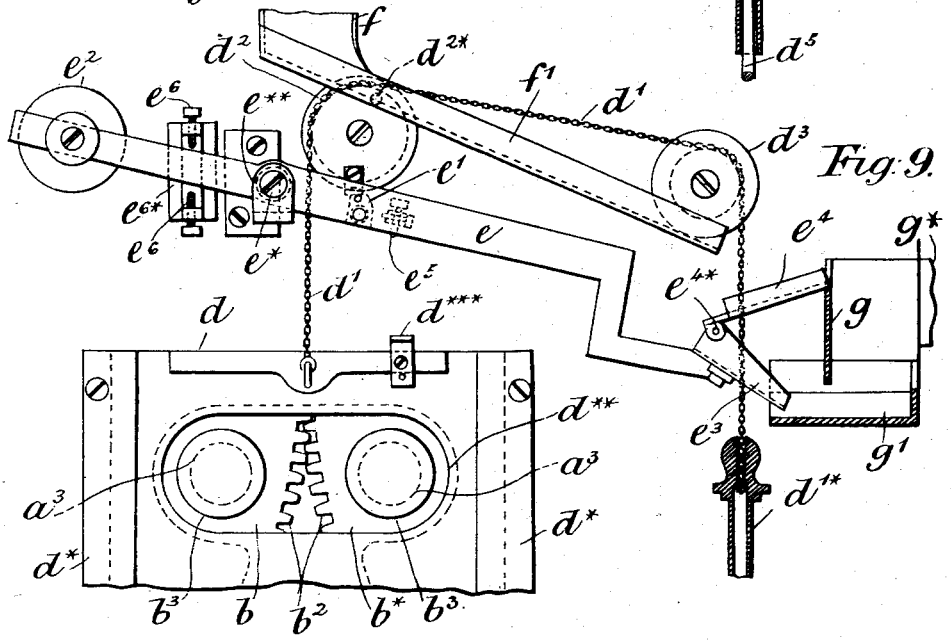


Fig. 9.



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COIN OPERATED SIGHT TESTING APPARATUS.

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Fig. 11

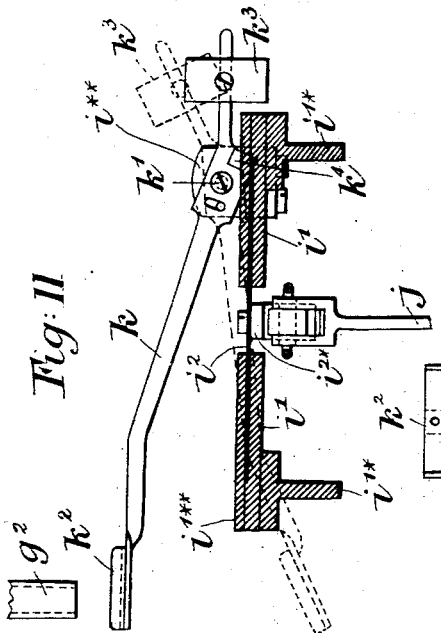


Fig. 12

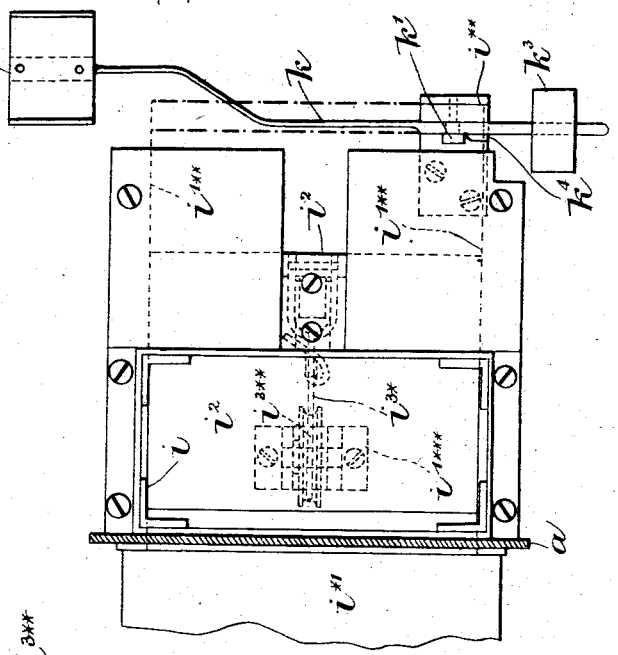
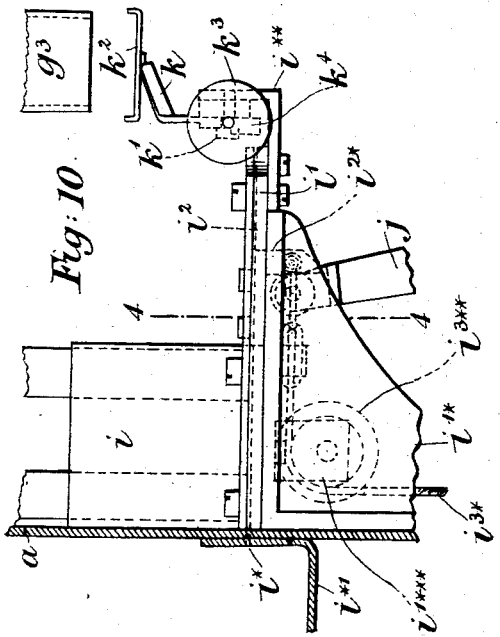


