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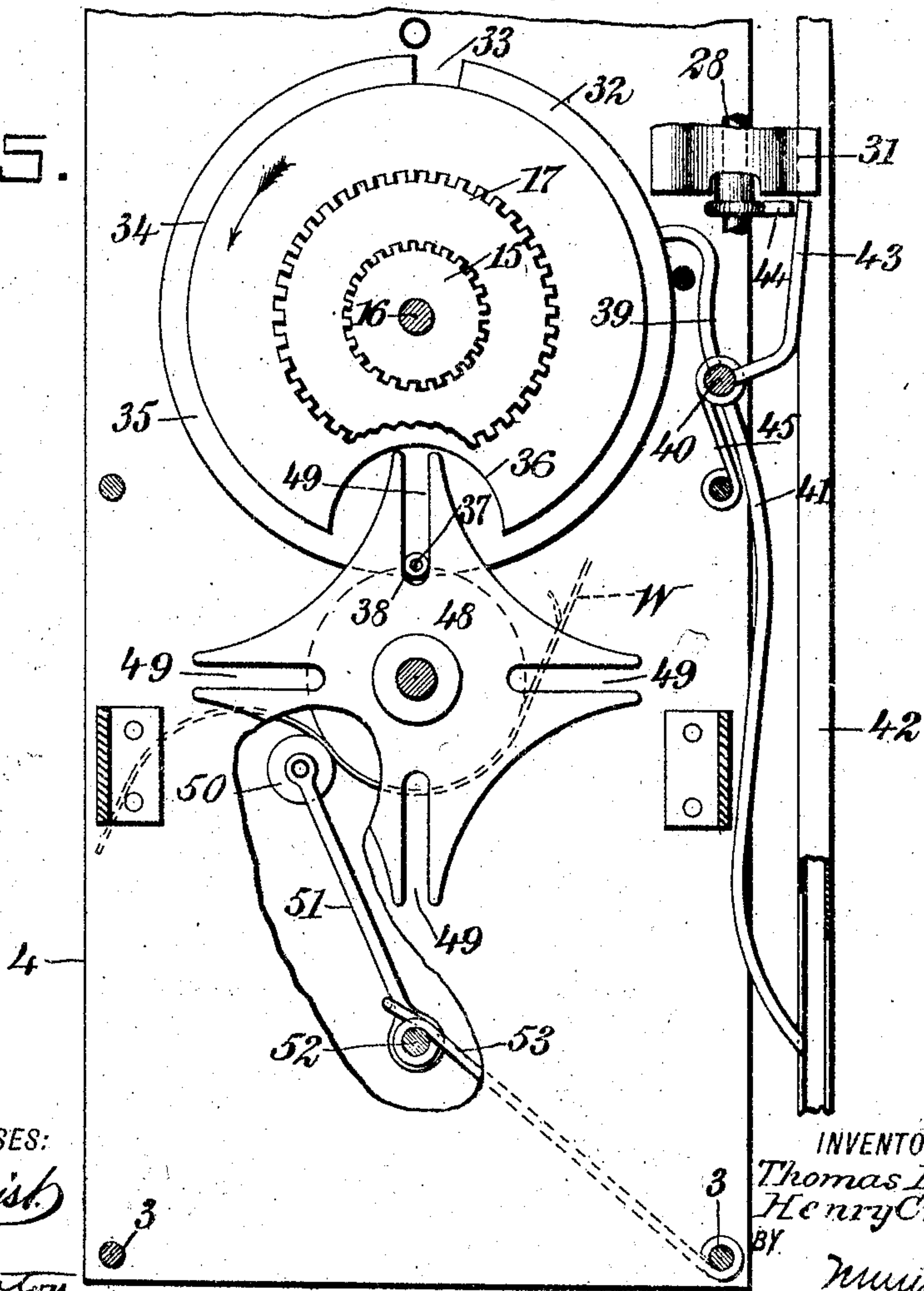
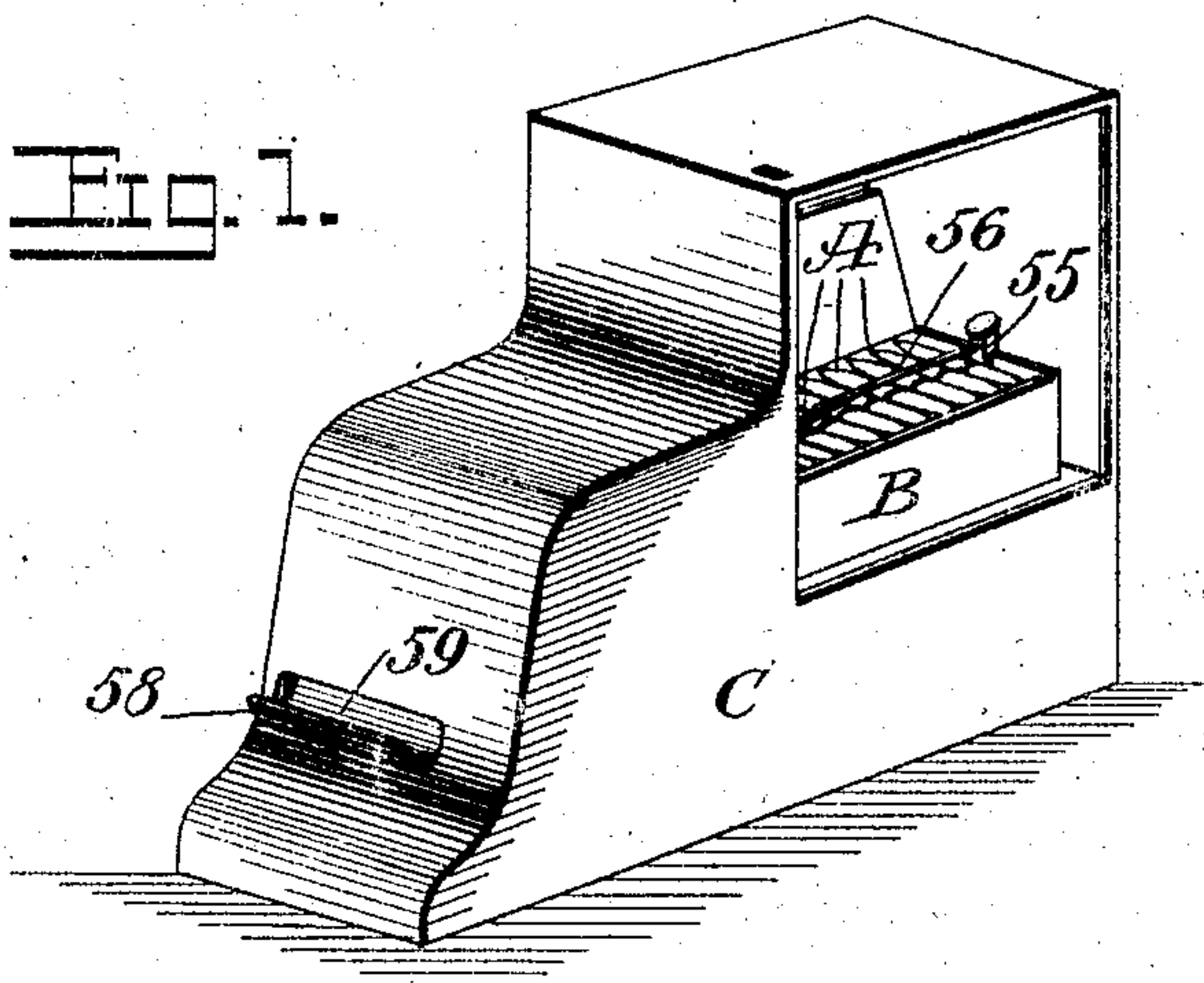
PATENTED APR. 4, 1905.

