No. 670,173. Patented Mar. 19, 1901.

H. H. FOX.

CHANGE MAKING MACHINE.

(Application filed Dec. 14, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

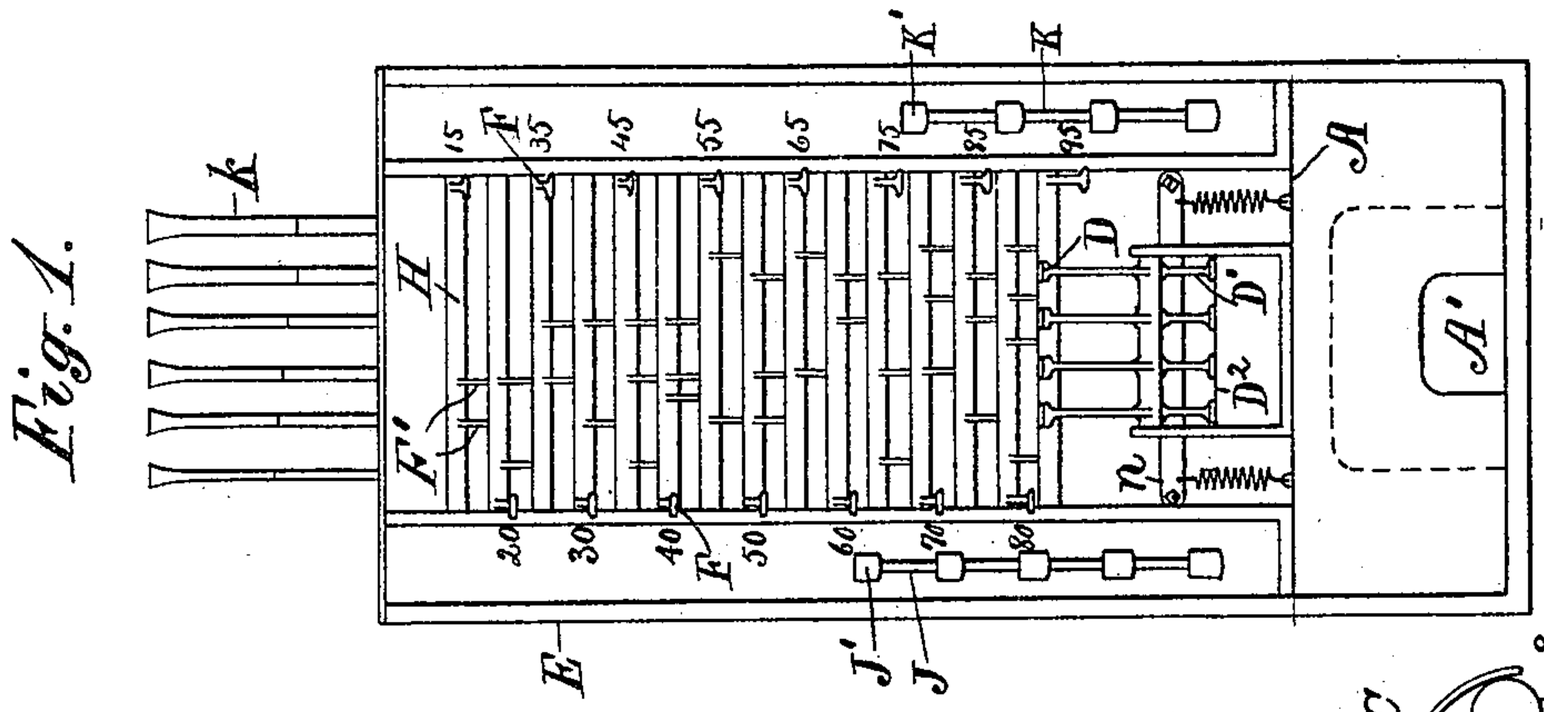


Fig. 2.

