

No. 614,285.

Patented Nov. 15, 1898.

A. & L. BORLINGHAUS.
MACHINE FOR FILLING BOXES.

(Application filed Dec. 20, 1897.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

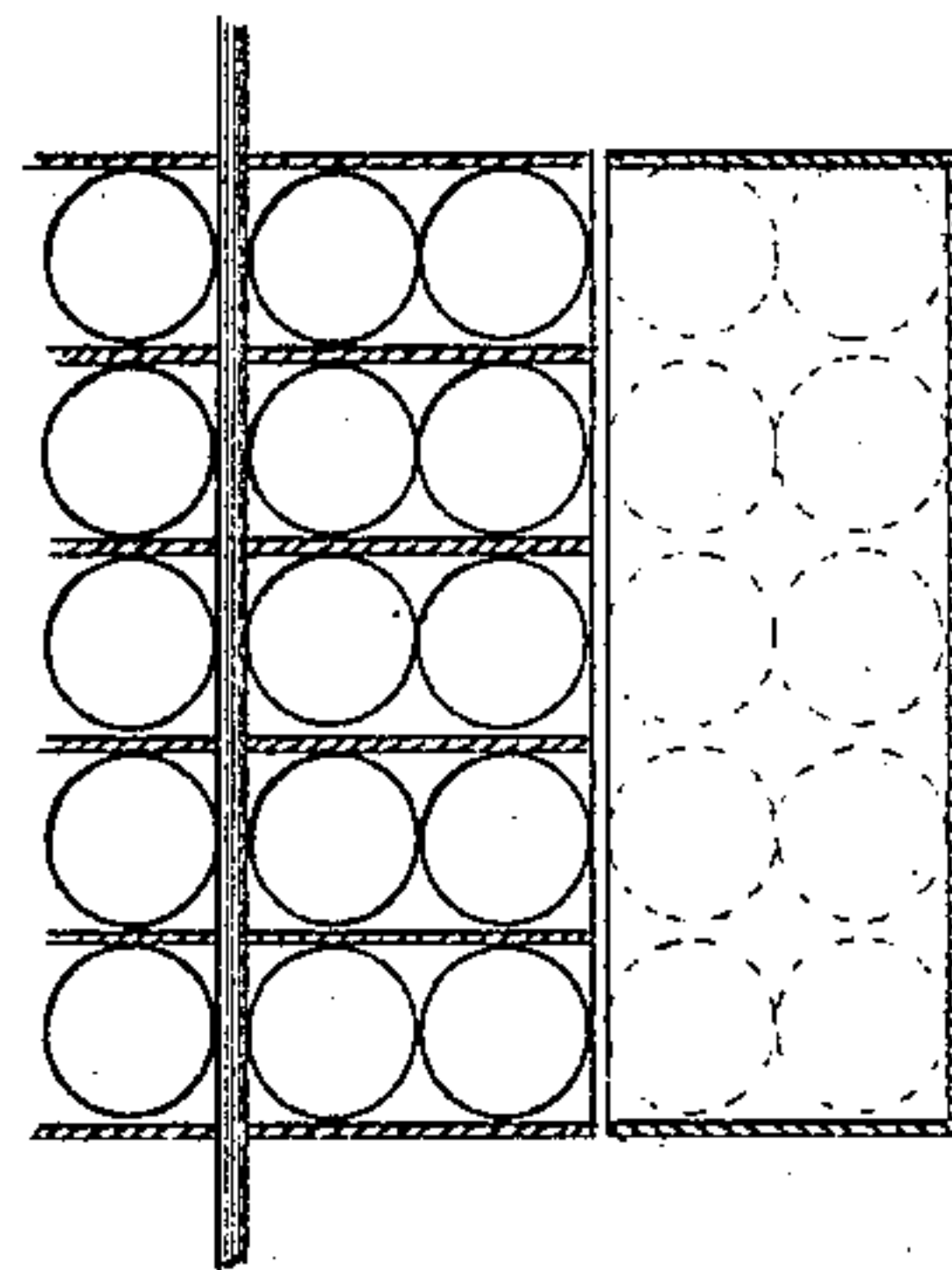
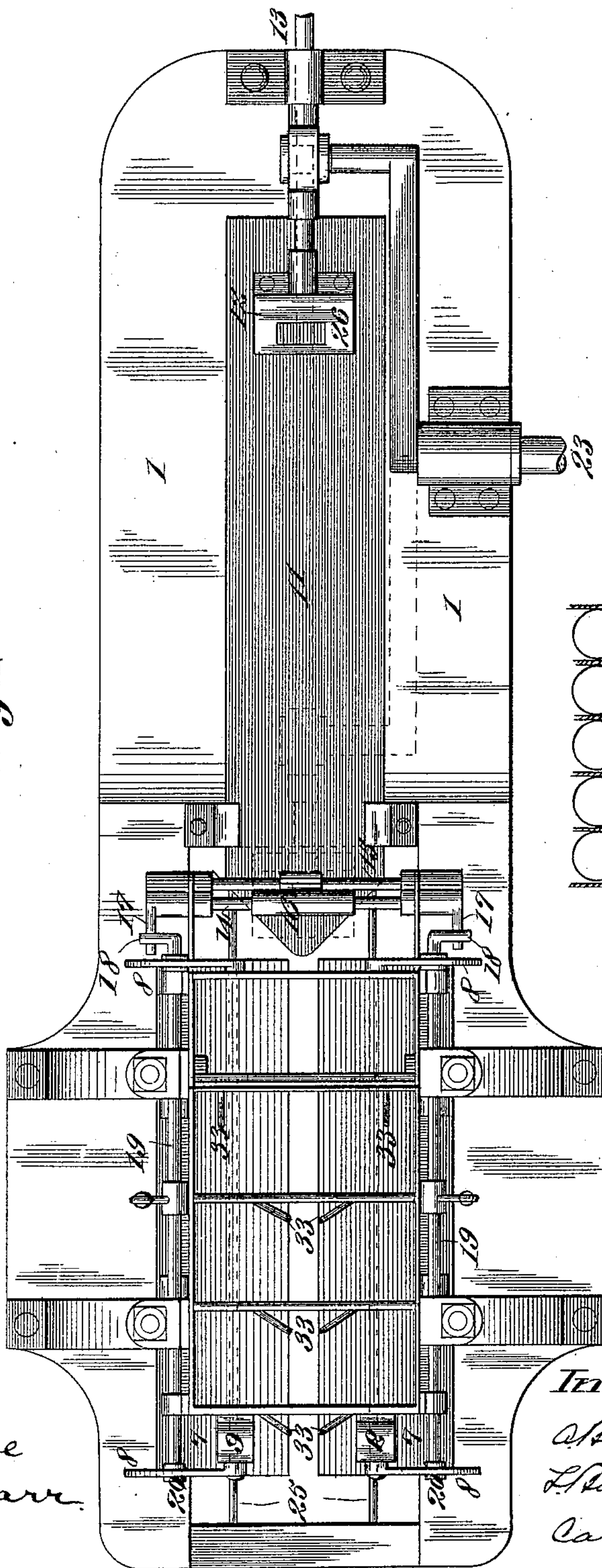


