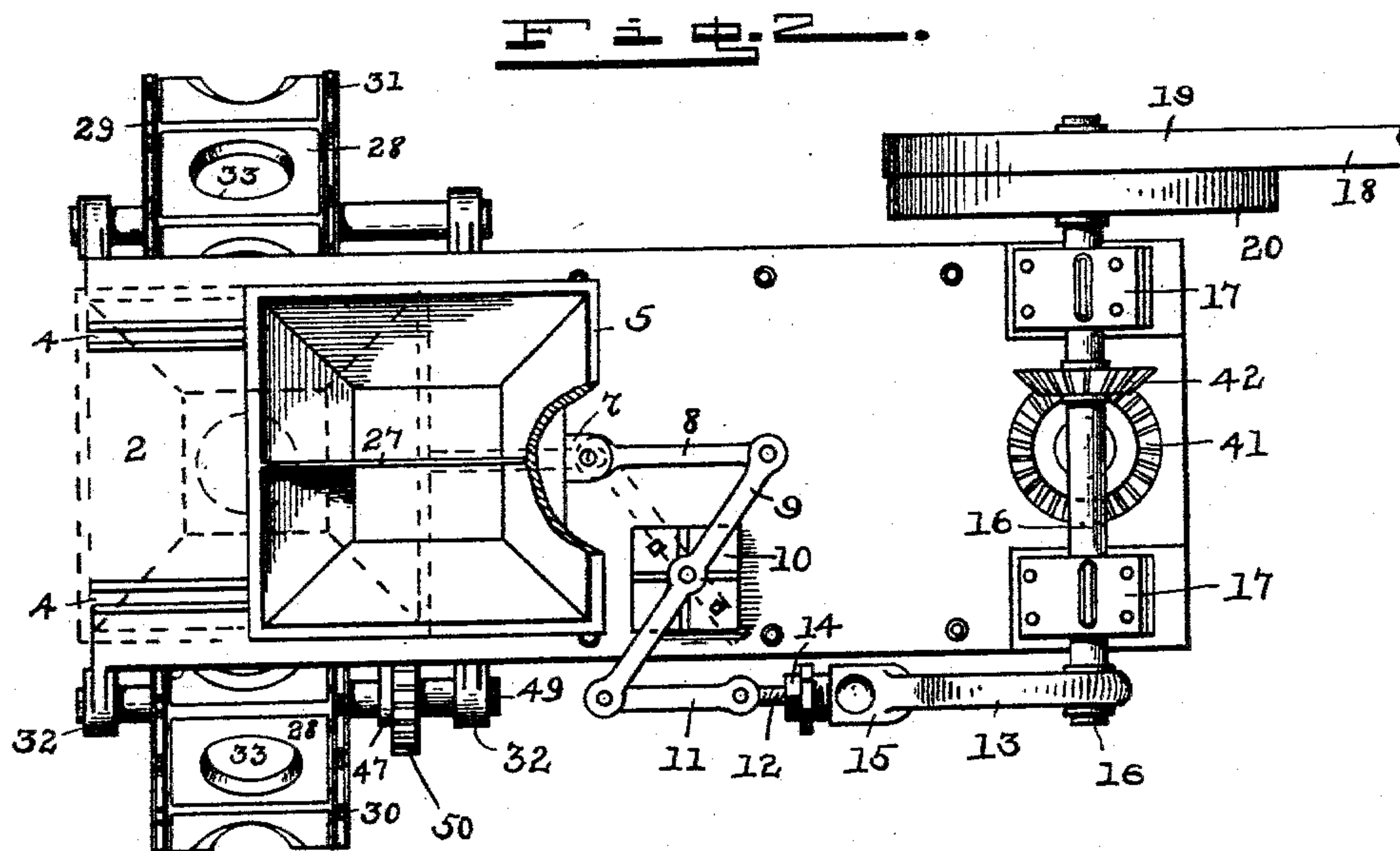