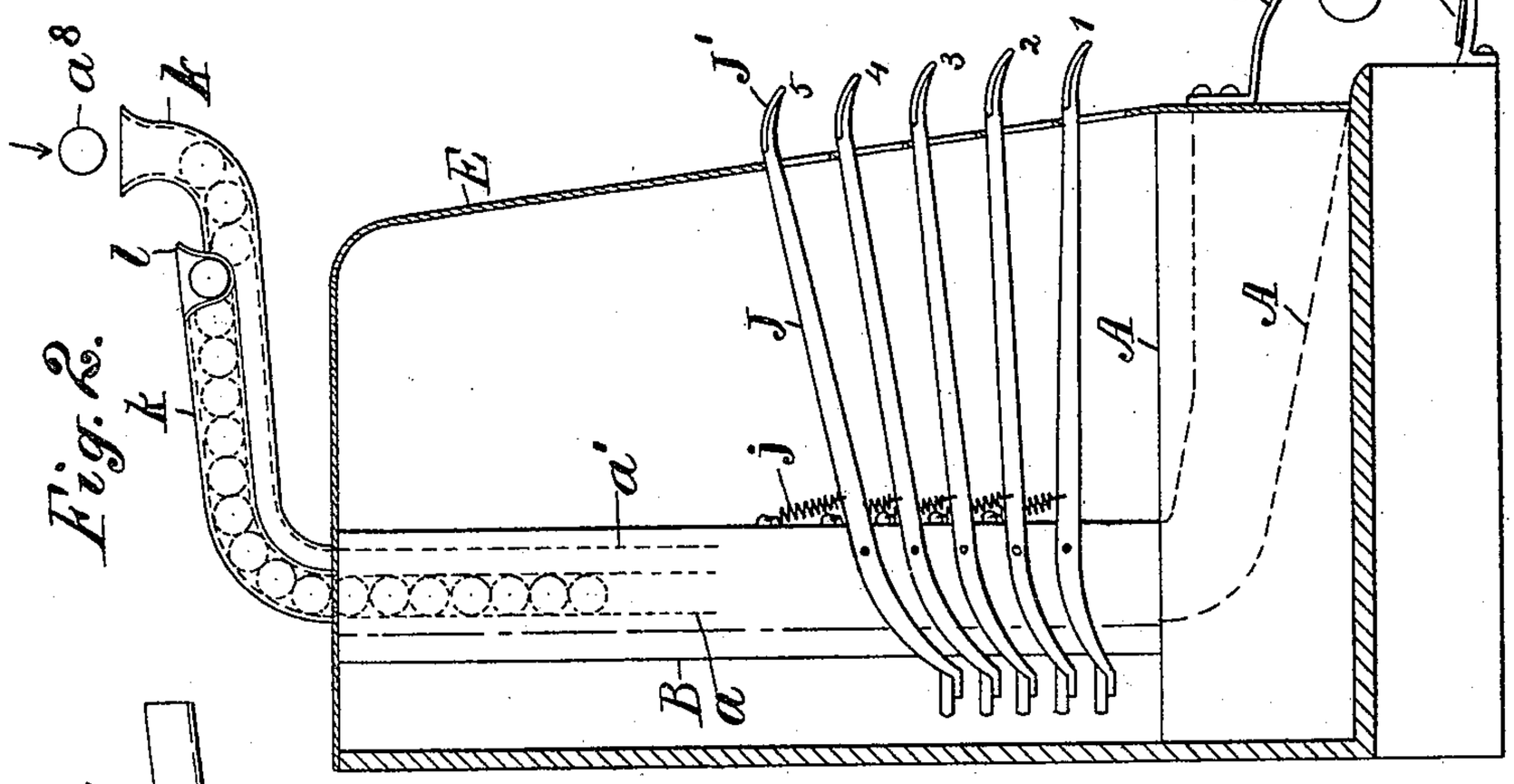
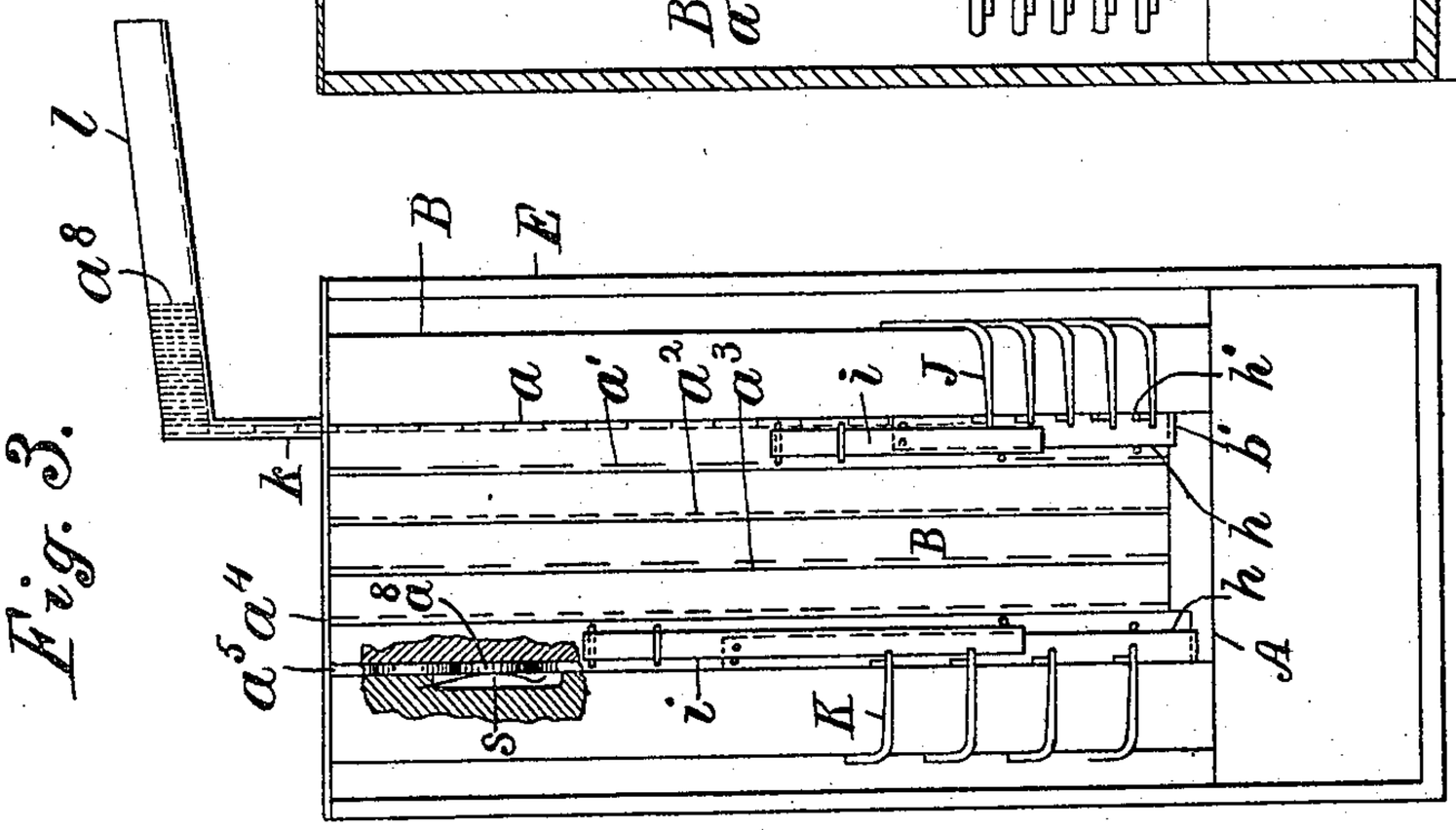


Fig. 3.



Attest:
L. W. Wolf
Walter H. Talmage.

Inventor.
Henry H. Fox, per
Thomas S. Crane, Atty.

No. 670,173.

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H. H. FOX.

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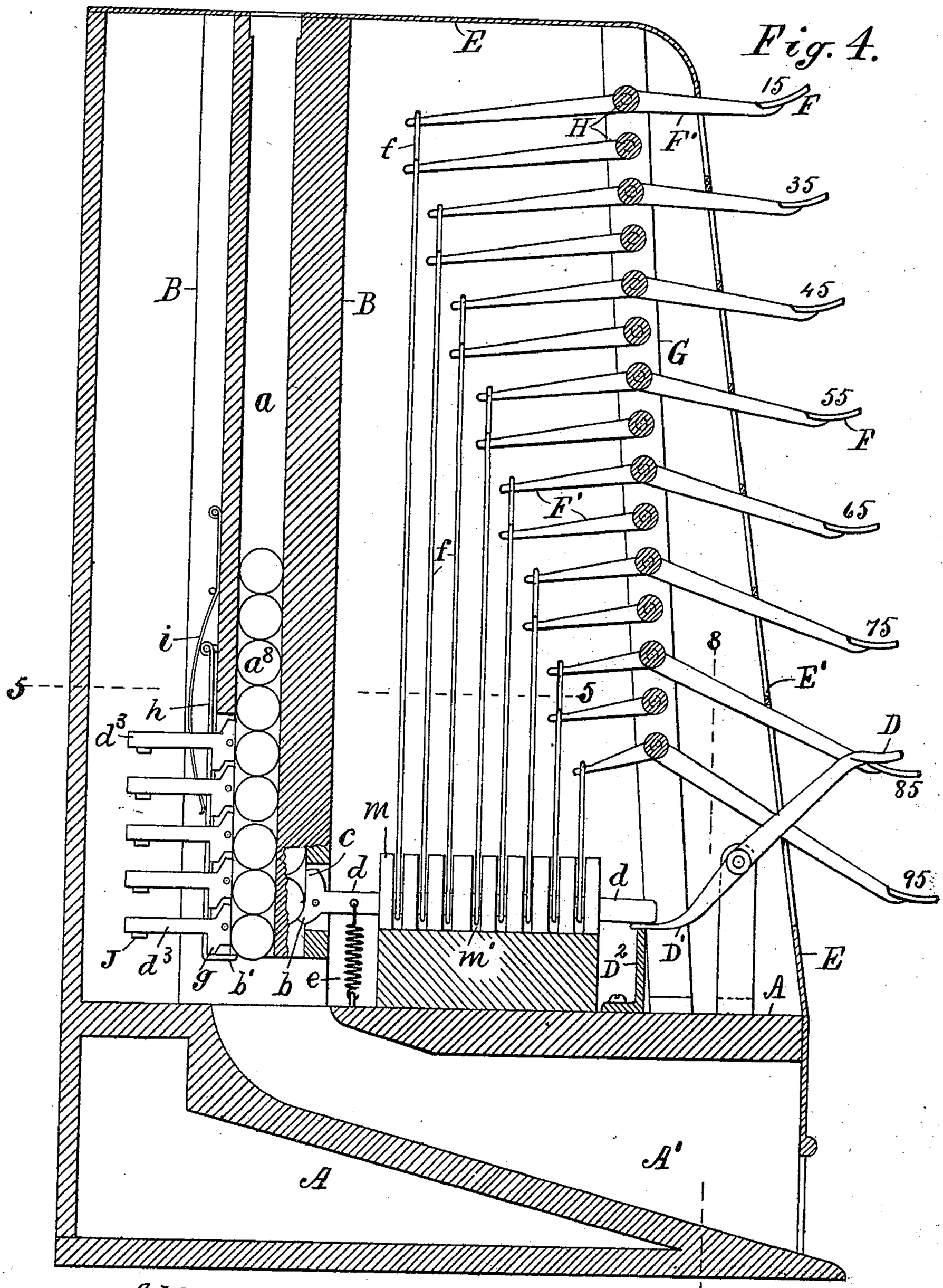
4 Sheets—Sheet 2.