Fig. 10

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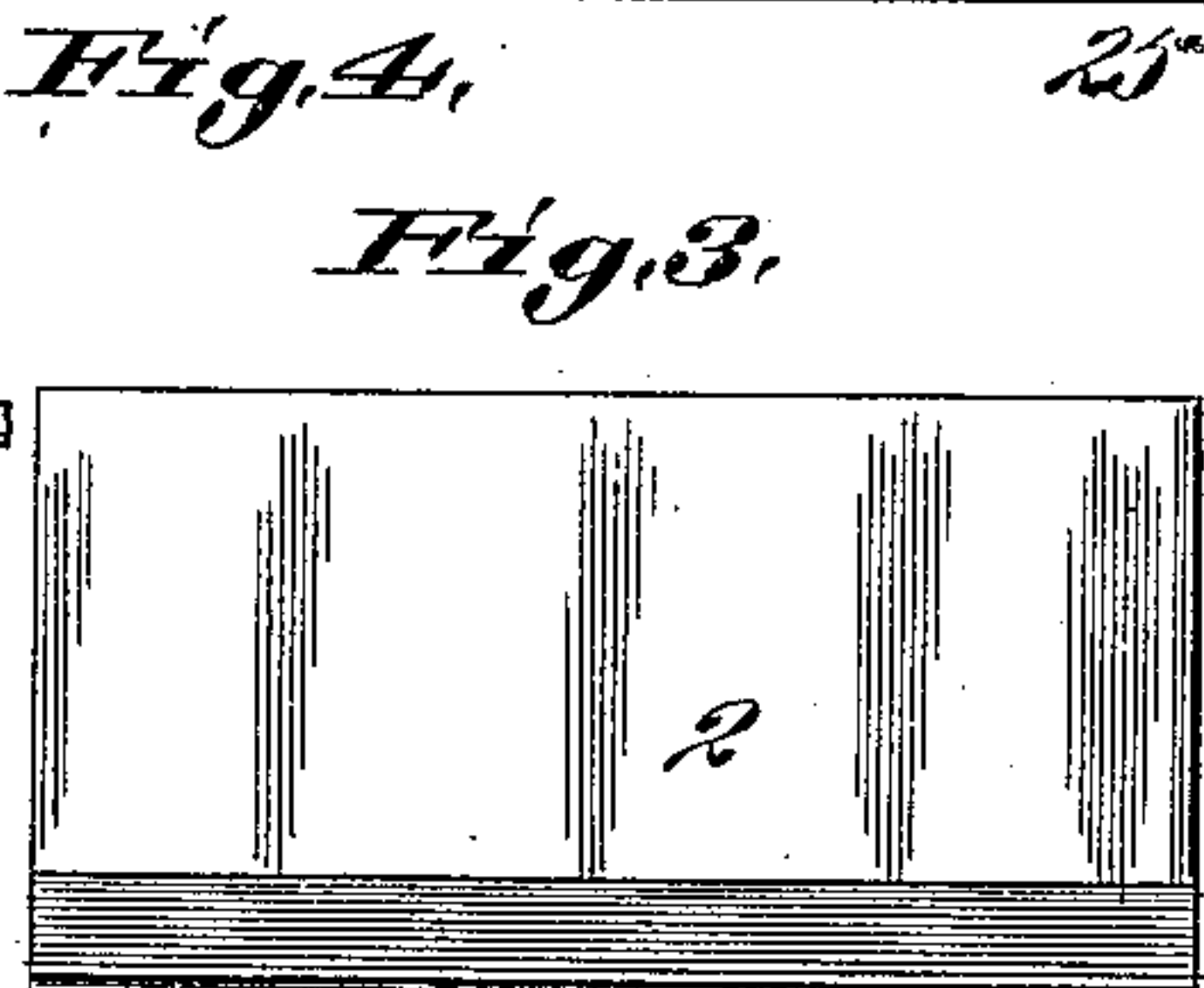