T. B. ERWIN & H. C. MEYER.

VENDING MACHINE.

APPLICATION FILED MAY 13, 1904.

4 SHEETS—SHEET 1.



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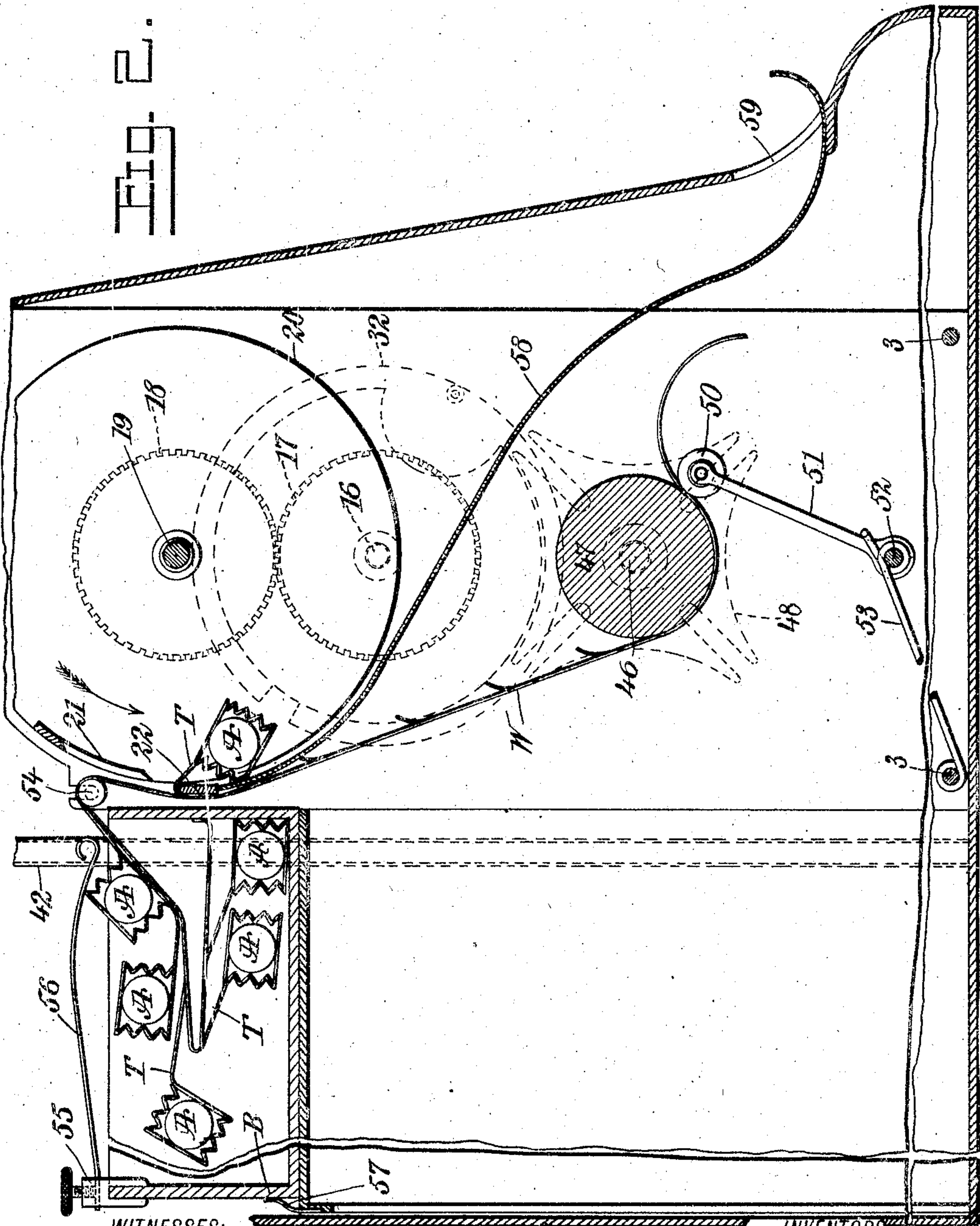
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4 SHEETS—SHEET 2.