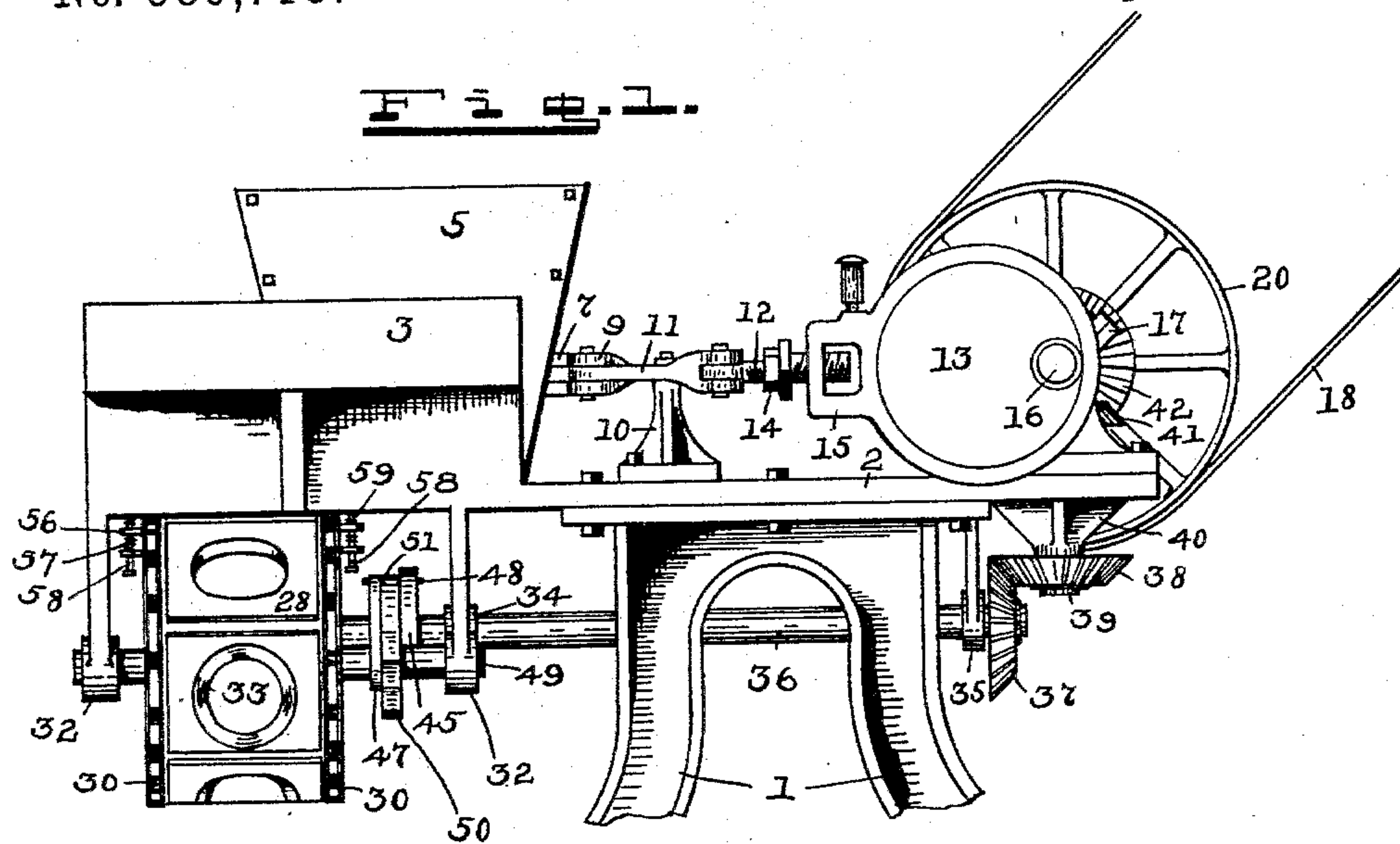


