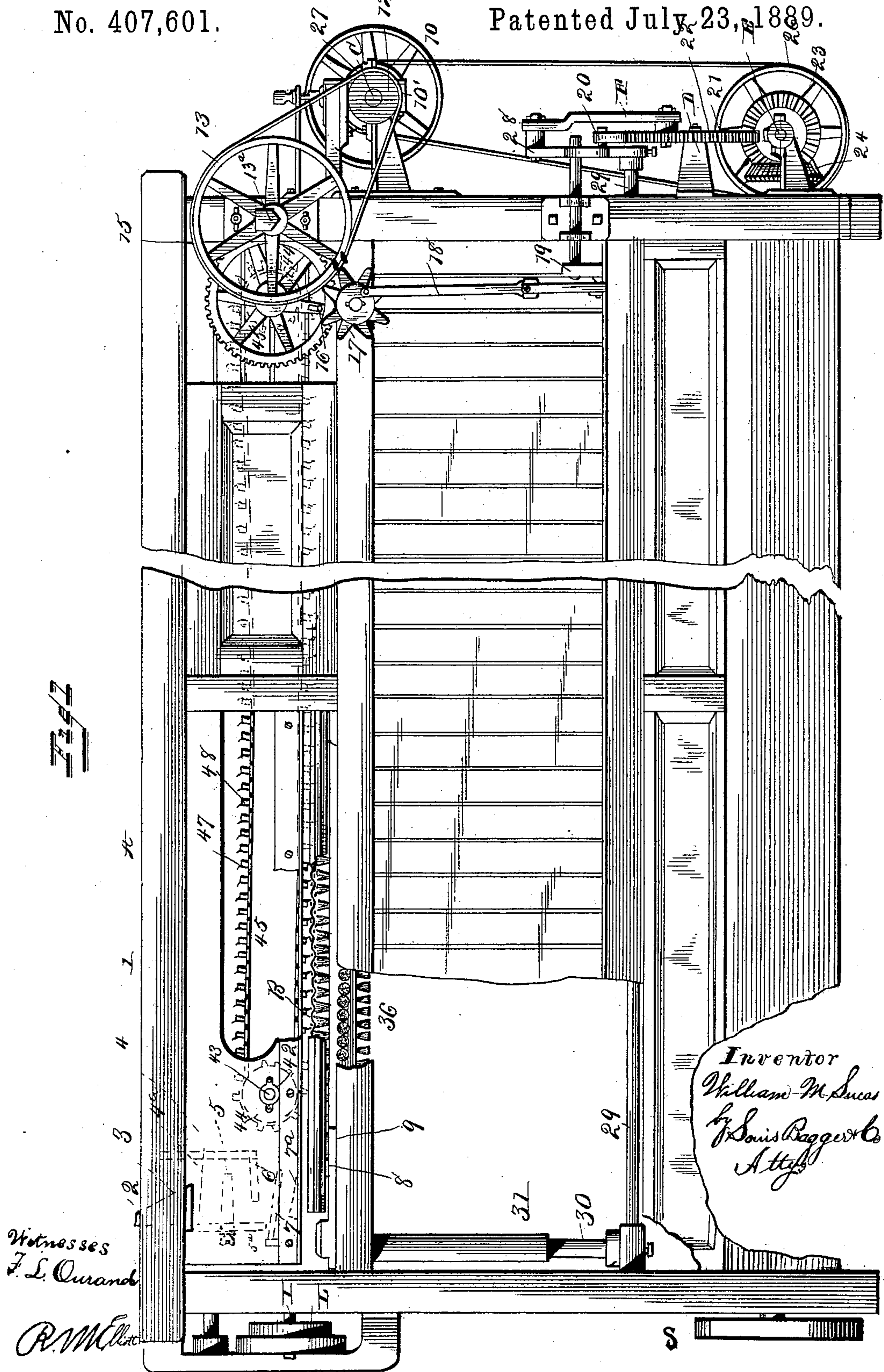


4 Sheets—Sheet 1.

Patented July 23, 1889.

No. 407,601.



(No Model.)

4 Sheets—Sheet 2.

W. M. LUCAS.
FLOUR BOLT.

No. 407,601.

Patented July 23, 1889.

Fig. 2.