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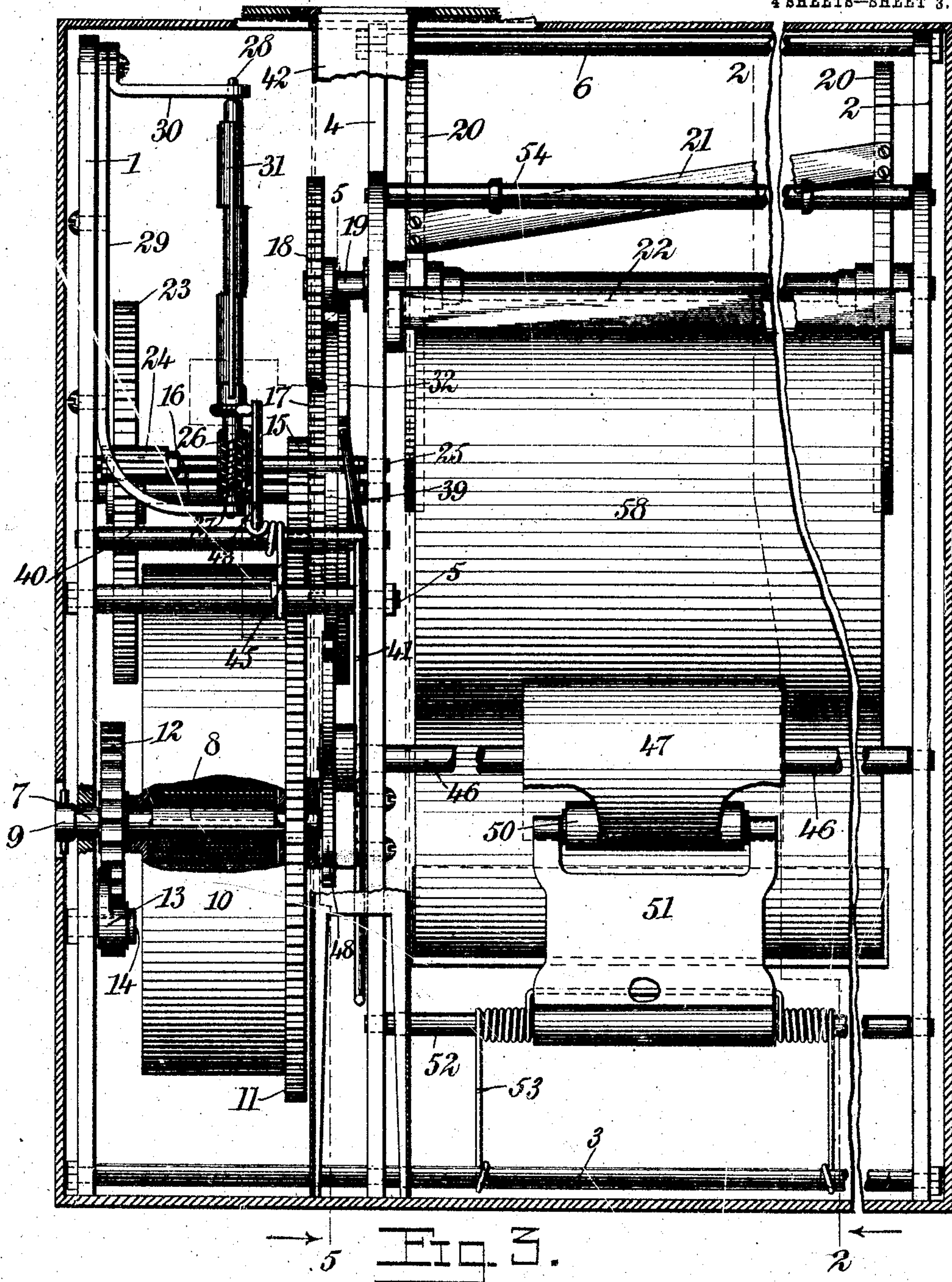
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4 SHEETS—SHEET 3.



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