2 Sheets—Sheet 1.

No. 589,718.

Patented Sept. 7, 1897.



INVENTOR

F. H. Hoerner.
Gula Green

Thomas L. Green
BY
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His ATTORNEY.

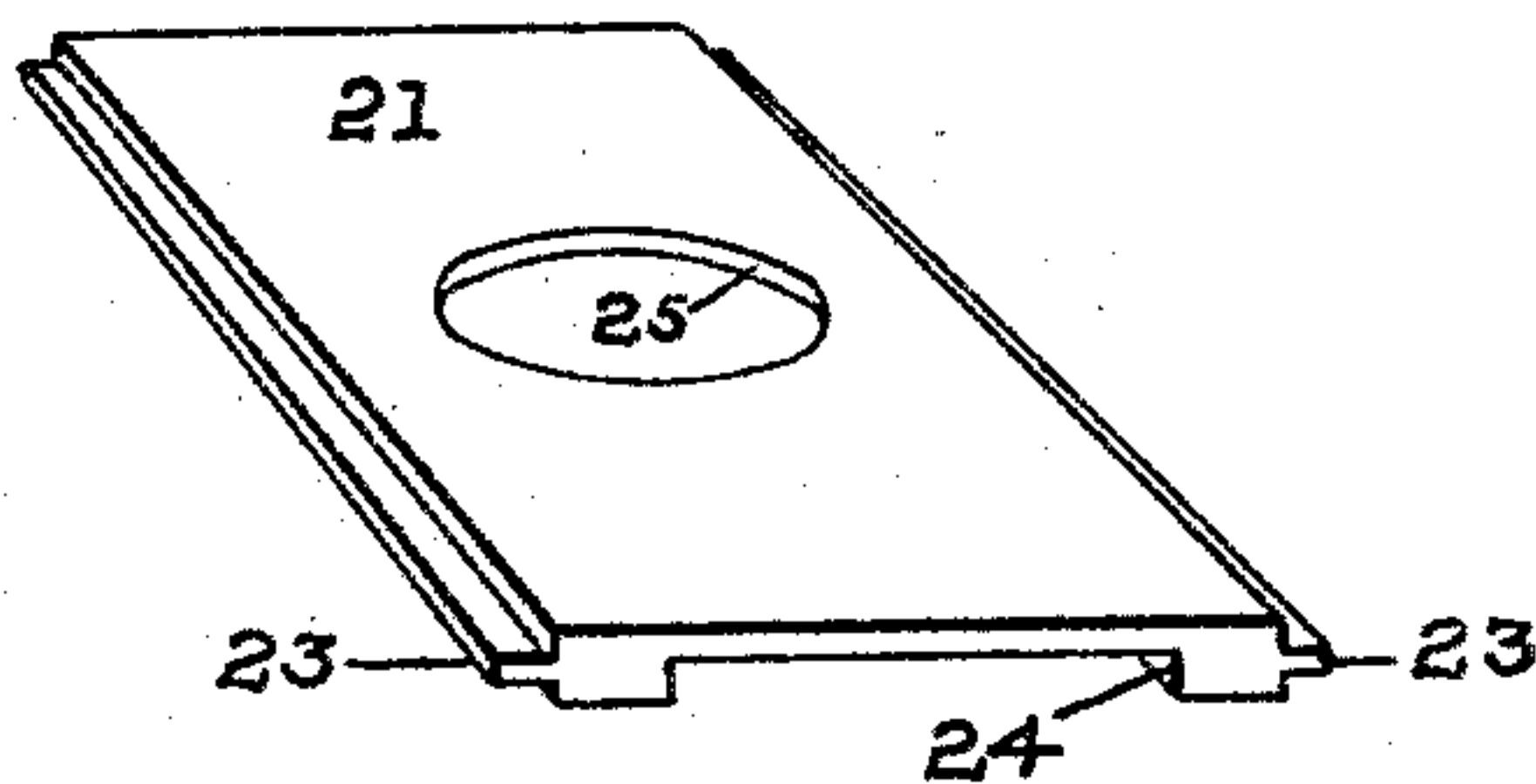
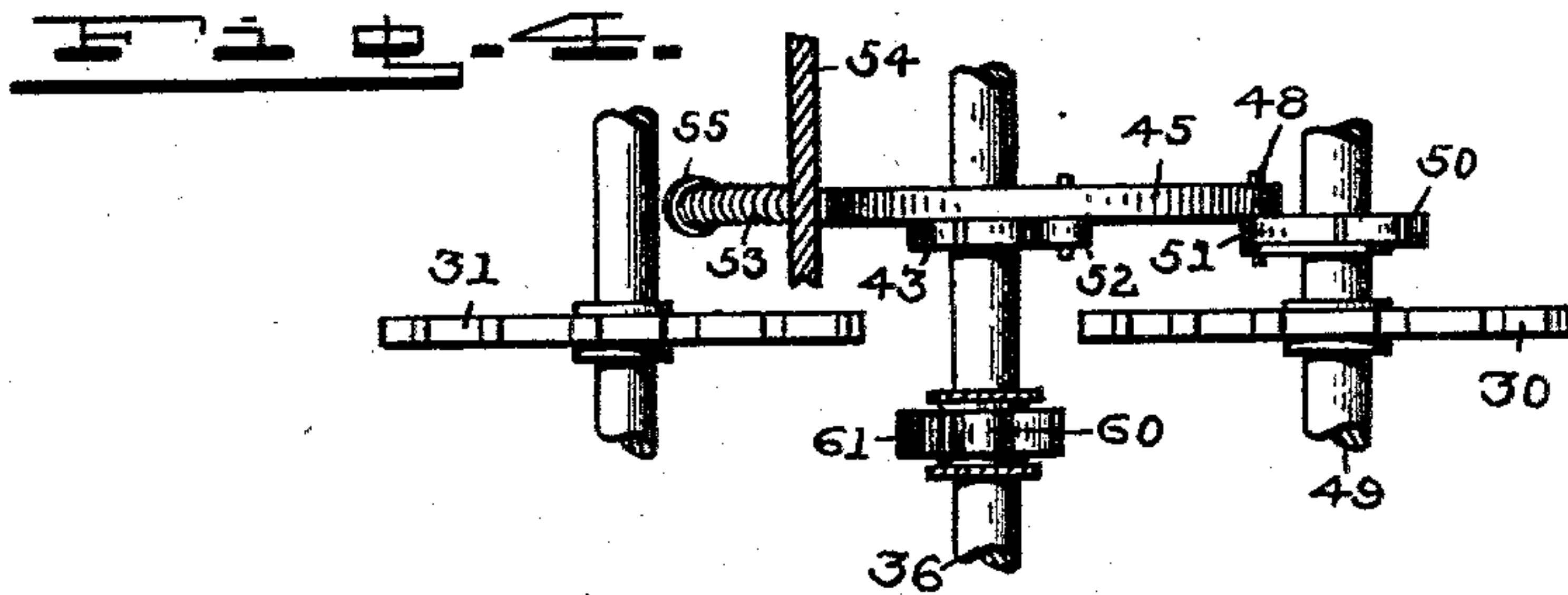
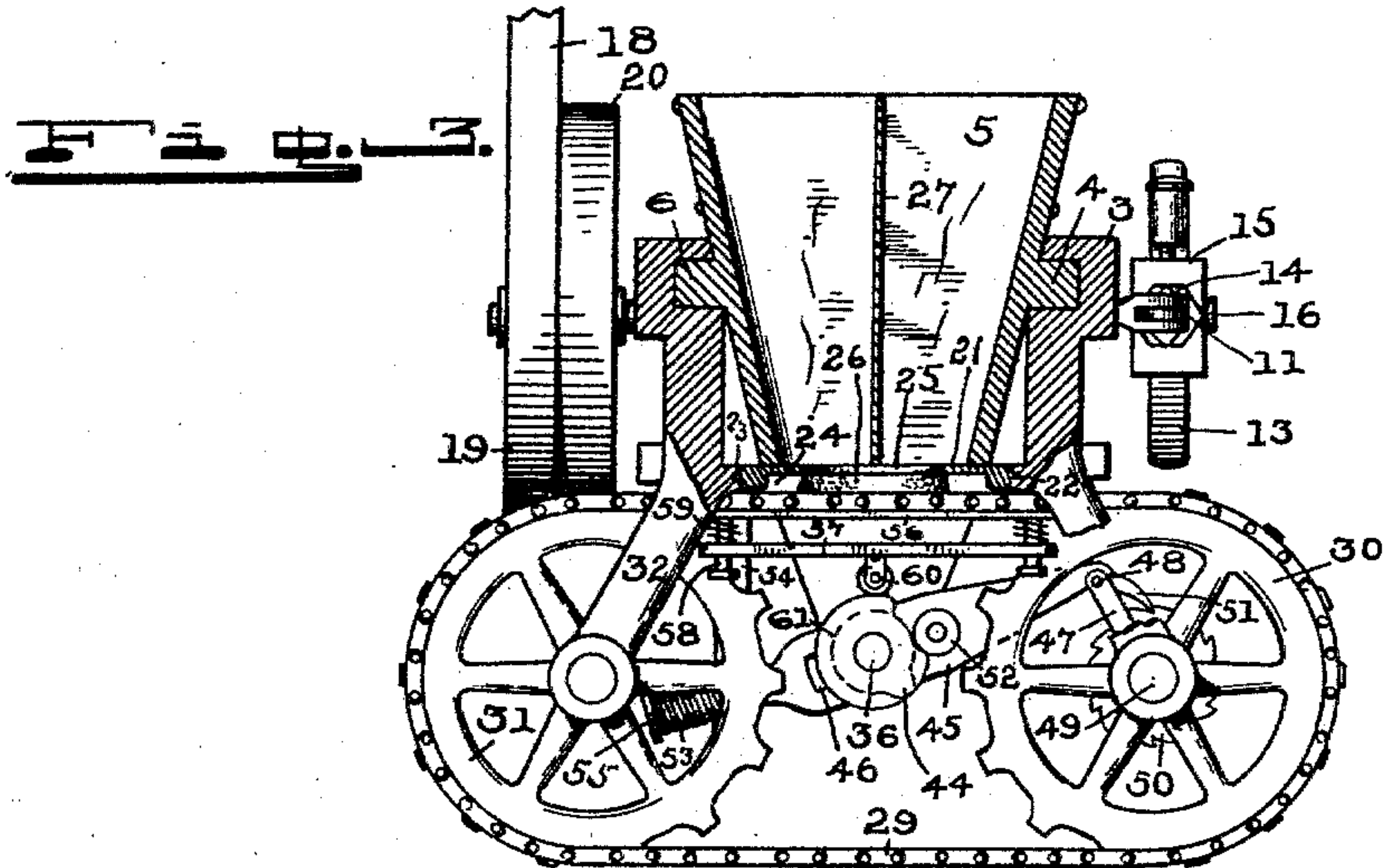
(No Model.)