Fig. 10



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UNITED STATES PATENT OFFICE.

BRUCE GREEN, OF LONDON, ENGLAND.

COIN-OPERATED SIGHT-TESTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 525,652, dated September 4, 1894.

Application filed August 15, 1892. Serial No. 443,138. (No model.) Patented in France February 23, 1889, No. 196,264; in Germany February 24, 1889, No. 49,577; in Belgium March 9, 1889, No. 85,327; in England March 1, 1892, No. 3,967; in Norway July 4, 1892, No. 2,982; in Sweden July 4, 1892, No. 4,299; in Switzerland July 29, 1892, No. 5,661; in Victoria August 2, 1892, No. 9,838; in Cape Colony August 4, 1892, No. 778; in Spain August 5, 1892, No. 13,545; in New Zealand August 15, 1892, No. 5,723; in Western Australia August 17, 1892, No. 360; in New South Wales August 29, 1892, No. 3,945; in Italy August 29, 1892, XXVI, 32,573, LXIV, 65; in Queensland October 4, 1892, No. 2,183; in Canada November 2, 1892, No. 40,821; in India, 1892, No. 216, and in Austria-Hungary April 13, 1893, No. 50,617 and No. 1,683.

To all whom it may concern:

Be it known that I, BRUCE GREEN, gentleman, a subject of the Queen of Great Britain, residing at No. 57 Chancery Lane, London, in the county of Middlesex, England, have invented certain new and useful Improvements in or Connected with Coin-Freed or Coin-Operated Sight-Testing Apparatus, (for which I have obtained Letters Patent in Great Britain, Patent No. 3,967, dated March 1, 1892; in France, patent of addition, dated June 25, 1892, to Patent No. 196,264, dated February 23, 1889; in Belgium, patent of addition, No. 100,300, dated June 27, 1892, to Patent No. 85,327, dated March 9, 1889; in Spain, Patent No. 13,545, dated August 5, 1892; in Germany, patent of addition, dated July 2, 1892, No. 66,959, to Patent No. 49,577, dated February 24, 1889; in Norway, Patent No. 2,982, dated July 4, 1892; in Sweden, Patent No. 4,299, dated July 4, 1892; in Austria-Hungary, Patent No. 50,617 and No. 1,683, dated April 13, 1893; in Victoria, Patent No. 9,838, dated August 2, 1892; in New Zealand, Patent No. 5,723, dated August 15, 1892; in Western Australia, Patent No. 360, dated August 17, 1892; in New South Wales, Patent No. 3,945, dated August 29, 1892; in Queensland, Patent No. 2,183, dated October 4, 1892; in Cape Colony, Patent No. 778, dated August 4, 1892; in Switzerland, Patent (provisional) No. 5,661, dated July 29, 1892; in India, Patent No. 216 of 1892; in Italy, patent dated August 29, 1892, Vol. XXVI, No. 32,573, LXIV, No. 65, and in Canada, Patent No. 40,821, dated November 2, 1892,) of which the following is a specification.