Fig. 4.



Attest:

Walter H. Talmage

Inventor.

Henry H. Fox, per

Thomas S. Crane, Atty.

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H. H. FOX.

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(No Model.) 4 Sheets—Sheet 3.

Fig. 6.

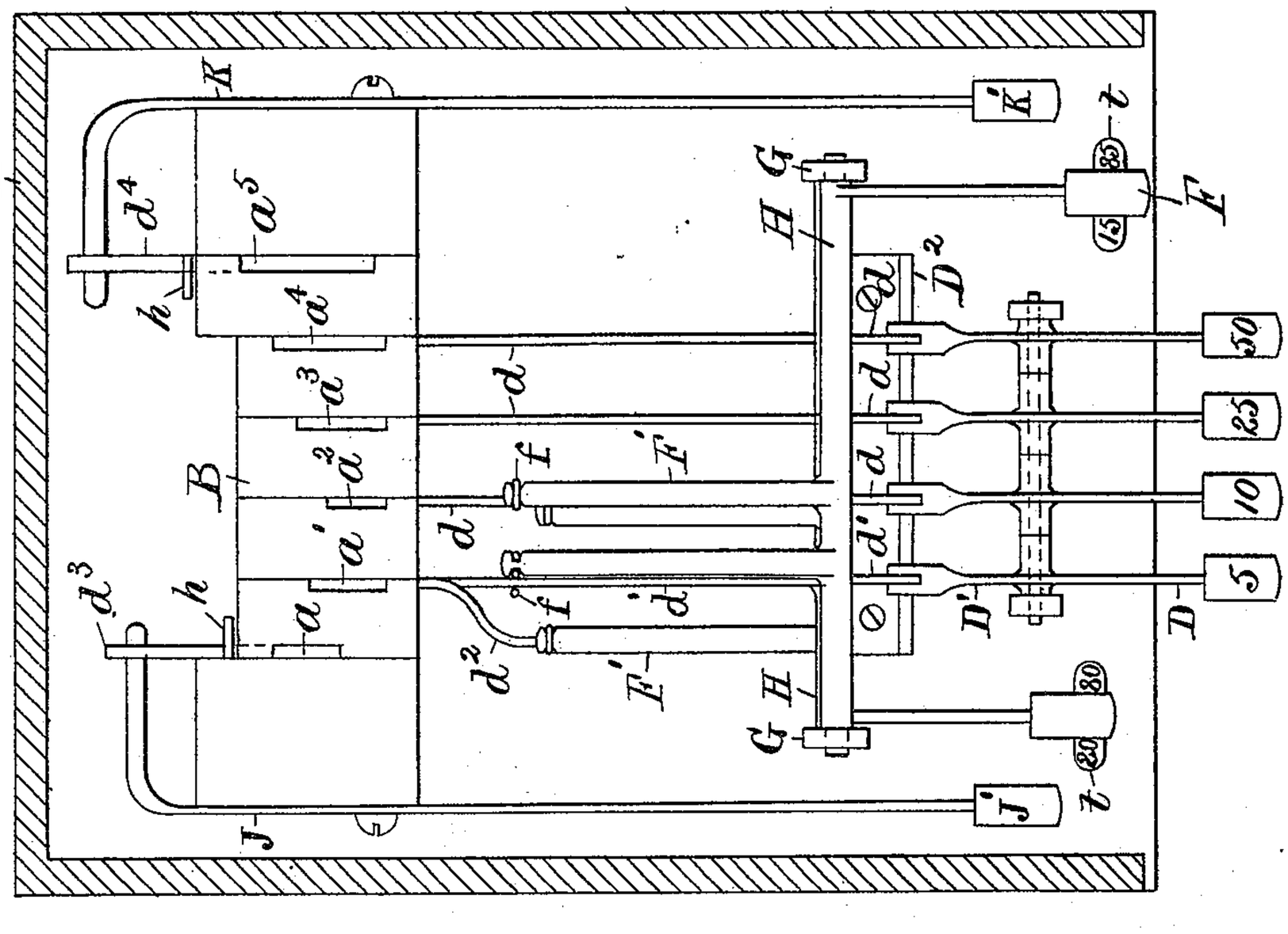
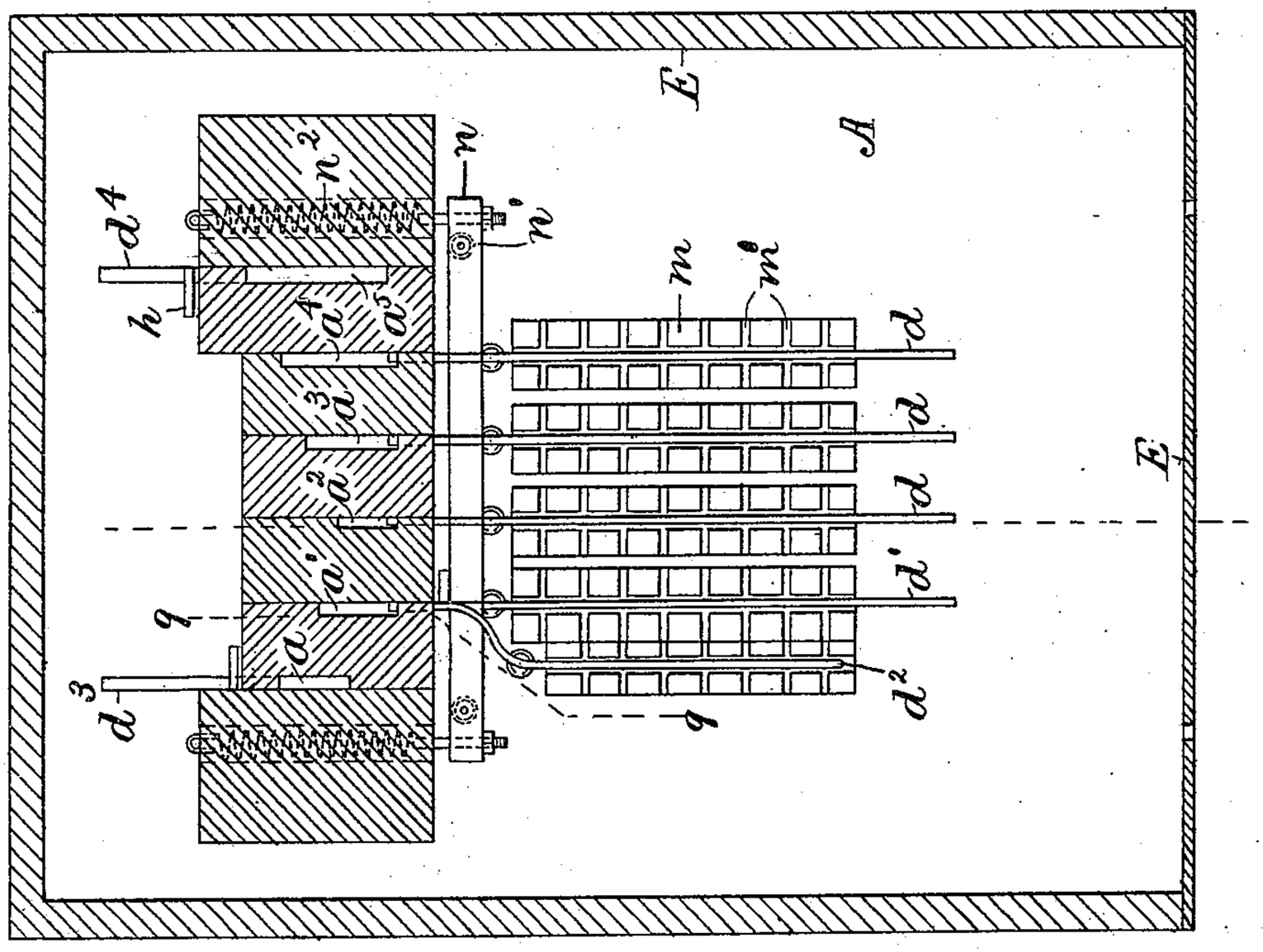