2 Sheets—Sheet 2

T. L. GREEN.
MACHINE FOR ICING CAKES.

No. 589,718.

Patented Sept. 7, 1897.



Witnesses

F. W. Koerner.
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UNITED STATES PATENT OFFICE.

THOMAS L. GREEN, OF INDIANAPOLIS, INDIANA.

MACHINE FOR ICING CAKES.

SPECIFICATION forming part of Letters Patent No. 589,718, dated September 7, 1897.

Application filed October 7, 1896. Serial No. 608,167. (No model.)

To all whom it may concern:

Be it known that I, THOMAS L. GREEN, of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Machines for Icing Cakes, Candies, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

My invention relates to a machine for icing cakes, candies, and similar articles whereby any desired design or combination of colors may be given the icing.

My machine also embodies a device for automatically feeding cakes to the icing portion of the machine.

The object of this icing-machine is to be certain and positive in its action in placing the icing on the cakes. It places as much thereon as needed every time the machine operates and cannot place more nor less. Furthermore, all parts of the design are uniformly worked out and made by the machine. The icing is deposited on the cake by gravity, the portion adjacent to the cake being forced down by the weight of the icing above it in the hopper. The icing thus deposited is struck off by the lower edge of the hopper, so that it will always be level and uniform in thickness.

This machine is adapted, preferably, to deposit the icing after the cake or cracker is baked, and to prevent the danger arising from placing the cakes in position under the hopper by hand I have invented an automatic feed mechanism in which the cakes can be readily placed without danger and which will carry them singly or in groups and hold them beneath the die long enough to receive the icing and will then remove the cake and deposit it in a suitable receptacle on the other side of the machine, or they may be removed from the machine by hand with safety.

The details of the form and mechanical construction of the various parts of the machine may be modified as mechanical skill would suggest, but I here show and describe the construction and form which I have found preferable.

Figure 1 is a side elevation of the machine

with the lower portion of the framework broken away. Fig. 2 is a plan view of the machine. Fig. 3 is a front elevation of the machine with the hopper and adjacent portions in cross vertical section. Fig. 4 is a plan view of the parts of the machine, looking down from the line A A of Fig. 1. Fig. 5 is a perspective view of the die.

In detail the construction I have found preferable consists of a suitable frame 1, extending from the floor to a position about as high as an ordinary table to make the machine convenient for operation. Upon this frame I secure a bed-plate 2, provided on each side with an ordinary wall or plate 3. In the opposing faces of the pair of ordinary walls or plates 3 I provide a horizontal guideway at 4. This arrangement is to provide for the reciprocation of the hopper 5. It has on each side a horizontal rib 6, adapted to slide in the guideway 4, as seen in Fig. 3.

The means for the reciprocation of the hopper 5 comprises a pair of lugs 7, secured to the rear portion of the hopper. Between these there is pivoted a link 8, whose other end is pivoted to one end of the lever 9, which is centrally mounted on the post 10. The post is vertical and the centrally-pivoted lever 9 horizontal. To the other end of such centrally-pivoted lever 9 there is pivoted a second link 11. This latter link is connected by a screw-bolt 12 to the eccentric 13. The screw-bolt 12 is provided with a nut 14, and the bolt screws into a bracket 15 on the eccentric, whereby such connection between the eccentric and link 11 may be adjusted and thereby adjust the limit of movement of the hopper to suit different sizes of designs in the die.

The eccentric 13 is mounted on a horizontal shaft 16, carried in the bearings 17, that are placed on the rear portion of the bed-plate 2. This shaft 16 is driven by a belt 18, that extends from some suitable source of power and surrounds the pulley 19, secured to the shaft 16. Beside such pulley I provide an idler 20 for throwing the machine out of gear. Instead of this means any other well-known mechanism, such as a clutch, for throwing the machine in and out of gear may be provided, as desired.

The hopper contains the icing to be depos-

ited on the cake. It is a frustum of a rectangular cone inverted. It has no bottom and reciprocates or slides upon the die 21. The forward portion of the bed-plate 2 is cut out to receive the die. The side edges of the cut-out portion of the bed-plate are provided with longitudinal grooves 22 to receive the ribs 23 along the edges of the die, whereby the die is slipped into its place beneath the hopper.