This invention relates to improvements in or connected with coin-freed or coin-operated sight-testing apparatus, whereby a person may, in exchange for a deposited coin of a given denomination or predetermined character, have access to the apparatus, by the aid of which he can test the strength of his sight, and ascertain the power of the glasses or lenses best suited thereto, and the invention has for its object to improve various details of construction of such apparatus. For this purpose I employ a suitable case, the lower part of which is spread out in the form of a foot or base, and the upper part is enlarged to accommodate the lenses and apparatus hereinafter more fully described.

Within the upper part of the case are arranged two disks provided with teeth upon their peripheries, by means of which teeth they are geared together, and each of these disks is fitted with glasses or lenses of varying power, arranged in the same order, which glasses or lenses are employed for ascertaining the strength of the sight. These disks are capable of being revolved upon their axes by means of a milled wheel arranged upon the exterior of the case, which wheel, through a shaft and beveled pinion, is geared with a beveled toothed wheel upon the shaft or axis of one of the disks, so that the disks may be revolved, bringing successively each pair of lenses into the line of sight, until one of a strength suitable to the eyesight of the person operating the machine arrives in position.

The front of the upper part of the case is furnished with a locked door, in which are provided two apertures or eye-holes or orifices, fitted with eye-pieces, preferably closed by disks of plain glass, through which a person operating the apparatus is required to look, and, in order to facilitate this operation, a recess is provided beneath the eye-pieces to accommodate the nose and lower part of the face of the operator.

As the disks are revolved, each pair of glasses or lenses is brought into position for use opposite the eye-pieces in the front of the case, and the strength of each pair of glasses or lenses, as it arrives in such position, is indicated by a number or symbol upon a disk located at the back of the apparatus within the line of sight, and caused to revolve together with one of the disks by means of suitable gearing, and attention is directed to the indicating number or symbol by means of a fork or frame through which the indicating

number must be viewed, or the said fork may be dispensed with and the indicating disk covered by a fixed disk, through an aperture in which the number or symbol, indicating the strength of the pair of glasses or lenses, would be visible.

At the rear and front of each disk, and respectively upon the transverse wall or partition and upon the front wall of the case, are pads arranged in the arc of a circle, which pads are constantly in contact with the lenses or glasses and have for their object to cleanse the surfaces of the lenses during the revolution of the disks.

Ground glass windows are provided at the upper part of the case in order to admit light to the interior of the apparatus during the day, while, at night, the interior of the case is illuminated by an artificial light which may be arranged above or in close proximity to that part of the case.

In order to prevent the use of the apparatus until a coin of predetermined kind has been inserted therein, a vertically sliding shutter is employed to normally cover the eye-openings in the front wall of the case and obstruct the line of sight, and this shutter is suspended from a chain which passes around a spirally grooved wheel mounted upon an axis of motion carried by the case of the instrument and thence passes around a guide pulley to a weight which normally holds the shutter in its raised or closed position, but is capable of being raised to allow of the shutter descending to open the eye apertures, as hereinafter more fully described.

The weight device consists of a tubular spindle guided by a fixed rod, and provided at its lower end with an enlargement upon which a loose weight normally rests with capability of being raised by the treadle lever, hereinafter referred to, without injury to the apparatus.

The spirally grooved wheel has fixed thereon a pin or stud which is normally engaged by a tooth or projection upon a weighing beam or lever, which is mounted upon an axis of motion and is counterbalanced by an adjustable counter-weight, in such manner, that a coin of the prescribed kind, inserted into the machine, will depress one end thereof and withdraw the tooth from the stud of the spiral wheel, thus permitting the wheel to revolve and lower the shutter.

The coin is conducted into an open ended pocket, carried by the weighing beam, by means of an inclined upper chute or guide leading from the usual money slot in the front of the machine, and the pocket is so arranged that its lower end normally bears against, or is in near contact with, a fixed plate so that the coin cannot be discharged therefrom until the shutter has been properly released, as hereinafter described, when the mouth of the pocket will descend below the fixed plate and allow the coin to be discharged into a lower money chute by which it is conducted, as hereinafter described, to a card delivering apparatus.

In order to prevent a second coin, inserted into the instrument while the money pocket and weighing beam are partially depressed, from blocking the machine, a guide is hinged to the upper part of the pocket by its upper end, and, at its lower end, extends over or through the fixed plate so as to conduct the coin into the lower money chute, and, by the depression of the pocket and weighing beam, is brought into alignment with the upper money chute, conducting the coin from the money slot, so that if a coin, at that time, be inserted it will be conducted by the guide into the lower money chute.