Fig. 5.



Attest:
H. W. Goepel
Walter A. Talmage.

Inventor.
Henry H. Fox, per
Thomas S. Crane, Atty.

No. 670,173. Patented Mar. 19, 1901.

H. H. FOX.

CHANGE MAKING MACHINE.

(Application filed Dec. 14, 1900.)

(No Model.) 4 Sheets—Sheet 4.

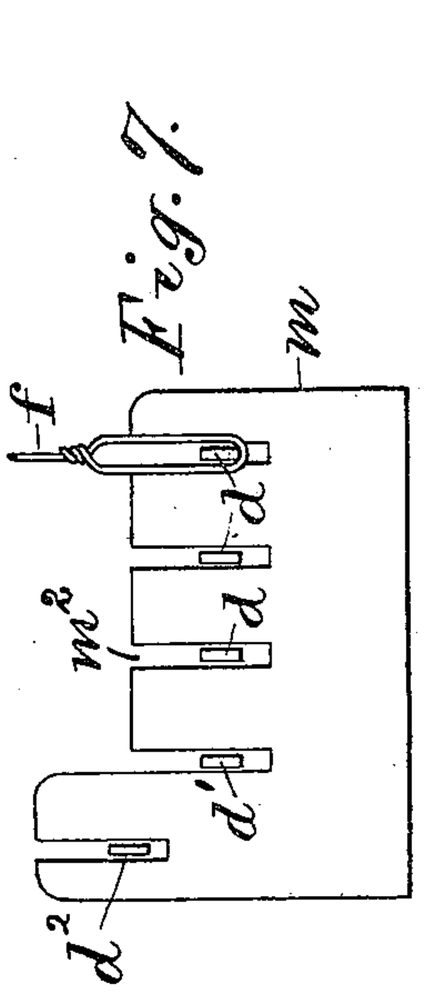


Fig. 7.