The die is centrally recessed at 24 on its under side, as shown in section in Fig. 3, making the portion of the die beneath the hopper as thin as the strength of the material will permit, but with this construction the thick strong portion of the die near the edges and about the recessed portion give to the die additional strength. The object of making the portion of the die thin beneath the hopper is to permit the easy escape of the icing from the die as the cake is being removed. The icing, as has been stated, is contained in the hopper 5 and is forced through a suitable opening or design 25 in the die, as seen in Figs. 2, 3, and 5. In Fig. 3 the cake 26 is shown in section beneath the opening 25 in the die. The form of this opening may be such as desired. In Figs. 2 and 3 I have shown a round opening substantially the size of the cake whereby the whole upper surface of the cake may be iced, but it is clear that when any design or letters are desired to be iced on the cake it can be done by forming suitably-shaped openings in the die. To facilitate the ready and successful removal of the icing from the die as the cake is being removed, I incline or bevel the sides of the openings in the die, so that the width of the opening will be greater below than above.

To give various colors to the ice, I divide the hopper into compartments by means of the partition 27, and this may be multiplied according to the number of colors desired. After the cake has been placed beneath the design in the die and the hopper has been filled with icing it is moved over the design in the die, as shown in dotted lines in Fig. 2, whereupon the weight of the icing will cause the lower portion of it to be pressed down through the design in the die and upon the cake. Then the hopper is moved backward away from the design in the die and in such movement the lower edge of the forward wall of the hopper will cut off the icing so as to leave a layer of it on the cake equal only in thickness to the thickness of the die above the cake. It is preferable that the throw of the hopper be so adjusted by setting the screw-bolt 12 that the lower edge of the forward side of the hopper will not pass in the forward movement much beyond the design in the die. The hopper must go far enough to permit the icing to be deposited on the cake, but no farther. The purpose of this is to enable the lower edge of the front side of the hopper to make a clean cut of the icing at the commencement of the rearward movement of the

hopper. If the hopper is permitted to go forward rather far beyond the opening in the design, there is danger that in the rearward movement of the hopper the icing on the front portion of the cake might be pulled off by the affinity between the particles of icing that should be left on the cake and of that which should be left in the hopper.

If one desires, he may hold the cake in position beneath the design in the die, but if the aperture forming the design be large enough to admit a finger the lower edge of the hopper might amputate it. To avoid this difficulty and to make the feeding of the machine easy, I have invented the following feed mechanism: I connect a series of feed-plates 28 with a pair of sprocket-chains 29. The plate at each of its four corners is pivoted loosely to the sprocket-chains. The sprocket-chains are carried on sprocket-wheels 30 and 31, there being a pair on each side of the machine carried in the depending arms 32, that extend from the bed-plate 2. These sprocket-wheels are so placed that the plates connected with the sprocket-chains will be carried beneath the design in the die. The plates are so formed as to receive and hold a cake or other thing to be iced. I have shown a round conically-formed seat 33 in the plate of the size and form to receive and hold an ordinary small cake or biscuit. It is observed that this series of feed-plates extend out on either side of the machine, so that a person can place the cakes on the feed-plates before they pass beneath the machine and after they come from beneath the machine can remove them before they fall out of place.

It is obvious that while the ice is being placed the cake should be held for a short period of time in a stationary position. Therefore the series of plates must cease moving. After the icing has been placed the series of feed-plates must be moved far enough only to bring the next feed-plate in place. This intermittent feed is effected by the following mechanism: Beneath the machine I suspend in the brackets 34 and 35 a horizontal shaft 36. Such shaft is rotated through the bevel-gears 37 and 38. The latter is secured to a vertical shaft 39, that operates through the bearing-post 40 and extends up through the rear portion of the bed-plate 2, having on its upper end the horizontal bevel-gear 41, that meshes with the vertical gear 42 on the shaft 16. A cam-collar 43 is secured on the shaft 36 not far from its middle portion. This cam-collar has a tooth 44. The arm 45 rides loosely on the shaft 36 beside the cam-collar 43. It is centrally provided with a slot 46, through which the shaft extends, whereby the arm is permitted to have a limited longitudinal movement. The arm is held in place by a link 47, pivoted at one end to the pin 48, that is secured to the end of the arm 45 and loosely enveloping the shaft 49, which carries the pair of sprocket-wheels 30. A ratchet 50 is se-

cured on the shaft 49 and is engaged and actuated by the pawl 51, likewise pivoted on the pin 48 in the end of the arm 45. From this it is obvious that when the arm 45 is pushed forward it will, through the pawl 51 and ratchet 50 and shaft 49, actuate the sprocket-wheels 30 and thereby move the series of feed-plates step by step.