The weighing beam is prevented from being fully depressed and discharging the coin into the lower money chute until the shutter is lowered to give access to the machine, by means of a stop, formed by a bracket from the shutter, which engages a set screw carried by the weighing beam, and prevents the descent thereof sufficiently to discharge the coin into the lower money chute until the shutter has been lowered, when the weighing beam will descend to the extremity of its traverse and discharge the coin from the pocket into the lower money chute, while the extreme movements of the weighing beam are regulated by means of set screws.

The weight is raised and the shutter lowered by a person operating the machine, after the insertion of the prescribed coin, as hereinbefore described, by means of a pedal lever or foot plate located at the base of the machine and mounted upon a center of motion, which foot plate at its inner end acts upon a vertical pin or bolt mounted loosely in a guide and resting upon the pedal lever, which pin or bolt at its upper end acts upon one end of a rocking lever, the other end of which is, by a connecting rod, connected with one end of another rocking lever located at the upper part of the machine and provided at its opposite end with a fork which acts upon an enlargement of the weight attached to the shutter chain, and the shutter is thus lowered by pressure applied to the pedal lever or foot plate.

The outer end or foot plate of the pedal lever is formed with inclined sides in order to prevent a second person placing his foot thereon so as to hold the pedal lever depressed and thus obtain the use of the apparatus without inserting a second coin.

In order to deliver to a person operating the machine a card upon which he may make a note of the indicated number of the glasses suited to his sight, the following means are employed:

At the front of the machine, is arranged an issuing orifice for the cards, beneath which orifice is provided a tray or receiver for the cards, and within the case of the machine above the issuing orifice is a tubular or skeleton reservoir in which the cards are piled in

a column, as is well understood, and rest upon a table located upon a level with the lower side of the issuing orifice.

Sliding in or upon guides, arranged upon a level with the table, is a pusher which is drawn forward to deliver a card by means of a weight connected therewith by a chain passing over a guide pulley, and which is retracted in readiness for the forward movement, upon pressure being applied to the pedal lever, by means of a bell crank lever, one arm of which bears against a projection from the pusher, and the other arm of which is pin-jointed to a connecting rod which is, by means of an interposed coil spring, connected with one end of the lower rocking lever, so that pressure applied to the pedal lever will cause the retraction of the pusher.

The full retraction of the pusher, that is to say, the retraction of the pusher, the distance necessary to enable it in its forward movement to push out one of the cards of the column, is prevented, until a coin has been inserted into the machine, by means of the following device.

Near the termination of the backward traverse of the pusher, is arranged a stop lever, which is mounted upon an axis of motion, and arranged transversely of the path of the pusher, and this stop lever, which is at one end provided with a tray, and at the other end is counterbalanced by means of an adjustable weight, is provided with a tooth or projection, which normally obstructs the backward movement of the pusher, but is adapted to be moved out of the way to allow of the full retraction thereof, by means of the coin (after it is discharged from the coin-operating mechanism of the shutter) falling upon the tray, and thus momentarily raising the tooth or projection clear of the path of the pusher, the spring connection between the lower rocking lever and the bell crank lever, which upon the depression of the pedal lever exerts a constant force upon the pusher, immediately retracting the pusher to the extremity of its traverse.

In order that the said invention may be more clearly understood and readily carried into effect, I will proceed, aided by the accompanying drawings, more fully to describe the same.

Figure 1 is a front elevation of an apparatus constructed according to my invention. Fig. 2 is an irregular vertical transverse section taken on the line 1—1 of Fig. 1. Fig. 3 is a vertical longitudinal section taken on the line 2—2 of Fig. 2. Fig. 4 is a rear elevation, partly in section, representing a portion of the front of the apparatus and connected parts. Fig. 5 is a transverse section thereof taken on the line 3—3 of Fig. 4. Fig. 6 is a sectional plan of a portion thereof. Fig. 7 is a transverse section of the center portion of Fig. 4, showing more particularly the arrangement of the shutter with relation to the eye-pieces, and the recess in the front of the case to accommodate the nose and lower part of the face of the person operating the machine. Fig. 8 is a rear elevation of a portion of the apparatus, showing more particularly the coin-operating mechanism for freeing the shutter, the weighing beam being partially depressed with the shutter in its normal position. Fig. 9 is a similar view, but showing the weighing beam fully depressed, and the shutter lowered to uncover the eye-pieces. Fig. 10 is a side elevation partly in section of a portion of the apparatus, showing more particularly the coin-operated mechanism for delivering a card to a person operating the machine. Fig. 11 is a transverse section thereof taken on the line 4—4 of Fig. 10, and Fig. 12 is a plan thereof.