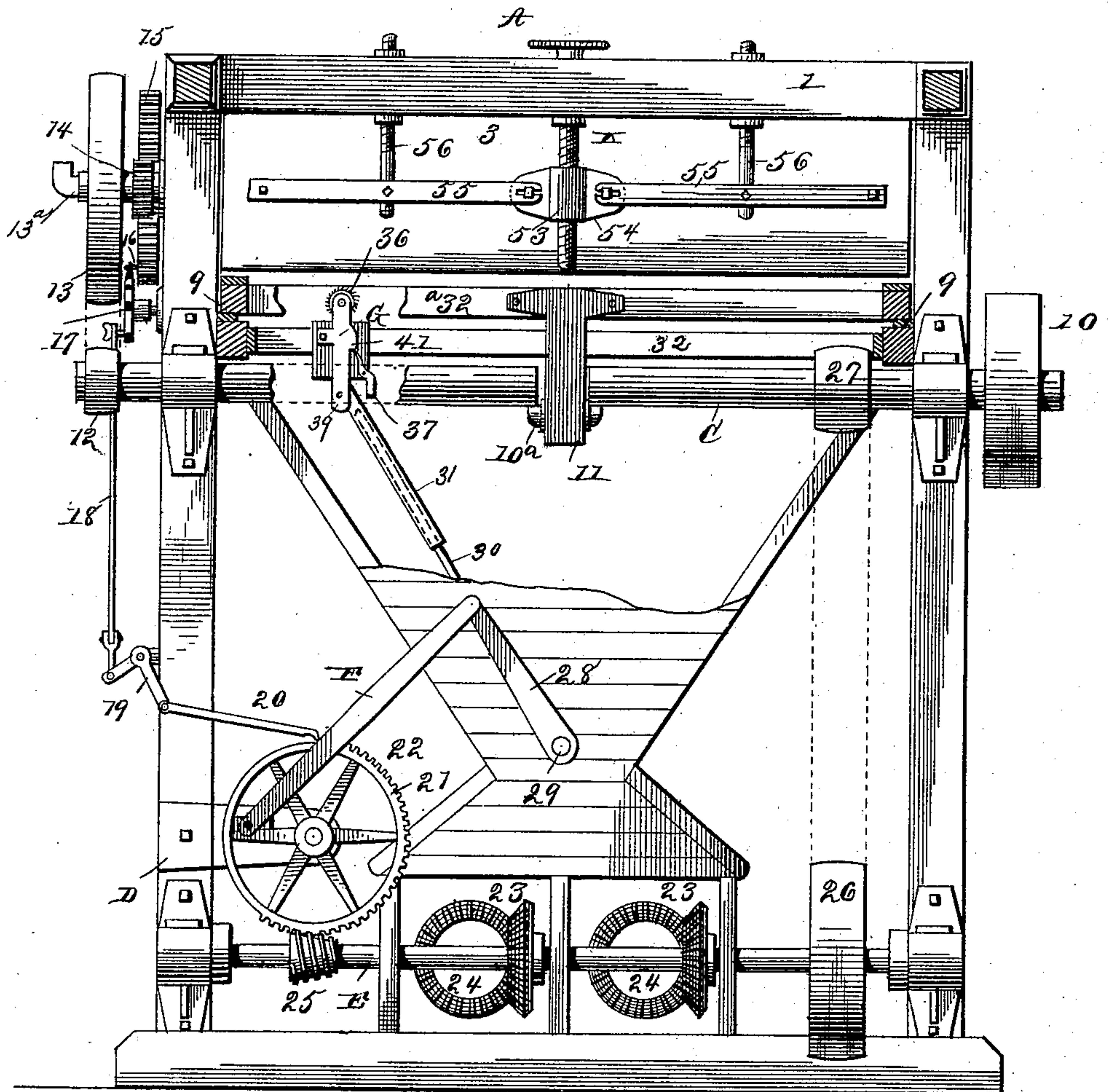
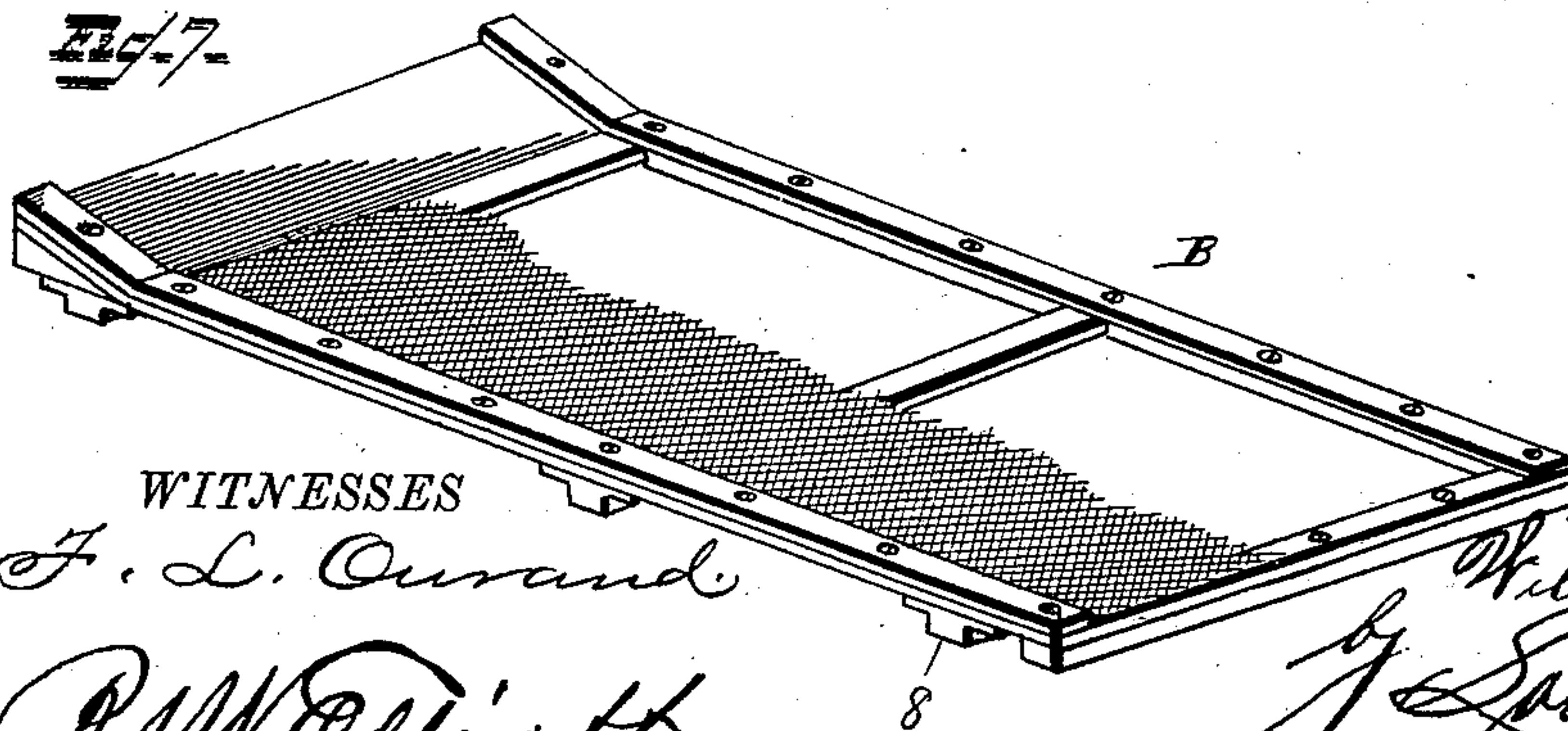


Fig. 7.