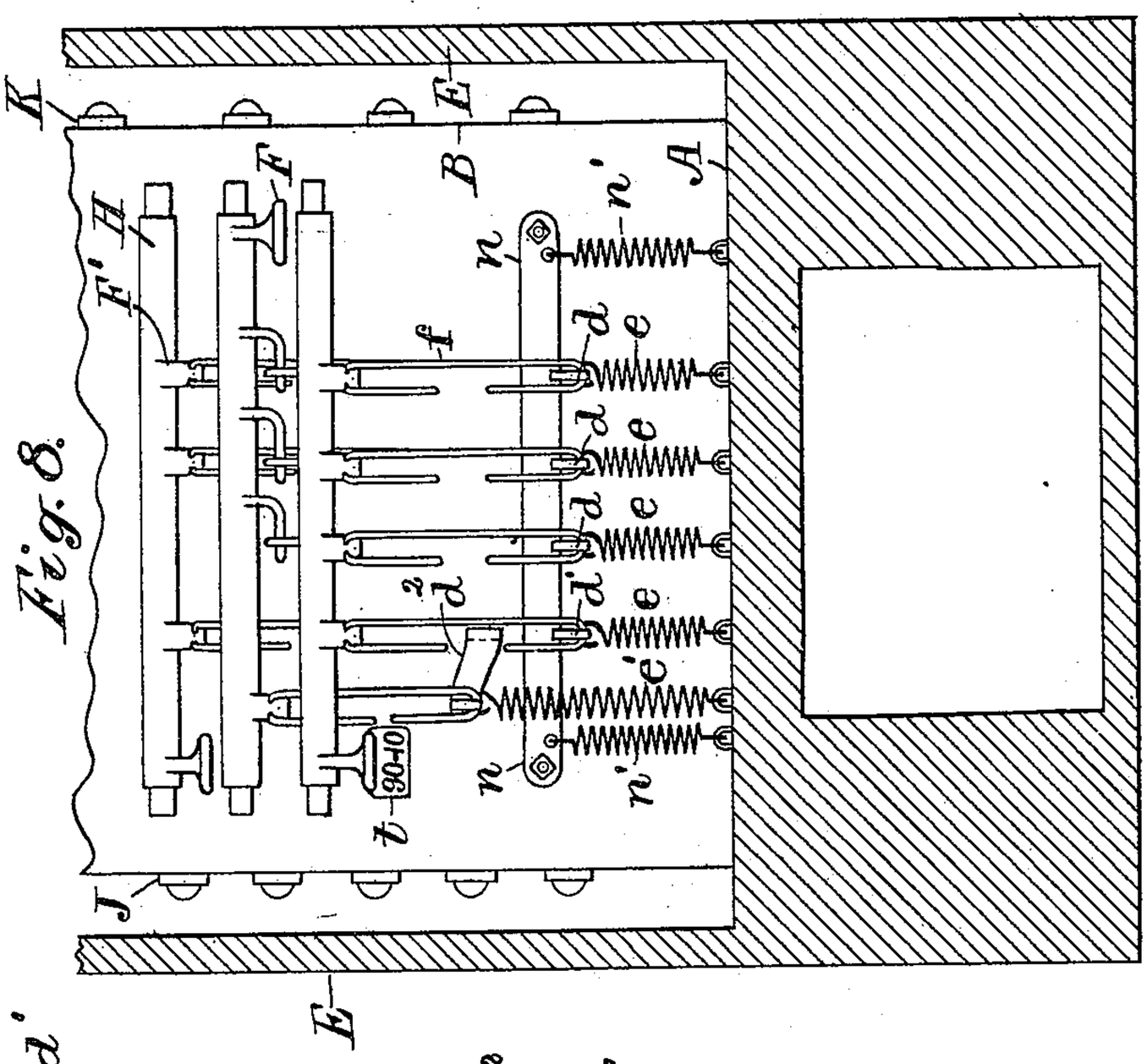


Fig. 8.

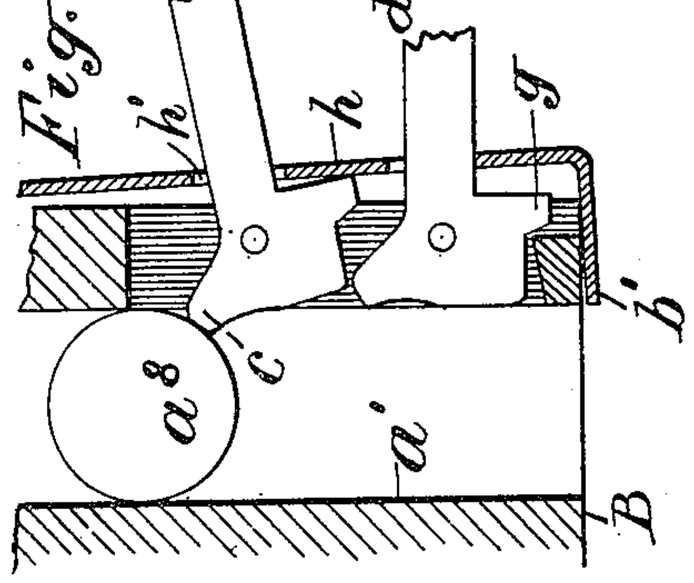


Fig. 10.

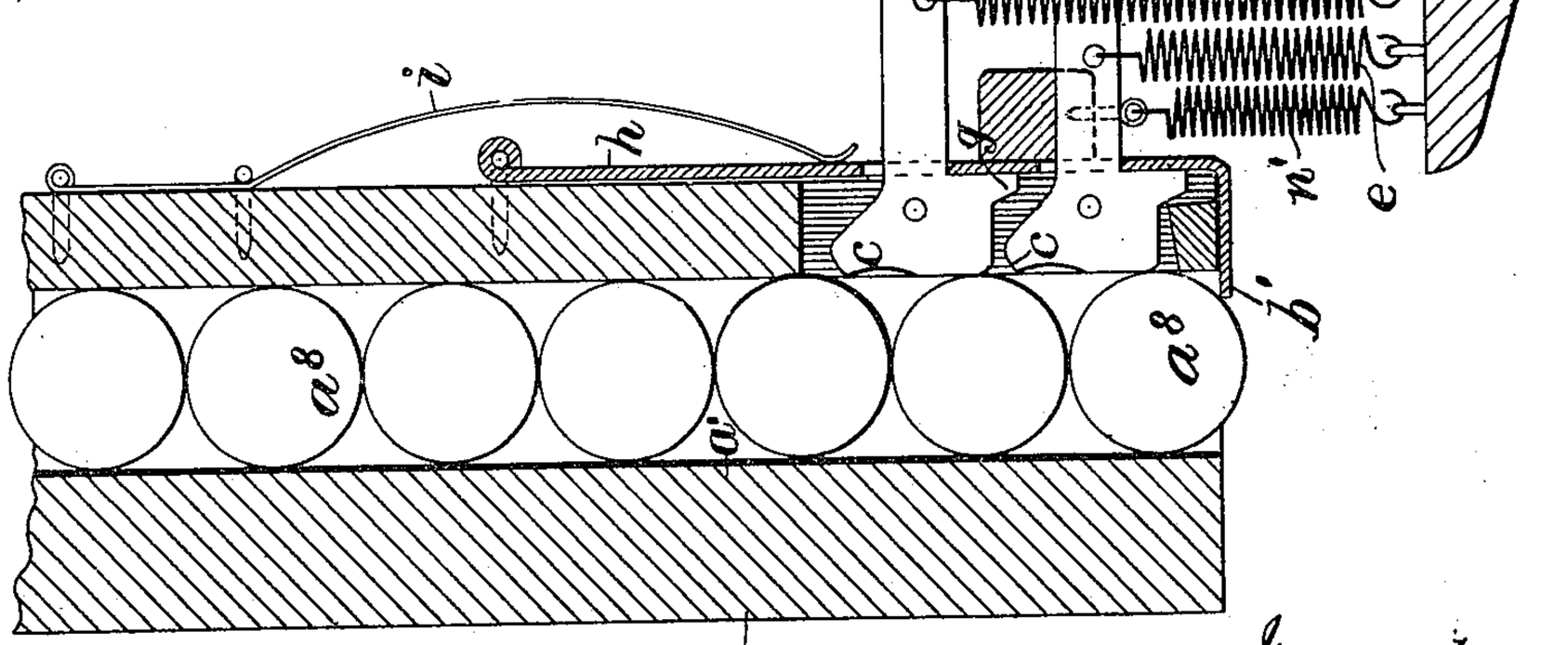


Fig. 9.

Attest:
Litwoef
Walter H. Dalmage.

Inventor.
Henry H. Fox, per
Thomas S. Crane, Atty.

UNITED STATES PATENT OFFICE.

HENRY H. FOX, OF ROSETON, NEW YORK.

CHANGE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,173, dated March 19, 1901.