In the several figures, in which like parts are indicated by similar letters of reference, Figs. 4 to 12 are drawn to an enlarged scale for the sake of clearness.

a represents the case of the machine, the lower part a' of which is spread out in the form of a foot or base, and the upper part a^2 of which is enlarged to accommodate the lenses and apparatus hereinafter more fully described.

Within the upper part a^2 of the case a are arranged two disks b b^*, one b of which is fixed upon a spindle b' extending from front to back of the upper part a^2 of the case a, and at each end thereof mounted in bearings b'^*, while the other disk b^* is mounted upon a short stud or axis $b^{*\prime}$ fixed to the front of the upper part a^2 of the case a, and these disks b b^* are provided with teeth b^2 upon their peripheries, by means of which they are geared together, so as to work in unison. Each of these disks b b^* is fitted with a circle of glasses or lenses b^3, each circle being composed of lenses of varying power, while the disks b b^* are so arranged with relation to each other that the lenses are successively brought in pairs into a convenient position for use in order to ascertain the strength of the sight.

The disks b b^* are adapted to be revolved upon their axes b' $b^{*\prime}$ by means of a milled wheel b^{4*} located upon the exterior of the upper part a^2 of the case a, and which is fixed upon a shaft or spindle b^4 mounted in suitable bearings and provided at its end with a beveled pinion b^{4**} which gears with a beveled toothed wheel b'^{**} fixed upon the shaft or spindle b' of the disk b, so that the disks b b^* may be revolved, bringing successively each pair of lenses b^3 into the line of sight until one of a strength suitable to the eye-sight of a person operating the machine arrives in position.

The front wall a^4 of the upper part a^2 of the case a is furnished with a locked door a^{3*}, in which are provided two apertures or eye-holes a^3 fitted with eye-pieces a^{3*}, preferably closed by disks of plain glass, through which a person operating the apparatus is required to look, and, in order to facilitate

this operation, a recess a^{3**} is provided beneath the eye-pieces to accommodate the nose and lower part of the face of the operator, and an opening is provided in the partition a^{4*}, hereinafter referred to.

As the disks b b^* are revolved and each pair of glasses or lenses b^3 is brought into position for use in alignment with the eye-pieces a^{3*} in the front of the case, the strength of each pair of glasses or lenses b^3 as it arrives in such position, is indicated by a number or symbol upon a disk c, mounted with capability of revolution upon an axis c' carried by a bracket c^* from the case a and provided with a circle of figures or symbols corresponding with the circles of lenses b^3 upon the disks b b^*, and this disk c is rotated in unison with the disks b b^* by means of a toothed wheel b'^{***} fixed upon the shaft or spindle b' which gears with a corresponding toothed wheel c^2 fixed upon the back of the disk c, while, in order to direct attention to the indicating number or symbol corresponding with the particular pair of lenses b^3 which is in alignment with the eye-pieces a^{3*}, a fork or frame c^3 is employed through which the indicating number must be viewed.

Carried by the axis of the disk c, and in front thereof is a fixed tablet c^5 upon which the necessary instructions (which constitute the test object) to a person using the apparatus, are inscribed.

At the rear and front of each disk b b^* and respectively upon a wall or partition a^{4*} and the front wall a^4 of the upper part a^2 of the case a are arranged in the arc of a circle pads a^{4**} which are constantly in contact with the lenses or glasses b^3 and have for their object, in the revolution of the disks b b^*, to cleanse the surfaces of the lenses b^3.

Ground glass windows a^{2**} are provided at the upper part of the case a in order to admit light to the interior of that part of the apparatus during the day, while, at night, the interior of the case is illuminated by an artificial light (not shown) which may be arranged above or in close proximity to that part of the case.