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Fig. 3.

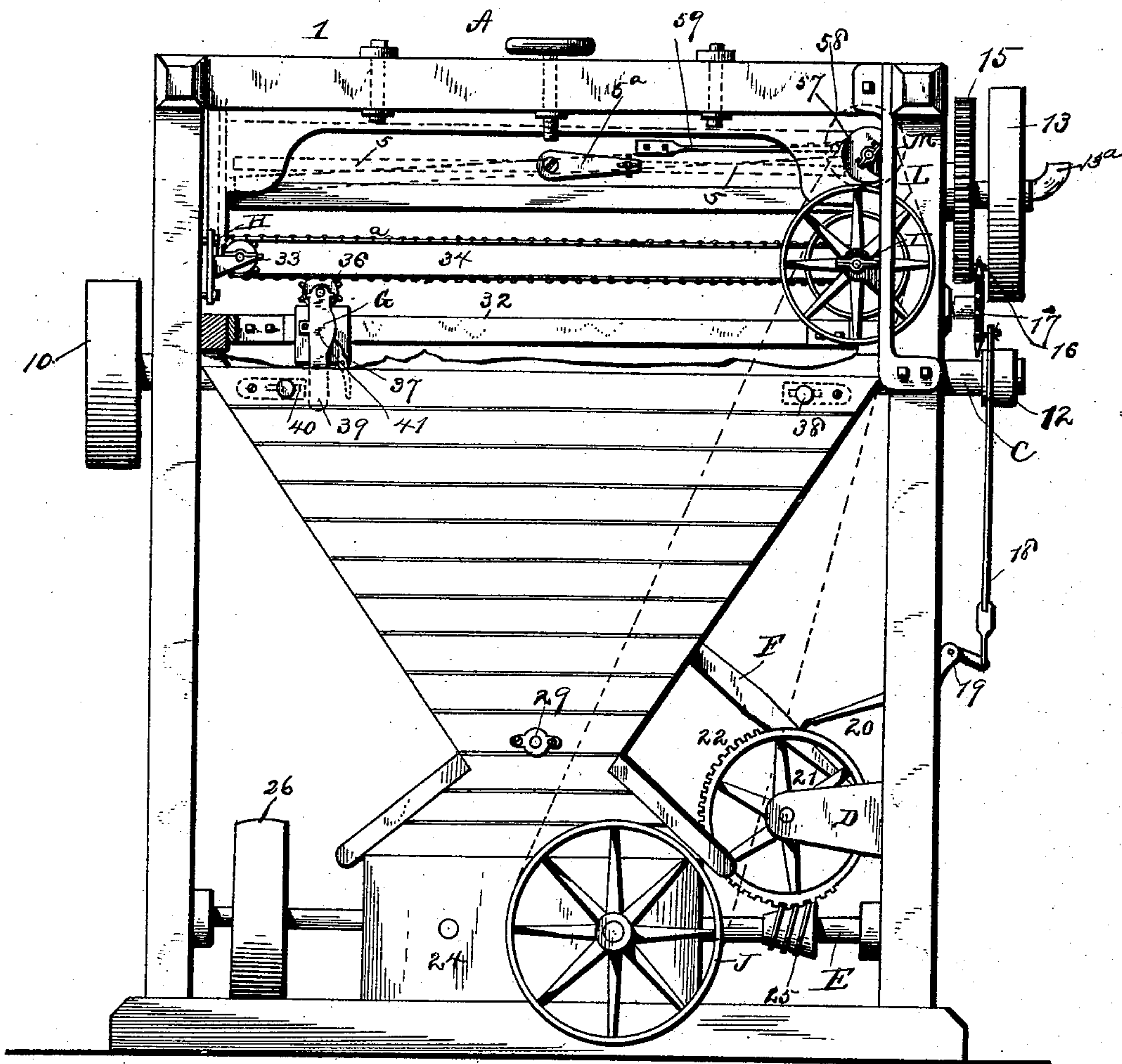
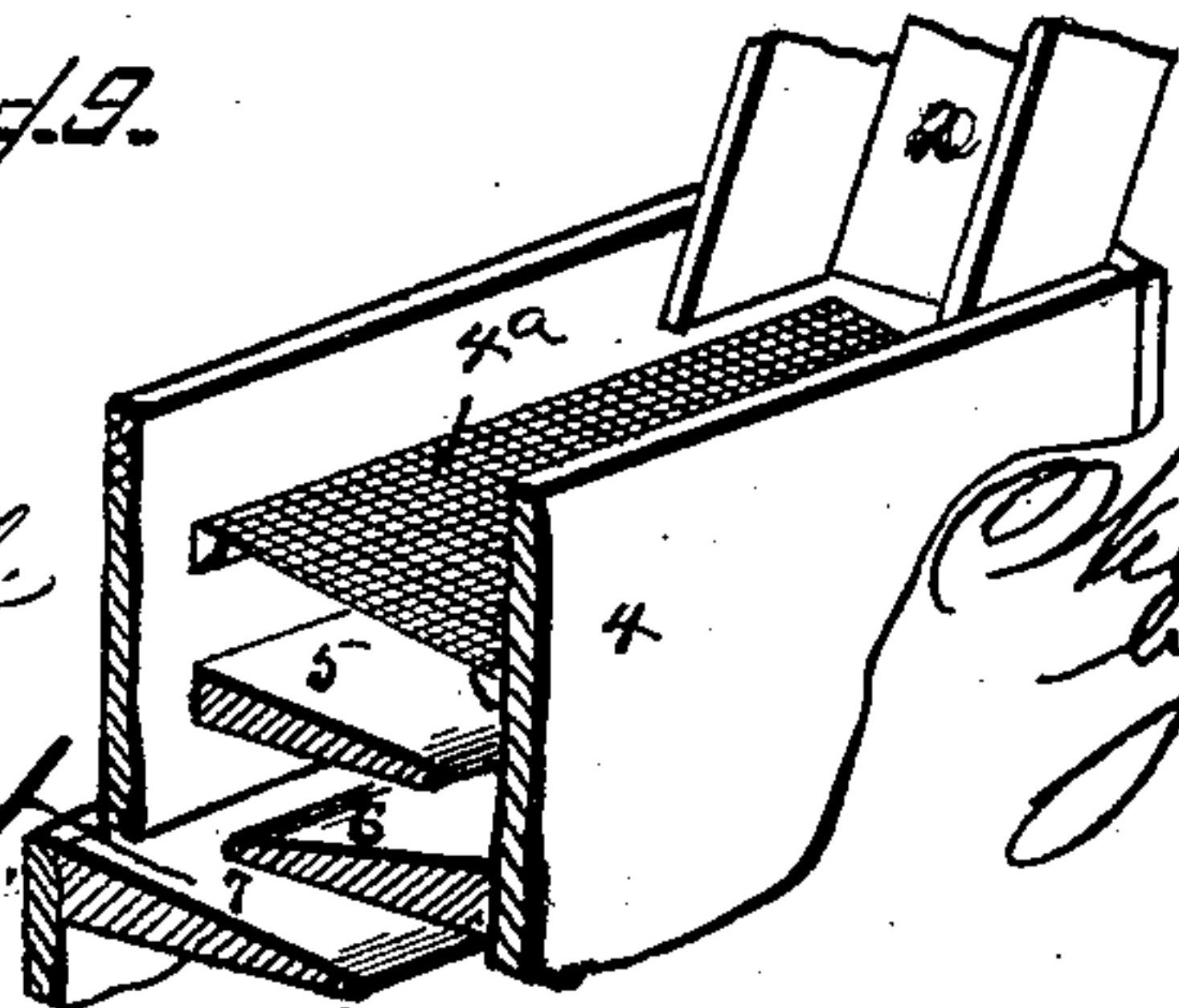