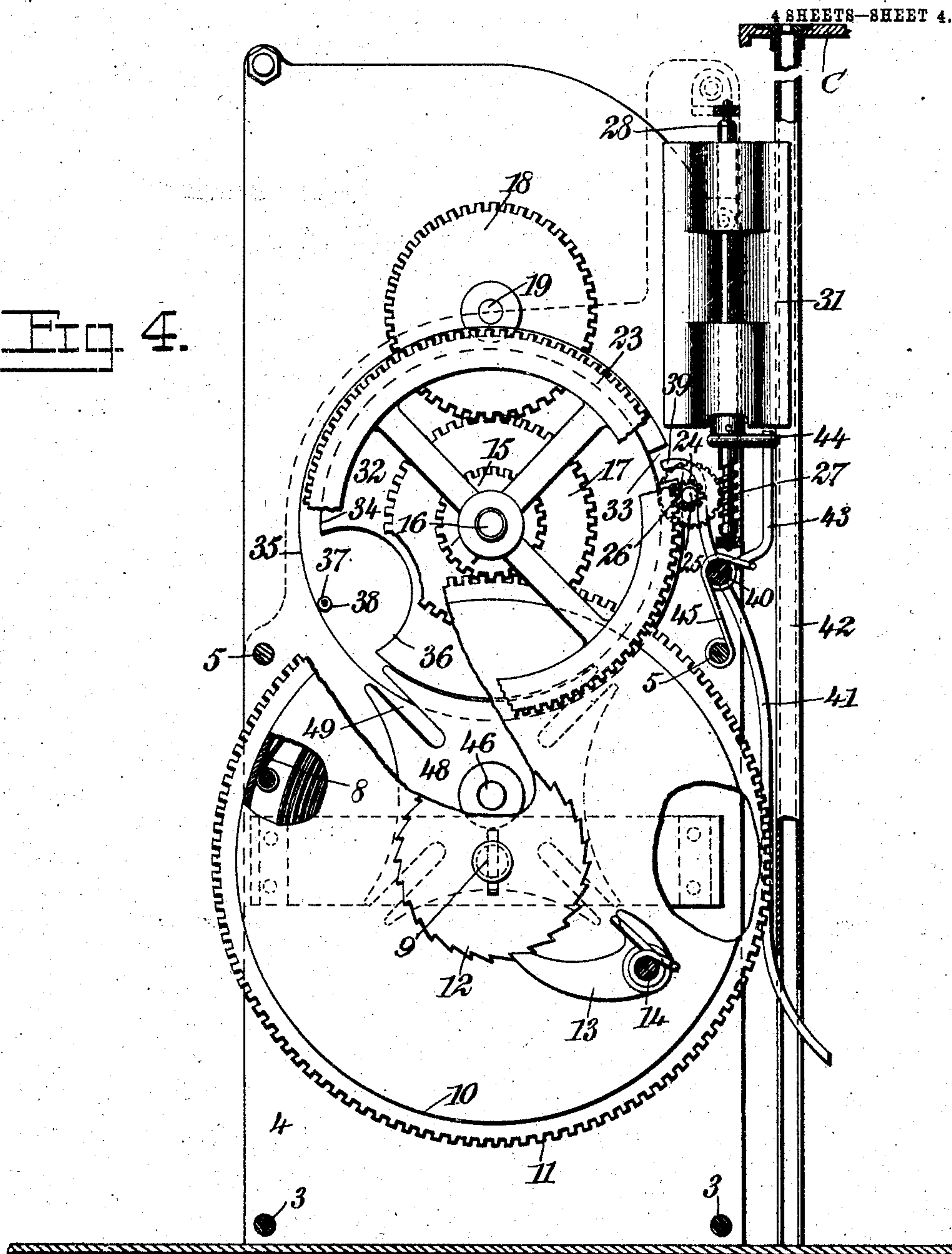
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4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS B. ERWIN AND HENRY C. MEYER, OF BRITT, IOWA.

VENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 786,741, dated April 4, 1905.

Application filed May 13, 1904. Serial No. 207,742.

To all whom it may concern:

Be it known that we, THOMAS B. ERWIN and HENRY C. MEYER, citizens of the United States, and residents of Britt, in the county of Hancock and State of Iowa, have invented a new and Improved Vending-Machine, of which the following is a full, clear, and exact description.

This invention relates to machines for vending small articles; and it has reference more particularly to vending-machines of the type in which the articles sold are attached at intervals to a flexible web or strip which is drawn through the machine as the machine is operated and from which the articles are detached one by one and discharged from the machine.

The present invention contemplates the production of a simple, inexpensive, and reliable machine of the type above specified which is so constructed that it will be impossible for persons to obtain articles from the machine by fraudulent means and which will not be readily rendered inoperative by the derangement of the interior mechanism thereof.

In order to make the nature of the invention clear to persons skilled in the art to which it pertains, we will describe the same as embodied in a machine for vending cigars from a box or other receptacle in which the cigars are packed in separate holders, which are attached at intervals of equal length to a flexible web or strip, preferably of paper; and the novel features of the invention will be clearly pointed out in the appended claims. It is, however, to be understood that the invention may be embodied in machines for vending other articles, and we do not limit ourselves to the exact structure described, but reserve the right to embody the invention in mechanism coming within the scope of the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of a com-

plete machine embodying the present invention, one side of the casing of the machine being open to disclose the receptacle containing the articles to be sold. Fig. 2 is a sectional view upon the line 2 2 of Fig. 3, the plane of the section extending longitudinally of the machine and following the irregular course indicated. Fig. 3 is a rear elevational view of the interior mechanism of the machine, parts being broken away. Fig. 4 is a side elevation of the mechanism, taken from the left of Fig. 3, the casing of the machine being removed and parts of the mechanism being broken away; and Fig. 5 is an elevational view on the same side as Fig. 4 and on the line 5 5 of Fig. 3 with some of the structures shown in Fig. 4 removed to show those lying behind them.

Referring to the drawings by the reference characters marked thereon, C designates the casing of the machine, which may of course be of any preferred contour and of any desired structure. In the form of the invention illustrated the casing of the machine is of such dimensions that space is provided therein behind the operating mechanism to receive a receptacle or box B of considerable size, within which the articles to be sold are packed and from which the said articles are removed by means of the web or strip to which they are attached.

Within the casing C there are arranged at opposite sides thereof two plates 1 and 2, which extend substantially to the top of the casing and are connected by transverse rods 3 near the bottom of each plate. Between the plates 1 and 2 and somewhat nearer to plate 1 is a third plate 4, which is connected with plate 1 by means of comparatively short rods 5 and with plate 2 by a longer rod 6, disposed between the top portions of the plates 2 and 4. These three plates 1, 2, and 4 form a supporting-standard for the operating mechanism of the machine, as will presently appear.