In order to prevent the use of the apparatus until a coin of predetermined kind has been inserted therein, a vertically sliding shutter d is employed, which shutter is mounted in guides d^* fixed to the wall or partition a^{4*} and acts in its raised position to cover the eye-holes a^3 in the front of the case and obstruct the line of sight, and this shutter d is suspended from a chain d' which passes around a spirally grooved wheel d^2 mounted with capability of revolving upon a stud or axis of motion carried by the wall or partition a^{4*} and thence passes around a guide pulley d^3 and terminates in a tubular spindle d'^* provided, at the lower end thereof, with a disk or enlargement d'^{**} which supports a tubular weight d^4 capable of independent vertical movement upon the tubular spindle d'^*, while a guide rod or spindle, d^5 fixed to the case a, is employed, which guide rod or spindle enters the tubular spindle d'^* and guides it in its movements.

The weight d^4 normally holds the shutter in its raised or closed position, so as to obstruct the line of sight, but it is capable of being raised, as hereinafter more fully described, so as to allow of the shutter d being lowered until an aperture d^{**} therein is in alignment with the eye-pieces a^{3*}, thus permitting the instrument to be used.

The object of forming the weight d^4 loose upon the spindle d'^* is to enable it to rise and fall freely upon the spindle d'^* and independently thereof, and thus prevent possible injury to the instrument by depressing the pedal lever, hereinafter referred to, without inserting the prescribed coin.

The spirally grooved wheel d^2 has fixed thereon a pin or stud d^{2*}, shown more particularly at Fig. 8, which pin or stud is normally engaged by a tooth or projection e' upon a weighing beam or lever e which is mounted upon an axis of motion e^*, carried by a bracket e^{**} from the wall or partition a^{4*}, and this weighing beam e is counterbalanced by means of an adjustable counterweight e^2, in such manner, that a coin of the prescribed kind inserted into the machine will depress the opposite end of the beam or lever e and withdraw the tooth e' from the stud d^{2*} of the spiral wheel d^2, thus permitting the wheel d^2 to revolve and the shutter d to descend by gravity.

The coin is conducted into an open ended pocket e^3, carried by the weighing beam e, by means of an inclined upper chute or guide f' leading from a vertical chute f connected with the usual money slot a^{**} in the front of the machine, and the pocket e^3 is so arranged that its lower end normally bears against, or is held in near contact with a fixed plate g carried by a bracket g^* from the case a, so that the coin cannot be discharged from the pocket e^3 until the shutter d has been properly released, as hereinafter described, when the mouth of the pocket e^3 will descend below the fixed plate g sufficiently to allow the coin to be discharged into a lower money chute g' by which it is conducted to a card delivering apparatus, hereinafter described.

In order to prevent a second coin, inserted into the instrument while the money pocket e^3 and weighing beam e are partially depressed, from blocking the machine, a guide e^4 is hinged at e^{4*} to the upper part of the pocket e^3 by its upper end, and at its lower end extends over or through an aperture in the plate g so as to conduct the coin into the lower money chute g'. The said guide, by the depression of the pocket e^3 with the weighing beam e, is brought into alignment with the upper money chute f' conducting the coin from the money slot a^{**}, so that if a coin, at that time, be inserted into the machine, it will be conducted by the guide e^4 into the lower money chute g'.

The weighing beam e, as represented more particularly at Fig. 8, is prevented being fully depressed, and thus discharging the coin from the pocket e^3 into the lower money chute g' until the shutter d is lowered to give access to the machine, by means of a stop formed by a bracket d^{***} carried by the shutter d, and which engages a set screw e^5 carried by the weighing beam e and prevents the descent thereof, sufficiently to allow the mouth of the pocket e^3 to descend below the plate g the required distance to discharge the coin into the lower money chute g', until the shutter d has descended, when the weighing beam e will descend to the extremity of its traverse, as shown more clearly at Fig. 9, and discharge the coin from the pocket e^3 into the lower money chute g', the extreme movement of the weighing beam e being regulated by means of set screws e^5 carried by a bracket e^{6*} from the wall or partition a^{4*}.

The weight d^4 is raised, in order to permit of the shutter d falling, by a person operating the machine after the insertion of the prescribed coin, as hereinbefore described, by means of a pedal lever or foot plate h, located at the base of the machine, which latter is provided with a recess or opening a'^* to accommodate the foot of the operator, and this pedal lever h is mounted upon a center of motion h^* carried by a bracket h^{**} fixed to a portion of the frame a.