Fig. 9.



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Fig 5.

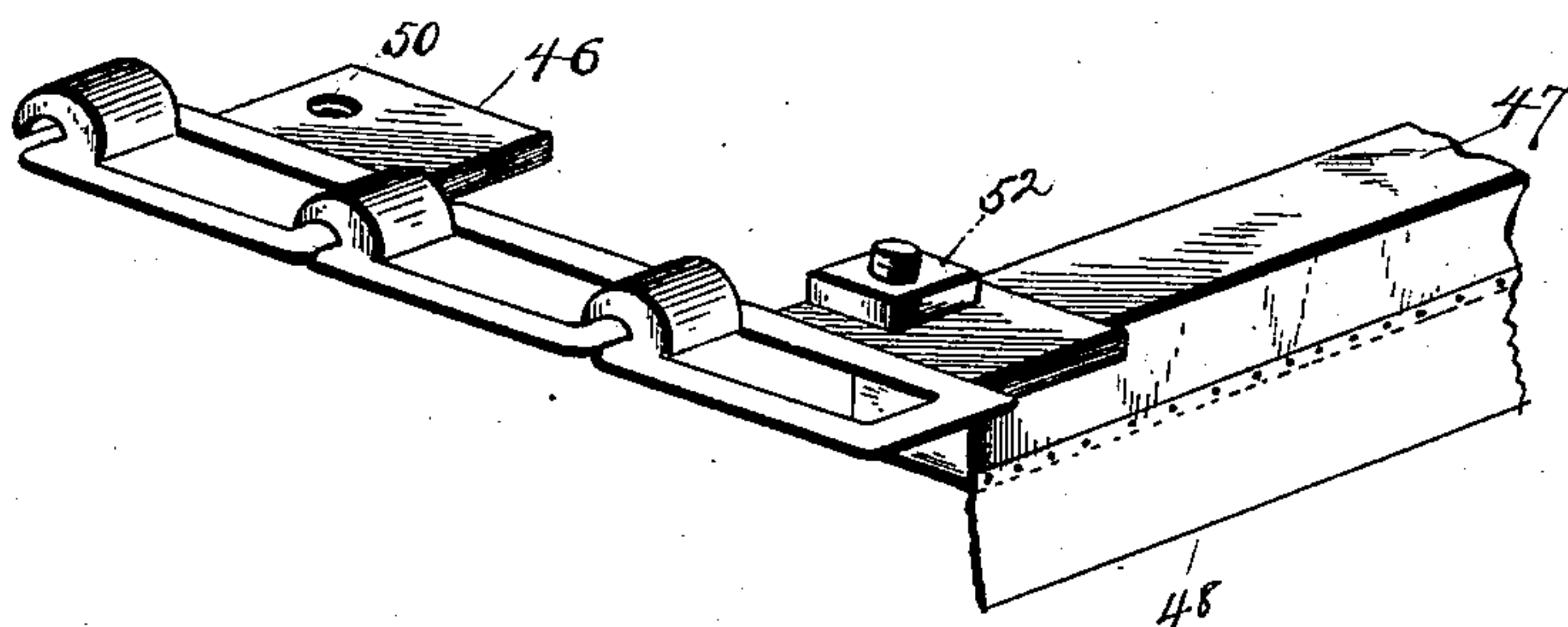


Fig 6.