Application filed December 14, 1900. Serial No. 39,830. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. FOX, a citizen of the United States, residing at Roseton, Orange county, New York, have invented certain new and useful Improvements in Change-Making Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to a machine in which coins of various denominations are supported in separate channels; and one important object of the invention is to furnish a change-making machine in which the operation of a single key may discharge two, three, four, or more coins simultaneously from the same channel.

Another object of the invention is to furnish a means of discharging the coins by the mere action of gravity from their respective channels in the holder and to thus obviate the strain upon the actuating-key which is involved in discharging the coin by the usual laterally-moving slider.

These objects are attained by forming the holder with a series of flat channels adapted to support coins of different denominations upon edge and providing each channel with a latch-lever adapted to release one or more coins when actuated by a finger-key. The latch-lever is connected either directly or indirectly with a toe which retains the coins normally in the channel and with a jaw projected from the upper side of the lever into the channel when in operation to arrest the column of coins when the lower coin is released by retracting the toe.

By supporting the coins on edge in the channel and applying the latch-levers to the edge of the channel access is afforded to the space between adjacent coins for introducing the arresting-jaw, and the column may thus be cut or intersected at any point and all the coins below such point released and discharged.

The invention includes various details of construction hereinafter claimed and which will be understood by reference to the annexed drawings, in which—

Figure 1 is a front elevation of the apparatus with the shell of the casing removed. Fig. 2 is a side elevation of the finger-levers for discharging cents, the casing being omitted which normally covers the same. Fig. 3 is a rear elevation with the rear casing omitted. Fig. 4 is a section through the cent-channel a, with a part of the adjoining channel a' broken away to expose its interior and the latch connected therewith; and Fig. 5 is a plan in section on line 5 5 in Fig. 4, with all the finger-keys and their bearings removed to exhibit the guide-combs for the latch-lever links. Fig. 6 is a similar plan showing the finger-keys and a part of the shafts and links for the combination-keys, the guide-combs being omitted. Fig. 7 is an elevation of the guide-combs and levers, with part of one link. Fig. 8 is a section on line 8 8 in Fig. 4, with a view of the holder in the rear, only the bottom of the machine being exhibited. Fig. 9 is a vertical section of the holder for the nickels, with the latch-levers and their attachments. Fig. 10 is a similar view near the bottom of the holder, with the jaw of the upper latch-lever pressed into the channel. Figs. 4 to 8, inclusive, are upon a larger scale than Figs. 1 to 3; and Figs. 9 and 10 are upon a still larger scale, representing the coins and holder of the natural size.

A designates the base of the machine, having an inclined delivery-chute A′, which opens at its upper end beneath the bottom of the holder B. The holder is provided with a vertical flat channel a for cents, a similar channel a' for nickels, a channel a^2 for dimes, a channel a^3 for quarters, a channel a^4 for half-dollars, and a channel a^5 for silver dollars.

A latch-lever d (see Fig. 4) is pivoted in the holder at the front edge of each of the channels a^2 a^3 a^4 near the bottom and provided with a toe b at the lower corner to retain the coins normally in the channel and a jaw c at the upper corner, which is held normally out of the channel. The raising of the lever retracts the toe from beneath the bottom coin and permits its escape, while the jaw upon the upper corner simultaneously penetrates the channel and retains the column of coins above the one discharged.

Two latch-levers d' and d^2 (see Fig. 9) are pivoted one above the other at the front of the channel a' and provided each with the jaw c. At the rear edge of the channel a five latch-levers d^3 are pivoted one above another,

and at the rear edge of channel a^5 four levers d^4 are pivoted one above another. The vertical series of levers at the edge of the channel a, a', or a^5 is intended to discharge more than one coin simultaneously, as will be hereinafter described. The lever d^2 operates to discharge two nickels simultaneously where it is desired to furnish change for ten cents or to make a large volume of change with more than one nickel, and the levers d^3 or d^4 operate, respectively, to discharge several cents or several silver dollars simultaneously where change for a nickel or for five dollars is desired. The finger-keys J and K, connected, respectively, to the levers d^3 and d^4, are termed "multiple levers" herein, as they discharge more than one coin at once from the same channel. The coins fall from the bottoms of all the channels into the chute A', from the front of which they escape into the hand of the operator or into the receptacle, if one be placed at such point.

In Fig. 2 the apparatus is shown with a deflector C for throwing the coins downward as they emerge from the box and with a concave receiver C' to catch the coins as they fall from the deflector; but the hand may obviously be used instead of the receiver to catch the coins.

Discharging single coins.—The latch-levers d and d' project in the same plane from the front of the holder, and their forward ends rest upon the ends of lifting-levers D', which are supported normally by a stop D^2. The lifting-levers are provided with finger-keys D, which project outside the casing E. Each latch-lever is pressed downward independently by a spring e and holds the key D normally elevated. These levers d and d' form a horizontal series, each of which is adapted to discharge one coin only from its connected channel when it is actuated by the finger-key D. The keys D or the casing E, adjacent to the same, are labeled, respectively, "5," "10," "25," "50," to indicate the coins which they operate to discharge.

Combinations of the latch-levers.—A series of shafts H is arranged above the said levers and provided with finger-keys F and connections to two or more of the said levers, so as to discharge two or more coins simultaneously from their respective channels. The shafts are journaled one above another in bearings upon two posts G, and two or more arms F' are projected from each shaft and extended over different points of the said levers and connected thereto by links f. The links are formed with slots at the ends equal to the movement of the arms, as shown in Fig. 8, and the arms are notched where fitted to the slots to hold the links in place. The projections of the arms from the shafts H are graduated, as shown in Fig. 4, so that various links may connect with the same lever, and the pressing of any of the finger-keys F may thus operate to raise such lever independently. I term the keys F "combination-keys," as the shafts with which they are connected are combined with two or more of the latch-levers, so as to furnish combinations of the single coins. In Fig. 6 only two of the shafts H are illustrated to avoid confusing the drawing, the upper shaft (which is the only one that shows clearly) being connected by two arms with the lever d' and the lever adjacent thereto, so as to discharge one nickel and one dime simultaneously to furnish fifteen cents in change. Two arms F', which are shown projecting from the lever below, are connected, respectively, with the latch-lever d upon the dime-channel and the lever d^2, which discharges two of the nickels, thus delivering twenty cents in change at once. In Fig. 8 the lowest shaft is shown with four arms connected to the three levers d and the lever d', thus discharging a fifty-cent, a twenty-five-cent, a ten-cent, and a five-cent piece and making ninety cents in change. The shaft next above is shown with four arms connected to the three levers d and the lever d^2, thus discharging ninety-five cents in change. The upper shaft (shown in Fig. 8) is provided with three of the arms F', connected to the fifty-cent and twenty-five-cent latch-levers and the lever d', thus discharging eighty cents in change. The shafts are provided with finger-keys alternately at their right and left hand ends, and the shafts are so connected with the latch-levers that the so-called "combination-keys" at the right or left hand side of the shafts operate to discharge coins forming a multiple of ten, while the series of keys at the opposite side of said shafts operate to discharge coins forming a multiple of five. The finger-keys F are for convenience arranged to form two vertical series, one of which would therefore be labeled "90," "80," "70," "60," "40," "30," "20," while the other would be labeled "95," "85," "75," "65," "55," "45," "35" "15." To facilitate the use of these combination-keys, I prefer to provide the label t with an additional mark or number indicating the difference between the value of the coins discharged and a given maximum, as one dime or one dollar. The key F, (shown in Fig. 6,) which discharges eighty cents, would be labeled, as indicated, with the number "80" at one side, which would be printed in white or black, and with the number "20" at the opposite side, which would preferably be printed in a different color, as red or yellow. Where a purchase of twenty cents is made and one dollar is presented for change, the operator can use the bright-colored label indicating the amount of the purchase, as twenty cents, and then operate such key to secure the correct change required without first computing the difference between such purchase price and one dollar. In like manner all of the combination-keys may be furnished with two labels indicating the difference between the amount of change they are adapted to discharge and one dollar.