The outer end, or foot plate, of the pedal lever is formed with inclined sides, in order to prevent a second person placing his foot thereon, so as to hold the pedal lever h depressed, and thus obtain the use of the apparatus without inserting a second coin. The inner end of this pedal lever h acts upon a vertical pin or bolt h', mounted loosely in a guide h'^* in the frame a, and this pin or bolt h', at its upper end, acts upon one end of a rocking lever h^2, mounted upon an axis of motion h^{2*} carried by a bracket h^{2**} fixed to the frame a, and the opposite end of the rocking lever h^2 is, by a connecting rod h^3 pin-jointed thereto, connected with one end of a cranked rocking lever h^4 located at the upper part of the machine, and mounted upon an axis of motion h^{4*} carried by a short standard h^{4**} fixed to a portion of the case a, and the opposite end of the rocking lever h^4 is formed with a fork h^{4***} which embraces the weight d^4 upon the tubular spindle d'^*, and acts upon an enlargement d^{4*} of the weight d^4 in order to raise the same, and the shutter d is thus lowered by pressure applied to the pedal lever or foot plate h.

In order to deliver to a person operating the machine a card upon which he may make a note of the indicated number of the glass suited to his sight, the following means are employed: At the front of the machine is arranged an issuing orifice i^* for the cards, beneath which orifice is provided a tray or receiver $i^{*\prime}$, and within the case a of the machine, and above the issuing orifice i^* is fixed a tubular or skeleton reservoir i, in which the cards to be delivered are piled in a column, as is well understood, so as to rest upon a table i' carried by a bracket i'^* from the case a, and located upon a level with the lower side of the issuing orifice i^*. Sliding in or upon guides i'^{**} carried by the table i', and arranged upon a level with, and so as to slide upon the top of, the table i', is a pusher i^2 which is drawn forward to deliver a card by means of a weight i^3 connected therewith by a cord or chain i^{3*} passing over a guide pulley i^{3**} carried by a bracket i'^{***} from the under side of the table i'. The pusher i^2 is retracted in readiness for the forward movement upon pressure being applied to the pedal lever h by means of a bell crank lever j which is mounted upon an axis of motion j^* carried by the bracket i'^*, and the upper arm of which bell crank lever bears against a projection i^{2*} from the under side of the pusher i^2, and the lower arm of which is pin-jointed to the upper arm of a connecting rod j', which, by means of an interposed coiled spring j'^*, is connected with the end of the rocking lever h^2, so that pressure applied to the pedal lever h will cause the retraction of the pusher i^2.

The full retraction of the pusher i^2, that is to say, the retraction of the pusher the distance necessary to enable it to clear the column of cards, so that in its next forward movement it will engage and push out one of such cards, is prevented, until a coin has been inserted into the machine, by means of the following device, which is represented more particularly at Figs. 10, 11 and 12.

Near the termination of the backward traverse of the pusher i^2 is arranged a stop lever k which is mounted upon an axis of motion k' carried by a bracket i^{**} from an extension of the table i' and arranged transversely of the pusher i^2, and this stop lever k is, at one end, provided with a tray k^2 and at the other end is counterbalanced by means of an adjustable weight k^3 mounted thereon, while it is provided with a tooth or projection k^4 which normally obstructs the backward movement of the pusher i^2, but is adapted to be moved out of the way to allow of the full retraction thereof by means of the coin (after it is discharged from the coin-operating mechanism of the shutter d) falling from the money chute g^2 upon the tray k^3 thereby depressing the lever k into the position indicated by the dotted lines in Fig. 11, and thus momentarily raising the tooth or projection k^4 clear of the path of the pusher i^2, the spring connection j'^*, between the lower rocking lever h^2 and the bell crank lever j, which upon the depression of the pedal lever h, exerts a constant force upon the pusher i^2, immediately retracting the pusher to the extremity of its traverse in readiness, on the release of the pedal lever h, to force out, by means of the weight i^3, a card of the column through the orifice i^*.

After depressing the stop lever k, the coin is discharged from the tray k^2 into the money box l when the stop lever k will be free to resume its normal position upon the forward movement of the pusher i^2.