The main axle or shaft of the machine is indicated at 7 and is journaled in suitable bearings provided therefor in plates 1 and 4. This shaft has a spring 8 attached thereto at

its inner end and is provided with a key 9, by which the shaft or axle may be turned against the tension of the spring. The outer end of the spring 8 is secured within a spring-casing 10, which is attached to a driving pinion or gear 11, rigidly mounted upon the shaft 7. The unwinding of the spring is prevented by a ratchet-wheel 12, mounted on the shaft, and a spring-actuated pawl 13, mounted upon a stud 14 in the plate 1.

The driving-gear 11 meshes with a small pinion 15, fixed upon a shaft 16, journaled in bearings formed therefor in the plates 1 and 4. This shaft also bears a pinion or gear 17 adjacent to the pinion 15, which meshes with a pinion 18 of exactly the same size as the pinion 17 and having the same number of teeth thereon. The pinion 18 is mounted upon a shaft 19, journaled in bearings provided in the vertical plates 2 and 4. This shaft has rigidly mounted thereon between the plates 2 and 4 a pair of disks 20, which afford support for a revolving knife 21, which is attached at its ends to the peripheries of the said disks and is disposed somewhat obliquely with reference to the shaft 19, as best seen in Fig. 3. The knife 21 coöperates with a fixed knife 22, supported between the plates 2 and 4 and presenting an edge parallel to the shaft 19, so that when the knife 21 coöperates with the fixed knife 22 to perform a cutting operation the two knives have a shearing action.

The shaft 16, to which the pinion 15 is attached, is provided at the end opposite the pinion 15 with a tolerably large gear 23, which meshes with a small pinion 24, fixed upon a shaft 25, disposed between the plates 1 and 4. The shaft 25 also bears a small worm wheel or gear 26, which engages with a worm 27 upon a vertical shaft or rod 28, which is rotatably mounted in brackets 29 and 30, supported upon the plate 1, as best shown in Fig. 3. Above the worm 26 the shaft 28 bears a fan 31, the utility of which will presently appear.

On the shaft 16 adjacent to the pinion 17 is a blank-wheel 32 of the form best shown in Fig. 5. The blank-wheel 32 is provided at its periphery with a notch 33, and it is preferably circumferentially rabbeted at 34 to present a marginal portion 35 of less thickness than the central portion of the wheel, and in this marginal portion the notch 33 is formed. Substantially opposite the notch 33 a semicircular recess 36 is formed in the thickened portion of the wheel, and in the marginal portion midway between the sides of the recess a pin 37 is set to project at right angles to the face of the blank-wheel. The pin 37 is preferably provided with a roller 38, which is freely rotatable thereon.

The recess 33 in the marginal portion of the blank-wheel 32 is provided for the engage-

ment of a detent 39, which consists, preferably, of a bent arm rigidly attached to a shaft 40, which is mounted between the plates 1 and 4. The same shaft bears a longer arm 41, which extends downward and rearward and when in its normal position intercepts a coin-guide 42, but may be forced forward by the passage of a coin through the guide, and this movement of the arm 41 when a coin passes through the guide turns the shaft 40 sufficiently to lift the detent 39 out of the notch 33 in the margin of the wheel 32. Upon the shaft 40 there is mounted another arm 43, which is adapted for engagement with an arm 44, rigidly attached to the vertical rod or shaft 28, bearing the fan 31. A spring 45, wound upon the shaft 40 and having one end caught against the rod 5, tends to hold the detent 39 normally in engagement with the notch 33 and to hold the detent 43 normally in engagement with the arm 44 on the fan-shaft.

A shaft 46, journaled in bearings formed in the plates 2 and 4 and disposed considerably below the shaft 16, is provided with a roller 47, which receives the web to which the articles to be sold are attached, and this shaft 46 has mounted on the end thereof in position to be engaged by the stud 37 and roller 38 a star-wheel 48, which is preferably provided with four arms, each of which has a radially-disposed slot 49 formed therein and extending inward from the tip of the arm. The proportions of the wheel 48 are such that when the stud 37 and roller 38 enter one of the slots 49 the arm in which said slot is formed will turn in the recess 36, formed in the thickened portion of the blank-wheel 32.

To coöperate with the roller 47 in feeding the article-carrying web forward through the machine, a presser-roller 50 is rotatably mounted in an arm 51, mounted upon a transverse rod 52, supported in the plates 2 and 4. The roller 50 is kept normally in contact with the winding-roller 47 by a spring 53, which is preferably wound on the rod 52 and has the ends thereof caught on one of the rods 3.