The arm 45 is moved forward to effect such movement of the feed-plates by the tooth 44 on the cam-collar 43 engaging the friction-wheel 52, pivoted on one side of the arm 45. The size and inclination of this tooth 44, as well as the size of the pawl and ratchet 51 and 50 and the sprocket-wheels, should be such that when the tooth 44 has pushed the arm 45 to its furthestmost forward limit the series of feed-plates will be moved sufficiently far to move one cake from beneath the design in the die and bring the next cake in proper place for treatment. After such movement has been effected the continued rotation of the cam-collar 43 causes the tooth 44 to escape from contact with the friction-wheel 52, and thus permit the rearward movement of the arm 45 until the shaft 36 and cam-collar 43 make another rotation. During this movement the hopper is being reciprocated and the cake is being iced. In order to withdraw the arm 45 after the series of feed-plates have been actuated, I provide a spiral spring 53 on the rear end of the arm 45 between the bracket 54, depending from the bed-plate of the machine, and the nut or head 55 on the rear end of such arm 45. This not only withdraws the arm 45, but keeps the friction-wheel 52 in constant engagement with the periphery of the cam-collar 43, whereby it may be actuated by the tooth 44 when the same has revolved into a position to engage such friction-wheel.

It is obvious that in order to make a proper deposit of icing upon the cake the latter should be held firmly against the lower side of the die, and to do this the cake must, when it has come in place beneath the design in the die, be elevated and held in place. This is not only necessary because of the recess on the under side of the die, but also because the series of die-plates connected with the sprocket-chains naturally sag between the sprocket-wheels. I therefore have provided the following mechanism to accomplish the above-mentioned work: I provide a pair of horizontal pressure-plates 56 and 57, held in place on the under side of the bed-plate by the screw-bolts 58. Between the upper plate 56 and the bed-plate, as well as between the two plates 56 and 57, I provide spiral springs 59. The upper one of these plates lies beneath the series of feed-plates as they pass beneath the die, and the tendency of the lower springs 59 is to force the feed-plate above the plate 56 upward into contact with the die. Since, however, the upward pressure of the springs might not be sufficiently positive, I place on the under side of the lower plate 57 a friction-

wheel 60, that is engaged by a cam-wheel 61, mounted on the shaft 36. The diameter of the cam-wheel 61 is sufficient to cause a considerable upward pressure of the plate 57. This upward pressure is through the lower series of springs 59 to the plate 56 and then to the feed-plate. While the cake is being removed and another brought under the design in the die, it is necessary that these pressure-plates should be permitted to drop down out of engagement. To effect this, I provide on one side of the cam-wheel 61 a depression, as seen in Fig. 3, for a small portion of its periphery. Therefore as the cam-wheel 61 rotates for a short portion of the time it permits the pressure-plates to drop down and for the major part of the time it presses such plates up for the purpose above mentioned. While in this upward pressure one of the plates 57 and 56 might suffice, it is obvious that by duplicating them and the spring 59 I secure a more sensitive arrangement.

Only one other thing should have attention called to it and that is that the cam-wheel 61 and the cam-collar 43 must be mounted on the shaft 36 in such relation to each other, or, in other words, with the tooth 44 and the depression on the cam-wheel 61 in such relation to each other, that the friction-wheel 60 will drop down into the depression in the wheel 61 at the same time that the tooth 44 is in engagement with the friction-wheel 52. By observing this feature of the construction I cause the pressure-plates 56 and 57 to be released simultaneously with the actuation of the series of feed-plates.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for icing cakes, candies, &c., a perforated die, means for holding the cake under the die, and an open-bottom hopper or receptacle for icing that is reciprocable on the die, whereby the icing will be deposited on the cake and be struck off at a uniform thickness, substantially as and for the purpose set forth.

2. In a machine for icing cakes, candies, &c., a die provided with a designed perforation, means for holding the cake under such design against the die, and an open-bottom hopper or receptacle for icing that is reciprocable on the die, substantially as and for the purpose set forth.

3. In a machine for icing cakes, candies, &c., a perforated die, means for holding the cake under the die, and an open-bottomed hopper or receptacle for icing that is reciprocable on the die, said hopper being divided into compartments, whereby different-colored icing may be deposited upon different parts of the cake, substantially as shown and described.

4. In a machine for icing cakes, candies, &c., a perforated die, means for holding the cake under the die, an open-bottom hopper or receptacle for icing that reciprocates on the

die, and means for adjusting the limit of movement of the hopper, whereby its striking-off edge will not move substantially beyond the design in the die, substantially as and for the purpose set forth.

5. In a machine for icing cakes, candies, &c., a perforated die, means for holding the cake under the die, a pair of guideways on the opposing sides of such die, an open-bottom hopper or receptacle for icing provided with flanges fitting in such guideways, a suitable driving-shaft, an eccentric mounted thereon, and an adjustable link-and-lever connection between the hopper and eccentric, whereby the former is reciprocated on the die, substantially as and for the purpose set forth.