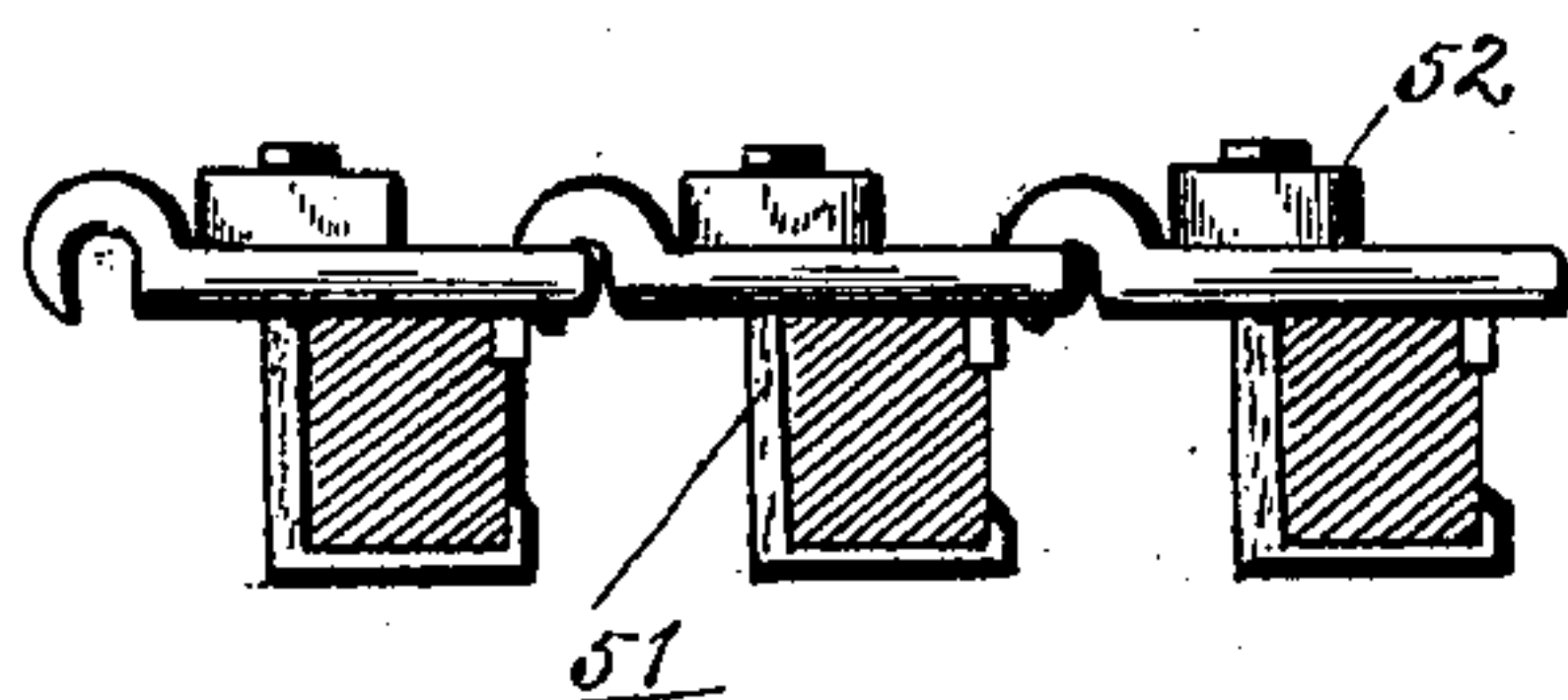


Fig 4.