From the above description it will be seen that the finger-keys D are used to discharge

single coins of any denomination from five cents to fifty cents, while the combination-keys F are used to discharge any combination of the coins between five cents and one dollar.

Multiple keys.—Figs. 9 and 10 show the construction and operation of the multiple-key latch-lever, which discharges two or more of the coins a^8 at pleasure. These figures show the channel a' for the nickels, with the lever d^2, pivoted over the lever d' upon the edge of the channel at a distance equal to the diameter of a nickel. Five of the multiple latch-levers d^3 are shown in Fig. 4 applied to the cent-channel a, and four of the multiple latch-levers d^4 are in like manner applied to the dollar-channel a^5, and the illustration in Figs. 9 and 10 shows the operation of all such multiple latch-levers, whatever number be arranged in a single vertical series. Each of these multiple latch-levers is furnished with an integral upper jaw c, adapted to extend beneath a coin in the channel, and with an opposed heel-piece g, connected with a toe b', which projects beneath the bottom coin of the channel and normally supports the entire column. The toe is shown formed upon the bottom end of a so-called "spring-plate" h, which is pivoted at its upper end to the holder and is pressed toward the heel-piece by a spring i. The lifting of either of the levers operates, as is shown in the upper lever in Fig. 10, to throw the jaw c into the channel beneath one of the coins and to simultaneously move the heel-piece backward, thus pressing the spring-plate backward and retracting the toe b' from the bottom of the column. All the coins below the ones supported by a jaw c are thus discharged simultaneously, whether the number be one, two, three, four, or more. Such operation is secured by holding all of the jaws c normally out of the channel, as shown in Fig. 9, so that whichever one is pressed into the channel (simultaneously with the retraction of the toe) the jaws below it offer no obstruction to the discharge of the adjacent coins. The levers d^3 (shown in Fig. 4) are thus adapted to discharge one, two, three, four, or five of the cents, as may be desired, the upper lever serving to arrest the remainder of the column of coins while retracting the toe b' to discharge the five coins below such jaw. The four levers d^4 upon the dollar-channel a^5 are constructed and operated in a similar manner and permit the discharge of one, two, three, or four dollars at once, as may be required. The latch-levers d^3 and d^4 are shown projected at the back of the holder; and levers J and K are applied, respectively, to the latch-levers for discharging the cents and the dollars and are extended beyond the front of the casing and provided with finger-keys J′ and K′, as shown in Figs. 1 and 2. In Fig. 2 springs j are shown applied to the levers J to press their front ends normally upward, stops being provided by slots E′ in the casing E. (See Fig. 4.) The rear ends of the levers J and K are bent to extend, respectively, under the latch-levers d^3 and d^4, so as to lift any of the same independently. The spring-plate h is formed with notches h' (see Fig. 10) to fit over each of the levers d^2, d^3, or d^4 and also permits a sufficient upward movement of the lever when pressing the heel-piece outward toward the plate. The bottoms of the notches h', as shown in Figs. 9 and 10, serve as stops to hold the levers normally in a horizontal position, and thus keep their inner ends flush with the walls of the channel, so as to form a guide for the coins when moving past the latch-levers.

With the multiple keys it will be observed that the toe which supports the coins normally in the channel is not attached directly to the latch-lever, but is actuated thereby whichever one in the vertical series of levers is moved. The operation is therefore the same as with the single levers in the horizontal series, which have an integral toe to support the coins normally and an integral jaw to sustain the column when the toe is retracted.

Charging the channels with coins.—Feed-channels k are shown in Figs. 1 and 2 extended from the tops of certain of the vertical channels and bent laterally from the top of the vertical channel, whereby the weight upon the latch is restricted to the column in the vertical channel, which I term the "reservoir-channel." The coins may be inserted in the feed-channel by hand, or an inclined hopper l (shown upon one of the channels in Figs. 2 and 3) may be fitted to one side of the same, in which a loose roll of coins a^8 may be laid and delivered automatically into the feed-channel. The inclined channel is adapted to feed the roll downward gradually as the coins are drawn from the reservoir-channel and flow from the feed-channel to supply the same.

Any other means may be employed to supply the reservoir-channels with coins, and the feed channels and hoppers may all be inclosed in a case to prevent access to the stock of coins for supplying the channels.

Resistance to shocks upon the latch-lever.—It is obvious that when first charging the channels the strain upon the toe of the latch-lever caused by dropping the coins into each channel is greater than that produced by the mere static pressure of the coins, and to resist such strain and avoid making the springs e very heavy I apply a pressure-bar to the tops of the levers d and d' and make the bar heavy enough to resist by its inertia the lifting tendency of the levers under such shocks. In Figs. 1, 5, 8, and 9 the pressure-bar n is shown applied to the tops of the levers d and d' in the horizontal series and provided with springs n' to pull it downward and with springs n^2 to press it toward the holder. The springs n^2 press the bar n normally toward the spring-plate h, and thus help to sustain the toe of such plate in action. The springs

n' and n^2 are made only of sufficient strength to hold the bar pressed upon the latch-levers and spring-plate h, and the pressure-bar does not, therefore, greatly resist the natural movement of these parts when actuated by the finger-keys; but its weight and inertia serve to resist any sudden movement of the latch-levers or any sudden backward movement of the toes.

Arrangement of finger-keys.—The vertical series of levers for the cent-channel a and the dollar-channel a^5 are shown projected backwardly from the channels and their actuating-levers extended along the sides of the holder through the front of the casing. It is obvious that the levers for these channels could be projected from the front of the holder the same as the levers d, d', and d^2 and their actuating-levers pivoted upon suitable supports. It is not, therefore, material how the latch-levers are arranged if the horizontal series of levers are connected with combination-keys, as described, and the latch-levers in the vertical series are provided with separate keys.