6. In a machine for icing cakes, candies, &c., a framework provided with a pair of side pieces having in their opposing faces a guideway extending horizontally along the lower portion of them and another horizontal guideway along the upper portion thereof, a perforated die that slips into the guideways in the lower portion of such pieces, an open-bottom hopper or receptacle for icing provided with side ribs that fit loosely in the guideways in the upper portion of said side pieces, and means for reciprocating the hopper on the die so that the openings in the hopper and die will register with each other during a portion of the movement of the hopper, substantially as and for the purpose set forth.

7. In a machine for icing cakes, candies, &c., a die centrally recessed on its under side, a perforated design in the recessed portion of the die, and means for holding a cake against the die under the design, substantially as and for the purpose set forth.

8. In a machine for icing cakes, candies, &c., a die with a perforated design under which the cake is placed such die centrally recessed on its under side and the walls of the design-perforation beveled to make the width of the lower portion of the perforation greater than that of the upper portion, and an open-bottom hopper or receptacle for the icing that reciprocates on the die, substantially as and for the purpose set forth.

9. In a machine for icing cakes, candies, &c., a perforated die, means for depositing icing through the perforation upon a cake below, a series of feed-plates, and means for passing such feed-plates immediately beneath the die, whereby the cakes may be fed to the machine in succession, substantially as and for the purpose set forth.

10. In a machine for icing cakes, candies, &c., a perforated die, means for depositing icing through the perforation upon a cake below, a pair of sprocket-chains, a series of feed-plates pivoted on each side to the sprocket-chains, a pair of sprocket-wheels on each side of the machine over which said sprocket-chains pass and so located that the series of feed-plates will pass immediately beneath the

die, and means for driving the sprocket-wheels, substantially as and for the purpose set forth.

11. In a machine for icing cakes, candies, &c., a mechanism to feed the cakes to the machine beneath the die comprising a series of feed-plates secured on each side to a sprocket-chain, a pair of sprocket-wheels on each side of the machine to actuate such series of feed-plates, a ratchet mounted on one of the sprocket-wheel shafts, a rotary counter-shaft driven by suitable power, a cam-collar mounted thereon provided with a tooth or extended portion, an arm loosely mounted on the shaft so as to be longitudinally movable, means on the arm with which the tooth or extended portion of the cam-collar engages once each revolution, whereby the arm is propelled forward, a pawl on such arm to engage and drive the ratchet-wheel, and a spring to withdraw such arm when it is not propelled forward by the tooth on the cam-collar, substantially as and for the purpose set forth.

12. In a machine for icing cakes, candies, &c., means for depositing icing through the perforation upon the cake below, a series of feed-plates that pass immediately below the die to feed cakes to the machine, a vertically-movable plate over which such series of feed-plates move, and springs that tend to force such plate upward, whereby a cake is held in contact with the lower side of the die, substantially as and for the purpose set forth.

13. In a machine for icing cakes, candies, &c., a perforated die, means for depositing icing through the perforation upon a cake below, a series of feed-plates that pass immediately below the die to feed cakes to the machine, a vertically-movable plate over which such series of feed-plates move, and means for elevating such plate while the cake is being iced and of lowering the plate while the cake is being moved by the feed-plates, substantially as and for the purpose set forth.

14. In a machine for icing cakes, candies, &c., a perforated die, means for depositing icing through the perforation upon a cake below, a series of feed-plates that pass immediately below the die to feed cakes to the machine, a vertically-movable plate over which such series of feed-plates move, a second plate placed below the first, springs placed between such plates, a friction-wheel mounted on the underside of the lower plate, a cam-wheel that engages such friction-wheel having a depression in a portion of its periphery, and means for rotating such cam-wheel, substantially as and for the purpose set forth.

15. In a machine for icing cakes, candies, &c., a perforated die, means for depositing icing through the perforation upon a cake below, a series of feed-plates that pass immediately below the die and are pivoted on each side to a sprocket-chain, a pair of sprocket-wheels on each side of the machine by which

the sprocket-chains are moved, means for inter-
mittently driving such sprocket-wheels,
pressure-plates immediately below the die and
series of feed-plates, a cam-wheel so formed
5 as to engage and elevate such plates while
the sprocket-wheels are not being actuated
and that lowers the same while the sprocket-
wheels are being actuated, and means for ro-

tating such cam-wheel, substantially as and
for the purpose set forth.

In witness whereof I have hereunto set my
hand this 1st day of October, 1896.

THOMAS L. GREEN.

Witnesses:

V. H. LOCKWOOD,
ZULA GREEN.