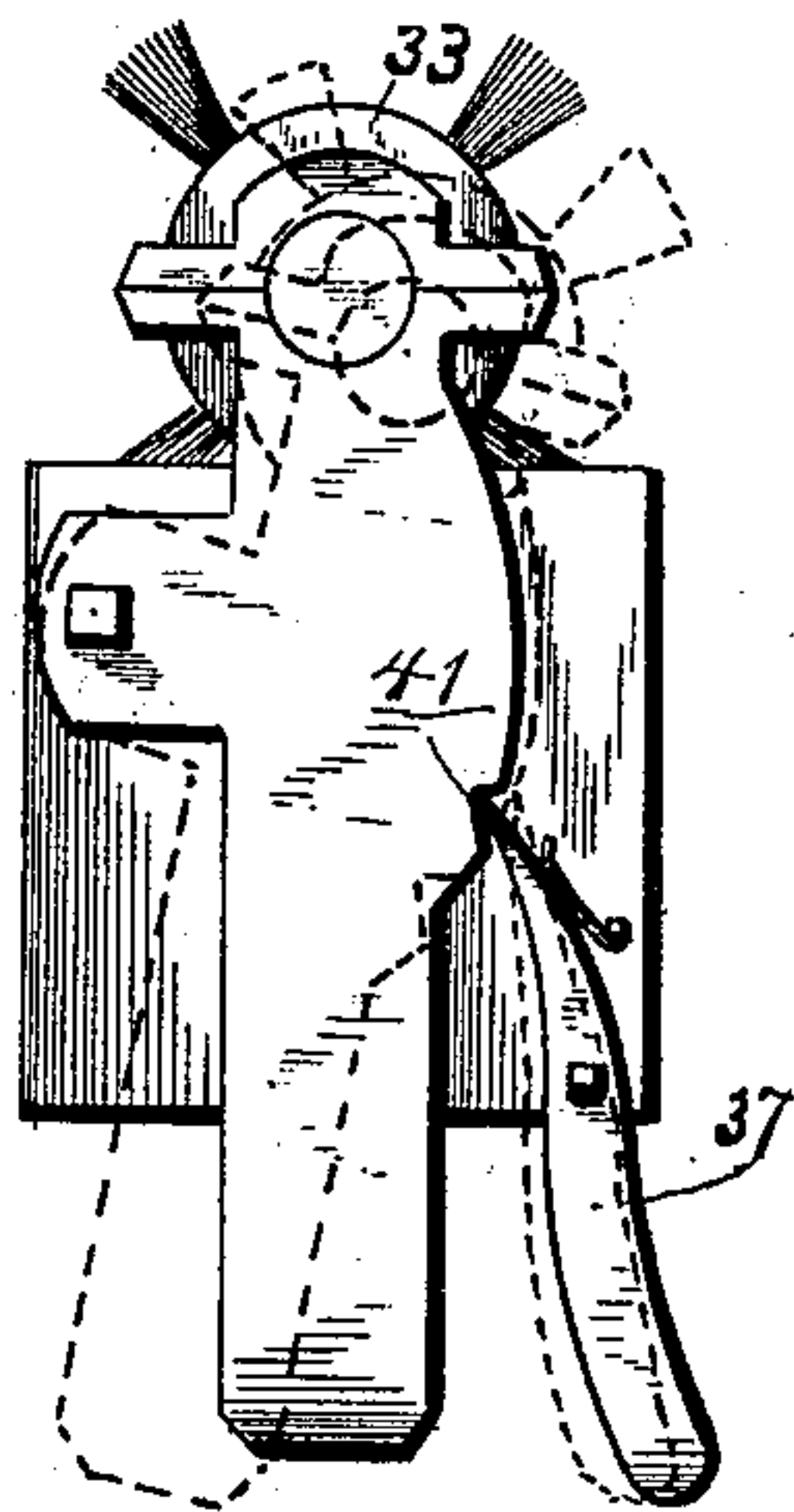
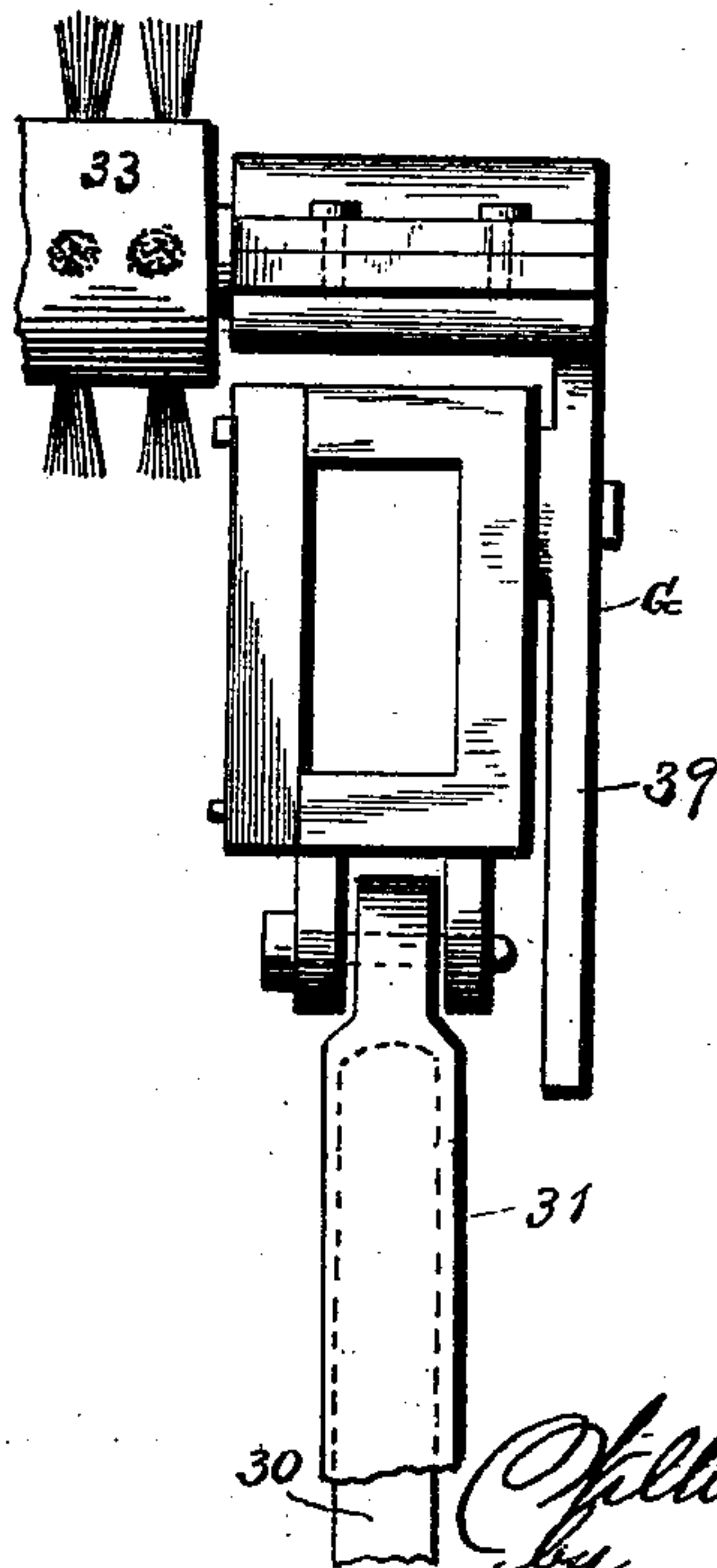


Fig 3.



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UNITED STATES PATENT OFFICE.

WILLIAM M. LUCAS, OF UHRICHSVILLE, OHIO.

FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 407,601, dated July 23, 1889.

Application filed June 23, 1888. Serial No. 277,947. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. LUCAS, a citizen of the United States, and a resident of Uhrichsville, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Flour-Bolts; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in flour-bolts.

The object is to produce a flour-bolt that will readily and efficiently bolt flour through a flat and level sieve and with less power than machines of ordinary construction, and which shall be simple of construction, efficient and durable in use, and comparatively inexpensive of production.