The arrangement of the articles to be vended within the machine may be readily seen from an inspection of Fig. 2, in which the web W, to which the articles are attached, is shown with the forward end thereof passed between the rollers 47 and 50, the remainder of the web extending upward behind the stationary knife 22, over a guide-roller 54, and thence downward and rearward into the box B or other receptacle in which the articles A (in this instance cigars) are packed before introduction into the machine. In order to keep the web W under proper tension to insure the satisfactory operation of the machine, a clamp 55 is mounted upon one of the sides of the box B, and a spring 56, secured

by the clamp, extends forward into proximity to the front wall of the box, so that as each article passes upward and forward in leaving the box it must contact with the free end of the spring 56 and raise the spring slightly prior to its passage over the front wall of the box.

The operation of the machine will be readily understood from the foregoing description and from the drawings illustrative thereof. The box containing the articles to be sold packed in the manner above described will be introduced into the casing of the machine, in which it is held stationary by a small spring 57 or other suitable device. The web W, to which the articles are attached by separate tabs T, which are bent over to form holders for the articles, will be passed forward over the guide-roller 54 and thence downward behind the stationary knife 22 to the feed or winding roller 47, under which the web will be passed, so that it may be engaged by the presser-roller 50. The spring 8, from which power is obtained to operate the vending mechanism, will then be wound by means of the key 9, and the machine will be ready for operation. When a coin is dropped downward through the coin-guide 42, it will strike the end of the arm 41, which intercepts the guide near the bottom, and the momentum of the coin will be sufficient to force the arm out of the guide, so turning the shaft 40 sufficiently to lift the detent 39 out of the recess 33 in the blank-wheel 32. As soon as the detent 39 is lifted out of the recess 33 the blank-wheel will be free to turn under the impulse of the spring 8, transmitted through the gearing connecting the shaft 7 with the blank-wheel shaft, and at the same time motion will be imparted from the blank-wheel shaft to the shaft 19, which carries the revolving knife 21. Shortly after the movement of the blank-wheel 32 begins the stud 37 and roller 38 thereon will engage with one of the slots 49 in the star-wheel 48, which is normally in the position shown in Fig. 4. The engagement of the stud 37 and roller 38 with the star-wheel will cause a partial rotation of the star-wheel. In the form of the invention illustrated the star-wheel is constructed to turn through an angle of ninety degrees at each revolution of the blank-wheel. The partial rotation of the star-wheel will impart a similar partial rotation to the feed-roller 47, which is of such dimensions that a quarter-revolution thereof will draw the web W forward a distance equal to the interval between two adjacent tabs T, by which the articles to be sold are attached to the web. The motion of the star-wheel 48 continues during less than one-quarter of the revolution of the blank-wheel 32, so that before the knife 21, which makes a revolution in the same time that the blank-wheel 32 makes its revolution, reaches

the stationary knife 22 the web W will have ceased to move forward. At each forward movement of the web W one of the articles A will pass over the guide-roller 54, which is disposed directly above the stationary knife 22, and as an article passes over the guide-roller its weight will cause it to fall forward and downward, so that by the time the movement of the web W ceases the tab T, by which the article is attached to the web, will hang over the edge of the knife 22, as shown in Fig. 2. Consequently when the knife 21 passes the fixed knife 22 it will sever the tab T and detach the article from the web. As soon as the article is detached by the severance of the tab it will pass downward and forward to the front of the casing along a removable apron 58, which extends from the under side of the knife 22 downward and forward through an opening 59 in the front of the casing C.

In the operation of the machine as above described the fan 31 serves as a brake or regulator to prevent the machine from operating with such rapidity when the spring 8 is tightly wound as to cause the web W to be drawn too rapidly over the guide-roller 54 and to become slack between the guide-roller and the feed-roller 47. The fan acts as a sort of escapement and insures an approximate uniformity of speed in operation, whether the motor-spring 8 be completely or only partially wound.

From the description of the construction and operation of the machine forming the present invention it will be readily seen that the mechanism is of such character that it can be readily constructed at relatively small expense and that the articles will be delivered with certainty one by one as the mechanism is actuated.