I would here remark that I have herein shown and described the best means that I am at present acquainted with for carrying my invention into effect, but I would have it understood that the details and arrangement thereof may be varied without departing from the peculiar character of my invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a coin-freed sight-testing apparatus, the combination of two disks or frames geared to revolve in unison, and each provided with a circle of lenses, a pair of eye orifices at the front of the machine, a vertically sliding shutter located at the rear of the lenses and adapted to normally intercept the line of sight, a disk located at the back of the case and provided with a circle of indicating numbers corresponding with the lenses of the disks and geared to revolve in unison with the latter and means for rotating the lens disks and the indicating disk, substantially as herein shown and described, and for the purpose stated.

2. In a coin-freed sight-testing apparatus, the combination of a number of lenses of varying power adapted to be brought into the line of sight, means for moving such lenses, a vertically sliding shutter located at the rear of the lenses and adapted to normally intercept the line of sight, a suspension chain at one end connected with the shutter and at the other end provided with a counterbalance weight, a spirally grooved or chain wheel around which the chain passes, a stud upon such wheel, a weighing beam or lever adapted to be depressed by a coin passed into the machine, and a tooth or projection upon the weighing beam or lever normally engaging the stud of the grooved or chain wheel and means for raising the counterbalance weight, substantially as herein shown and described, and for the purpose stated.

3. In a coin-freed sight-testing apparatus, the combination of a wheel which receives a reciprocating rotary movement and is provided with a stud thereon and controlling the action to be freed, a weighing beam or lever provided with a tooth normally engaging the stud of the wheel, and a counterbalanced chain or cord passing around the wheel and connected with such action, substantially as herein shown and described.

4. In a coin-freed sight-testing apparatus, a vertically sliding shutter, a suspension chain at one end connected with the shutter and at the other end provided with a counterbalance weight, means for raising the counterbalance weight to lower the shutter, a spirally grooved or chain wheel around which the suspension chain passes, a stud upon such wheel, a counterbalanced weighing beam or lever furnished with a tooth or projection normally engaging the stud of the chain-wheel, a pocket upon the end of the lever or weighing beam, into which a coin passed into the machine is conducted, a stop upon the sliding shutter engaging the weighing beam or lever, and preventing its full depression, a fixed plate for preventing the discharge of the coin from the pocket until the weighing beam has been fully depressed and a guide hinged to the pocket for diverting superfluous coin, substantially as herein shown and described and for the purpose stated.

5. In a coin-freed sight-testing apparatus, the combination of a vertically sliding shutter, a weighing beam or lever for controlling the descent of the shutter and a stop upon the shutter for preventing the descent of the weighing beam and discharge therefrom of the coin until the shutter has fallen, substantially as herein shown and described.

6. In a coin-freed sight-testing apparatus, the combination of a vertically sliding shutter, a weighing beam or lever for controlling the descent of the shutter, a stop upon the shutter to prevent the full descent of the weighing beam and discharge therefrom of the coin until the shutter has fallen and a guide hinged to the pocket at one end of the weighing beam for diverting any coins inserted in the machine subsequently to the descent of the weighing beam upon the stop, substantially as herein shown and described.

7. In a coin-freed sight-testing apparatus, a vertically sliding shutter, a suspension chain at one end connected with the shutter and at the other end connected with a tubular spindle, a guide for the said spindle, a hollow counterbalance weight loosely mounted upon the spindle and held in place thereon by a flange or projection upon the spindle, a lever at one end forked to engage the hollow weight, a pedal lever located at the base of the machine and connections from the pedal lever to the weight lever, substantially as herein shown and described and for the purpose stated.

8. In a coin-freed sight-testing apparatus, the combination of an issuing orifice, a table, a reservoir for a column of cards, a pusher for delivering the cards, means for automatically advancing the pusher, means for retracting the pusher upon the depression of the pedal lever, and a coin-freed stop for preventing the full retraction of the pusher until a predetermined coin has been inserted into the machine, substantially as herein shown and described.

9. In a coin-freed sight-testing apparatus, the combination of an issuing orifice, a table, a reservoir for a column of cards, a pusher for delivering the cards, a weight or spring for automatically advancing the pusher, a bell crank lever acted upon through suitable

connections or means from the pedal lever for retracting the pusher, a spring interposed in said connections or means, a counterbalanced lever provided with a tooth or stop for normally preventing the full retraction of the pusher until the insertion into the machine of the proper coin, and a tray upon the stop lever to receive the coin, substantially as herein shown and described and for the purpose stated.

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