With these objects in view the invention consists in the new and improved construction, arrangement, and combination of parts of a flour-bolt, which will be hereinafter fully described in the specification, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, forming part of this specification, and in which like letters and numerals of reference indicate corresponding parts, Figure 1 is a side elevation, and partly cut away, of the flour-bolting device. Fig. 2 is a view of the tail end, and showing the mechanism for operating the sieve and the cloth-cleaner. Fig. 3 is a view taken from the head end, partly broken away. Fig. 4 is a detail view of the device for throwing the cloth-cleaner into and out of engagement with a sprocket-chain for operating the cloth-cleaner. Fig. 5 is a detail view of an improved sprocket-chain for carrying the brushes for causing the flour to be bolted through the sieve. Fig. 6 is a sectional view of the same, showing another form of device for performing the same function. Fig. 7 is a perspective view of the sieve. Fig. 8 is a detail view of the device for operating the cloth-cleaner; and Fig. 9 is a perspective view of the feed-box, showing its peculiar construction.

Referring to the drawings, A designates the frame of the device, which is of the same construction as is ordinarily employed in flour-

bolts, and in which the feed-box and carriers are secured. Near one end of the top of the frame 1 is the inclined feed-spout 2, through which the material to be bolted passes to the feed-box 3, which is supported in the carrier-frame by spring-hangers 4, by means of which a vibratory motion is imparted to the feed-box, to prevent the material placed therein from clogging. At a point near the top of the said feed-box is secured an inclined wire-cloth 4^a, which is made of the ordinary foraminous material employed for this purpose, through which the material passes and falls upon a dividing-board 5, which is placed in the center of the feed-box, and is secured to the front of the same by any suitable fastening device. This dividing-board is centrally pivoted, so as to admit of its being adjusted to regulate the flow of flour to the sieve, as indicated in dotted lines in Fig. 3, the said adjustment being accomplished by means of an arm 5^a. Below this dividing-board is placed a spreading-board 6, on which the material drops after having left the dividing-board, and from that point drops to a discharge-board 7, which is placed in the bottom of the feed-box. By the time it has reached the discharge-board and passes to the receiving-board 7^a it has been spread out into a thin and even sheet.

B designates the sieve, to the under side of the frame of which is secured a number of steel blocks 8, (see Fig. 7,) which are designed to slide upon strips of hard wood 9, or other suitable material, which are secured to the frame of the device. At the opposite end of the frame to that on which the feed-box is secured is mounted a shaft C, on which is mounted a driving-pulley 10, which imparts motion to the entire device. At a point preferably near the center of this shaft is formed a crank 10^a, on which is secured a connecting-rod 11, which is connected in a suitable manner to the end of the frame of sieve. Thus when the pulley is operated the sieve is caused to reciprocate, the speed of course being regulated by the number of revolutions made by the driving-pulley. As the sieve reciprocates, the flour which is constantly fed upon it has a tendency to clog, thereby preventing the perfect working of the machine. To overcome this obstacle I em-

ploy a device for cleaning the cloth of which the sieve is composed, to be brought in contact with the same at regular intervals, and this device is constructed as follows:

5 On the end of the shaft C and opposite that to which the driving-pulley is secured is mounted a pulley 12, around which passes a belt to another pulley 13, which is mounted above the first-named pulley and is secured
10 in a suitable manner on the frame. On the shaft 13^a of this pulley 13 is mounted a gear-wheel 14, which meshes with a larger gear-wheel 15, one arm of which is provided with a pin 16, which is designed to engage a
15 star-wheel 17, mounted directly below it. On this star-wheel is secured a jointed rod 18, which passes down and connects with a crank 19, secured to one of the uprights forming the frame of the device. On the opposite end
20 of the crank 19, to which the jointed rod is connected, is pivoted a pawl 20.

D designates a standard on which is mounted an intermittent rotary wheel 21, one portion of its periphery being provided with
25 teeth 22, which are engaged by the pawl 20, and the other portion being smooth, as shown in the drawings.

E designates a counter-shaft, which is mounted in suitable hangers on the frame of
30 the device and has secured to it bevel-gears 23, designed to mesh with corresponding gears 24 for operating the worms for conveying the bolted material out of the device, and as this part of the device is the same as in
35 other Letters Patent granted to me, No. 383,062, May 15, 1888, it is not necessary for me to enter into any description of this particular portion of the mechanism. On this shaft E is mounted a cone-shaped worm 25,
40 which is designed to mesh with the intermittent wheel 21 when the device is operated. On the opposite end of this shaft is mounted a pulley 26, which is operated by a belt passing around a pulley 27 on the driv-
45 ing-shaft C.

F designates an arm, which is pivoted at one end to the intermittent wheel 21 and at the opposite end to a crank 28, which is se-
50 cured to a shaft 29, which extends the entire length of the device. On the opposite end of this shaft 29 is secured an arm 30, which is designed to fit within a tube or hollow arm 31, which is connected with the cloth-cleaning device. This hollow arm is secured to the
55 carrier-head G, which slides on a stationary rod 32, rigidly secured to the frame of the device.

H designates a bracket, in which is mounted a sprocket-wheel 33, around which passes a
60 sprocket-chain 34, operated by means of a sprocket-wheel secured to a shaft I, the said shaft being revolved by means of a belt which passes from a pulley J, which is mounted on one of the worm-shafts and is operated by
65 means of the bevel-gears 23 and 24, as before described. Now in order to understand the operation of this portion of the device it will

be necessary to follow each movement, and in order to facilitate a fuller understanding I will now proceed to describe the operation 70 of this portion of the device.