The machine is especially adapted for the vending of cigars and other fragile articles, because very little pressure is ever brought to bear upon an article in its course from the receptacle in which it is packed through the machine to the purchaser. Moreover, there is no way in which the machine can be tilted, turned, or otherwise manipulated by a dishonest person to effect the removal of the contents of the machine by fraudulent means.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination in a vending-machine, of a fixed cutter, a web-feeding mechanism for feeding a web at one side of the body of the said cutter and in close proximity thereto, and a movable cutter operating in conjunction with the fixed cutter, whereby articles attached to the web by tabs will fall over the edge of the fixed cutter in the travel of the web and the tabs connecting the articles severed from the web.

2. The combination in a vending-machine, of a fixed cutter, a movable cutter operating in conjunction with the fixed cutter, a web having articles attached thereto by tabs, and
5 a web-feeding mechanism for feeding a web in close proximity to and at one side of the body of the fixed cutter, as and for the purpose set forth.

3. The combination in a vending-machine,
10 of a fixed cutter, a movable cutter operating in conjunction with the fixed cutter, a web having articles attached thereto by tabs, a web-feeding device arranged below the fixed cutter, and a web-guide arranged above the
15 fixed cutter, whereby the web will be fed at one side of and in close proximity to the fixed cutter, as set forth.

4. The combination in a vending-machine, of a web having articles attached thereto by
20 separate tabs, means for feeding the web, means for moving one of said articles out of contact with the web during each feed movement of the web, and mechanism for severing the tab of the article after the article is
25 moved out of contact with the web.

5. The combination in a vending-machine, of a web having articles attached thereto by tabs, means for intermittently feeding the web, mechanism for severing the tabs from
30 the web, and a spring adjacent to said web and adapted to engage the articles carried thereby to keep the web under proper tension.

6. The combination in a vending-machine,
35 of a web having articles attached thereto upon one side by tabs, means for feeding the web, a fixed knife adjacent to which the web travels, and a movable knife cooperating with said fixed knife to sever articles from
40 said web.

7. The combination in a vending-machine, of a web having articles attached thereto, means for feeding the web, a fixed knife disposed transversely of said web and in the
45 rear of which the web travels, and a movable knife disposed obliquely to the line of travel of the said web and cooperating with the fixed knife to shear articles from the web.

8. The combination in a vending-machine,
50 of a web having articles attached thereto, means for feeding the web, a fixed knife disposed transversely of the web and in the rear of which the web travels, and a revolving knife disposed obliquely to its axis and cooperating
55 with the fixed knife to shear articles from the web.

9. The combination in a vending-machine, of a web having articles attached thereto by tabs, a web-feeding mechanism, a guide-
60 roller over which the web is adapted to pass, a fixed knife disposed substantially beneath said guide-roller and spaced therefrom, be-

hind which the web is adapted to pass, and a movable knife cooperating with the fixed knife to sever the tabs carrying the articles
65 from the web.

10. The combination in a vending-machine, of a guide-roller, a fixed knife disposed substantially beneath the guide-roller, a feed-roller disposed below and in front of
70 said fixed knife, and a revolving knife cooperating with the fixed knife.

11. The combination in a vending-machine, of a receptacle, a guide-roller disposed adjacent to the receptacle, a spring extending above the receptacle and terminating
75 adjacent to the guide-roller, severing devices beneath the guide-roller behind which a web is adapted to pass, and web-feeding devices disposed in front of the said severing devices.
80

12. The combination in a vending-machine, of web-feeding devices, a star-wheel connected with said web-feeding devices to impart movement thereto, a blank-wheel bearing a stud adapted to engage said star-
85 wheel during a portion of each revolution of the blank-wheel, and article-detaching devices connected with said blank-wheel and operative during the entire revolution of the blank-wheel.
90

13. In a vending-machine, the combination of a web-feeding means, a star-wheel connected with the web-feeding means for imparting movement thereto, a blank-wheel bearing a stud adapted to be engaged by the
95 star-wheel during a portion of each revolution of the blank-wheel, a cutting device, consisting of a fixed cutter and a revoluble cutter, and means for operating the revoluble cutter from the blank-wheel.
100

14. In a vending-machine, the combination of a motor, an intermittently-operated web-feeding mechanism, a cutting device comprising a fixed cutter and a revoluble
105 cutter, and means for operating the revoluble cutter, the means for feeding the web and the means for operating the revoluble cutter being so timed that the cutting will take place when the web is at rest.

15. In a vending-machine, the combination of a motor, a web-feeding means intermittently operated by the motor, a cutting device comprising a fixed cutter and a revoluble
110 cutter, and means for operating the revoluble cutter from the motor to cause the cutting to take place when the web is at rest.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS B. ERWIN.
HENRY C. MEYER.

Witnesses:

W. B. FRITZE,
E. M. BURGITT.