Spring to restrain heavy coins.—Fig. 3 shows a spring s inserted in a recess in the side of the channel a^5, which receives the dollar-coins. Such spring is intended to retard the descent of the coins without wholly arresting the same, and thus operates to diminish the momentum of the coins when dropped into the channel and also to diminish their static pressure upon the latch or toe. The spring s is shown near the top of the channel, but may be placed at the bottom or at both points.

Facility of construction.—The construction of the machine and the connection of the latch-levers with the arms upon the shafts is greatly facilitated by making them, as shown in Figs. 4 and 8 of the drawings, of wire with loops at the ends, which are readily slipped over the ends of the latch-levers into the proper position upon the same and thereafter permit the levers to rise independently of such loops when actuated by other of the arms. Fig. 6 shows, adjacent to the lever d', one of the arms F', with the wire loop in section where applied to the same to exhibit the notches in the edges of the arm which hold the wire loop in place. Fig. 8 shows the loops open at their inner ends, while Fig. 7 shows the loop closed by twisting the wire; but the open loop is desirable at the top, as it permits the application of the arm F' most readily to the open end of the loop. The loops may thus be applied and removed in the course of construction and in the adjustment of the machine without disconnecting any screws, pins, or other pivotal connections.

To hold the links in place at various points in the length of the levers $d\ d'\ d^2$, a so-called "comb" is fixed adjacent to the levers, with a longitudinal slot m^2 for the free movement of the lever and transverse notches m', into which the loops of the links are inserted. An end view of the comb is shown in Fig. 7, with one of the loops lying against the side of the notch m'. A longitudinal section of the same is shown in Fig. 4, with eight of the wire links connected with the dime-lever d, as the dime is used in that number of combinations. A plan of the comb is shown in Fig. 5; but the connection of the links with the levers is omitted to show the combs more clearly.

Having thus set forth the nature of the invention, what is claimed herein is—

1. In a change-making machine, the combination, with a holder having a flat channel for supporting the coins on edge, of a vertical series of latch-levers each pivoted at the side of the channel and each having a jaw adapted to extend beneath one edge of a coin in the channel, and adapted each to discharge all the coins below such jaw.

2. In a change-making machine, the combination, with a holder having a flat channel for supporting the coins on edge, of a vertical series of latch-levers each pivoted at the side of the channel and each having a jaw adapted to extend into the channel and a heel-piece upon the lever opposed to such jaw, and a spring-plate pressed upon the series of heel-pieces to hold the jaws normally out of the channel.

3. In a change-making machine, the combination, with a holder having a flat channel for supporting the coins on edge, of a vertical series of latch-levers each pivoted at the side of the channel and provided with a jaw to sustain the coins above such lever, and finger-keys for operating each of said vertical series of levers independently.

4. In a change-making machine, the combination, with a holder having a series of vertical flat channels to retain coins of various denominations upon edge, of latch-levers pivoted near the bottoms of the channels, and projected side by side from the holder, combination-keys with arms extended over various points in the lengths of such levers, wire links having looped ends connecting the arms with said levers, and a comb at the side of each lever to hold the several links upon such lever in place.

5. In a change-making machine, the combination, with a holder having a series of vertical flat channels to retain coins of various denominations upon edge, of latch-levers pivoted near the bottoms of the channels and projected side by side from the holder, a series of bearings extended above the latch-levers, shafts journaled in said bearings with combination-keys upon the opposite ends of alternate shafts, arms projected from the shafts, and connections to two or more of said levers so arranged that the series of combination-keys at the right or the left ends of the shafts operate to discharge coins forming a multiple of ten, while the series of keys at the opposite ends of the shafts operate to discharge coins forming a multiple of five.

6. In a change-making machine, the combi-

nation, with a holder having a flat channel for supporting the coins on edge, of a vertical series of latch-levers pivoted one above another at the side of the channel and each having a jaw adapted to extend into the channel, a heel-piece upon each lever, a spring-plate pressed upon the series of heel-pieces to hold the jaws normally out of the channel, and having a toe at the bottom extended into the edge of the channel to sustain the column of coins, whereby the tipping of any lever to throw its jaw into the channel operates to retract the toe and discharge all the coins below such jaw.

7. In a change-making machine, the combination, with a holder having a series of vertical flat channels to support coins of various denominations upon edge, of latch-levers pivoted near the bottoms of such channels and projected side by side from the holder, shafts having combination-keys, arranged above the said levers, arms projected from the shafts over the said levers, and links with long slotted eyes at the ends for connecting the said arms and levers and permitting independent movement of the levers, as and for the purpose set forth.

8. In a change-making machine, the combination, with a holder having a series of vertical flat channels to support coins of various denominations upon edge, of latch-levers pivoted near the bottoms of the channels and projected side by side from the holder, shafts having combination-keys, arranged above the said levers, arms projected from the shafts over the said levers, and wire links having eyes formed of open-ended loops for connecting the said arms and levers detachably and also permitting independent movement of the levers, as and for the purpose set forth.

9. In a change-making machine, the combination, with a holder having a series of vertical flat channels to support coins of various denominations upon edge, of latch-levers pivoted near the bottoms of the channels, and projected from the holder upon the same plane, stops and independent springs for pressing the levers downward upon the stops, a pressure-bar applied to the tops of the levers, and springs for pressing the bar upon the levers, whereby the inertia of the bar, as well as the spring tension, resists any sudden movement of the levers.

10. In a change-making machine, the combination, with a holder having a series of vertical flat channels to support coins of various denominations upon edge, of a horizontal series of latch-levers pivoted near the bottoms of the channels and projected from the holder in the same plane, and provided each with a jaw adapted to extend into the channel, one or more latch-levers pivoted upon one of the channels above the bottom lever with jaws upon each, and heel-pieces in opposition to such jaws, a spring-plate pressed upon the heel-pieces to hold the jaws normally out of the channel, a pressure-bar applied to the tops of the levers in the horizontal series and springs adapted to press the bar upon the horizontal series of levers and also upon the spring-plate, whereby the inertia of the bar, as well as the spring tension, resists sudden movement of any of the levers.

11. In a change-making machine, the combination, with a holder having a vertical flat channel for supporting the coins on edge, of a latch-lever and finger-key to operate the same for discharging the coins, and a spring in the channel arranged to press upon the coins and retard their velocity in their descent to the latch-lever.

12. In a change-making machine, the combination, with a holder having a vertical flat channel operating as a reservoir to support a certain stock of coins on edge, and a latch-lever to sustain the coins with means for actuating the same, of a feed-channel extended laterally from the top of the reservoir-channel, with an inclined hopper at one side of the same to deliver coins automatically into such feed-channel.

13. In a change-making machine, the combination, with a holder having a flat channel for supporting the coins on edge, a toe at the bottom of the column for supporting the coins, movable jaws opposite the several spaces between the edges of adjacent coins, and means for pressing one of the jaws into such space and retracting the toe to discharge the coins below such jaw, substantially as herein set forth.

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

HENRY H. FOX.

Witnesses:

W. H. VAN STERNBERGH,

BLANCHE NICHOLLS.