When the gear-wheel 15 is revolved and the pin 16 engages the star-wheel 17 and causes it to revolve, thereby imparting a ver-
75 tical reciprocating motion to the jointed rod 18, which motion operates the crank 19, and with it the pawl 20, the pawl will engage one or more teeth on the intermittent rotary wheel 21 and push it forward until the teeth on the wheel come in contact with the cone-
80 shaped worm 25, when it will then be revolved by the mechanism of the device. As it revolves, the arm F is thrown forward, moves the crank 28 and turns the shaft 29, and with it the rod 30. As the rod 30 moves to
85 one side, the hollow arm will move the carrier head G and cause it to move up a sufficient distance to cause the sprocket-wheel 33^a, mounted on the shaft on which the brushes 36 are secured, to come in contact
90 with the sprocket-chain 34, and thus cause the brushes to revolve and clean the sieve. As the carrier-head moves across the rod 32, and when it reaches the other side, a pawl 37, which is secured to the carrier-head, comes
95 in contact with a pin 38 on the frame and causes the said head to drop out of contact with the sprocket-chain. The carrier-head is carried back by the hollow arm above referred to to the other side, and the arm 39, on which
100 the sprocket-wheel and brushes are mounted, strikes against a corresponding pin 40 on the other side of the device and causes the arm to be raised until the pawl 37 engages a notch 41 on the carrier-head, and thus hold the
105 sprocket-wheel in engagement with the sprocket-chain until it reaches the other side of the device, as before described. By using the hollow arm it will be readily seen that as the carrier-head reaches the center of the
110 frame the hollow portion will slide down over the part 30, and as it passes the center it will be elongated, so as to keep the sprocket-wheel always in constant contact with the sprocket-chain, until it reaches the pin which
115 releases the pawl and causes the brushes to cease working.

In the sides of the frames in which the feed-box is secured and at each end of the same are secured bearings 42, in which are
120 journaled transverse shafts 43, upon which are rigidly keyed sprocket-wheels 44, and around which pass the sprocket-chain 45. Each alternate link of this sprocket-chain is formed with an outward-extending solid plate
125 46, to which are secured wooden cross-strips 47, on the outer edges of which are attached the strips of cloth 48, or other yielding material, which comes in direct contact with the upper surface of the sieve-cloth. As this is
130 one of the important features of my invention, I will more particularly describe the construction of this part of the device. As shown in Fig. 5, one of the links of the

sprocket-chain is provided with a shoulder, in which is formed an opening 50, designed for the reception of an L-shaped bolt 51. Thus, should one of the strips of cloth become worn
 5 out or one of the pieces of wood become broken, it will only be necessary to loosen the nut 52 and remove the piece and replace it with a new one, thereby obviating any delay, while if the ordinary rivet were employed, or
 10 even a screw, it would occasion a great loss of time to repair one of the injured pieces.

In order to regulate the height of the carriers, so as to allow the strips of cloth to be kept at the necessary height, a movable carrier-frame support is used for this purpose,
 15 and is constructed as follows:

K designates a bolt, which extends through the top of the frame of the device, and is provided on its lower end with a nut 53, which is
 20 provided with flanges 54. On each of these flanges is hinged an arm 55, and to each of these arms is attached another bolt 56, which is provided with suitable nuts. Thus the carrier-frame may be elevated or depressed,
 25 as desired, so as to produce the best result.

L designates a pulley, which is mounted on the shaft I, around which passes a belt to a smaller pulley M, which is mounted in suitable bearings secured to the frame. On the
 30 shaft 57 of the pulley M is mounted an eccentric 58, to which is secured a spring 59, which is secured to the side of the feed-box. Thus the feed-box is caused to vibrate while the mechanism is operated, and causes the substance contained therein to be constantly vibrated to prevent any clogging of the same.

In operation the flour, which is fed into the machine through the feed-spout 2, passes through the wire-cloth and falls upon the dividing-board, and as the feed-box is being continually reciprocated the material is caused to pass over the dividing-board and drops on the spreading-board and from that point to the discharge-board and over the same
 45 in a thin and even sheet to the receiving-board. The traveling carrier-strips having been raised or lowered to the desired point, as before described, here come in contact with the material. The constantly-moving carriers
 50 thus catch the flour as it is fed upon the forward end of the sieve-cloth, and the fine flour will thus be separated from the coarse, while the latter will pass off, in the usual manner, over the rear end of the sieve-frame and fall
 55 into a compartment constructed for that purpose, while the fine flour, under the action of the carriers, passes through the cloth of the sieve.

Having thus fully described my invention, what I claim as new, and desire secure by Letters Patent, is—

1. In a flour-bolt, the combination of the feed-box, the inclined wire-cloth therein, the centrally-pivoted adjustable dividing-board, and the inclined spreading-boards, substantially as described. 65

2. The combination of the carrier-belt, links having a shoulder extending parallel thereto, a cross-strip beneath the shoulder, and an L-shaped bolt extending through the
 70 shoulder and cross-strip to clamp the same in place, substantially as described.

3. The combination of the counter-shaft, the cone-shaped worm thereon, an intermittent gear meshing with the worm, a brush-carrier head operated by the intermittent gear, a sieve in contact with the brush-carrier head, a pawl, and mechanism connecting with the
 75 pawl to operate the intermittent gear, substantially as and for the purpose specified. 80

4. The combination of the supporting-frame, a star-wheel journaled thereon, a jointed rod pivoted to the star-wheel, a crank connecting with the rod, a pawl on the crank, an intermittent gear-wheel operated by the pawl, a
 85 brush-carrier head operated by the intermittent gear, and a gear-wheel carrying a pin to operate the star-wheel, substantially as described.

5. The combination of the intermittent
 90 wheel, an arm pivoted thereto, a shaft carrying at one end a crank connecting with the arm and at its other end a rod, a hollow arm fitting on the rod, and a brush-carrier head connecting with the hollow arm, substantially
 95 as described.

6. The combination, with the frame of the device, of the carrier-head moving thereon, an arm on the carrier-head, a brush-shaft mounted in the arm, the sieve above the brush-
 100 shaft, a pawl on the arm, pins on the frame for engaging the pawl, and mechanism, substantially as described, for operating the carrier-head to throw it into and out of engagement with the sieve, substantially as de-
 105 scribed.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM M. LUCAS.

Witnesses:

JOHN BUDD,
 JOHN MILONE.