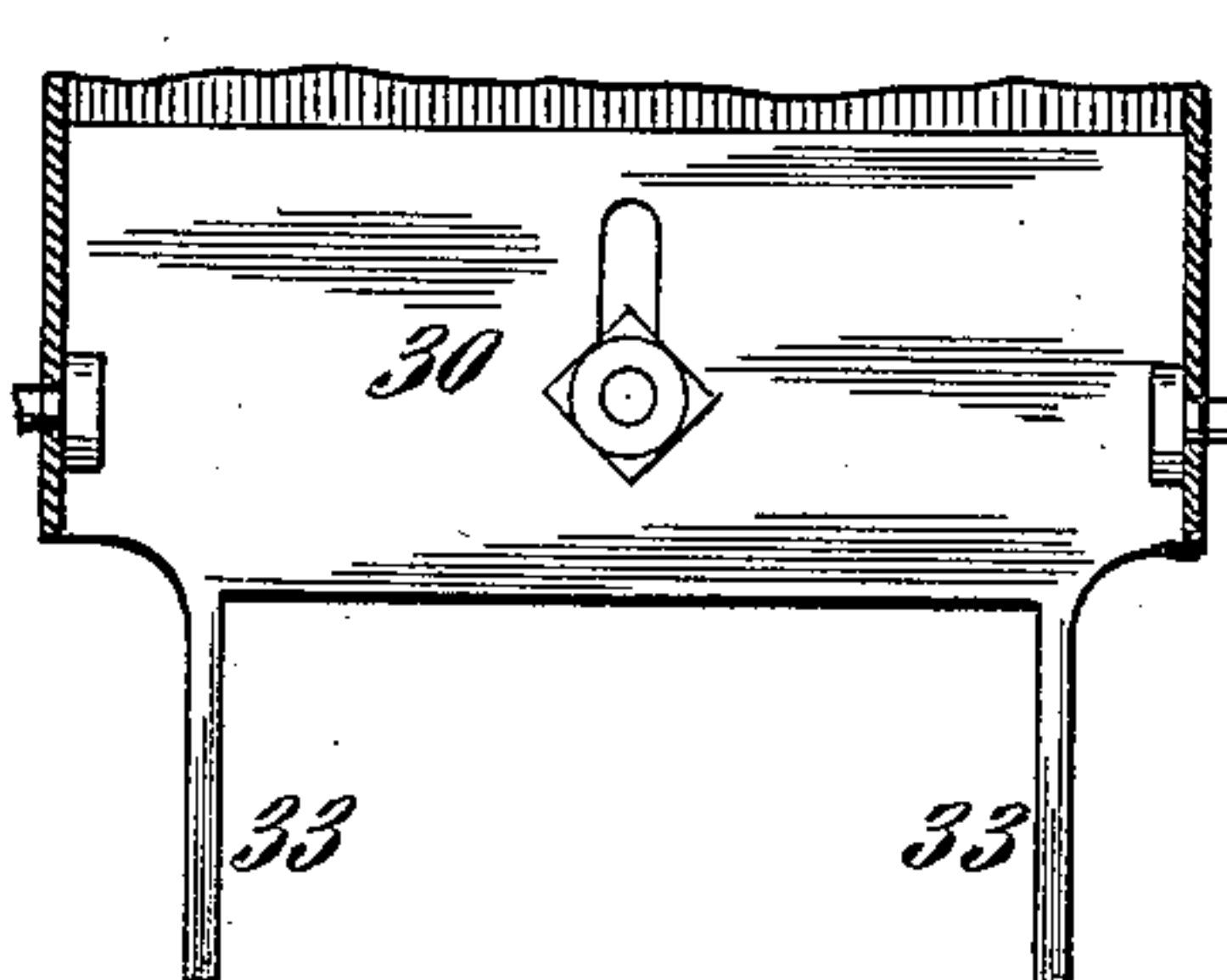
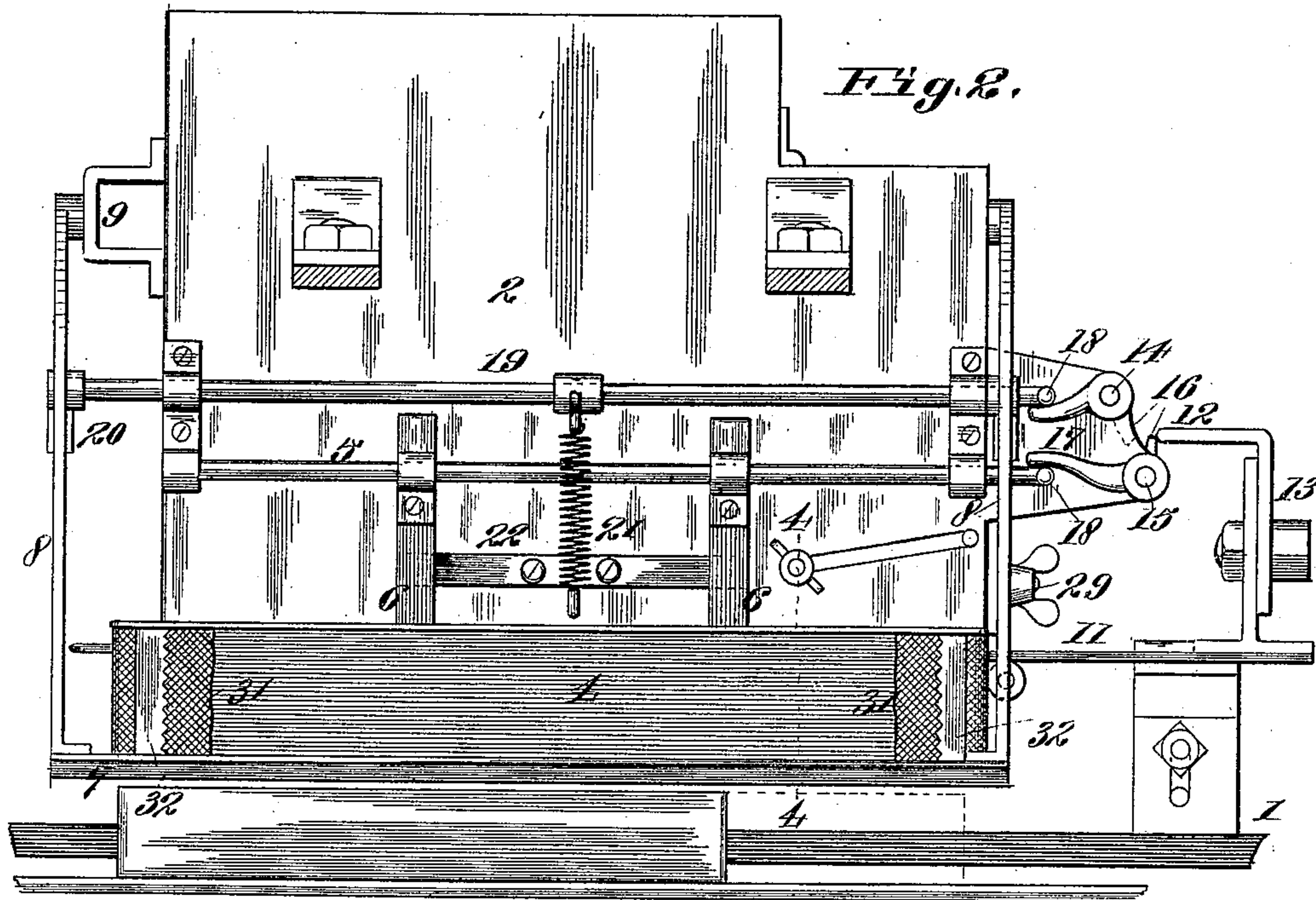
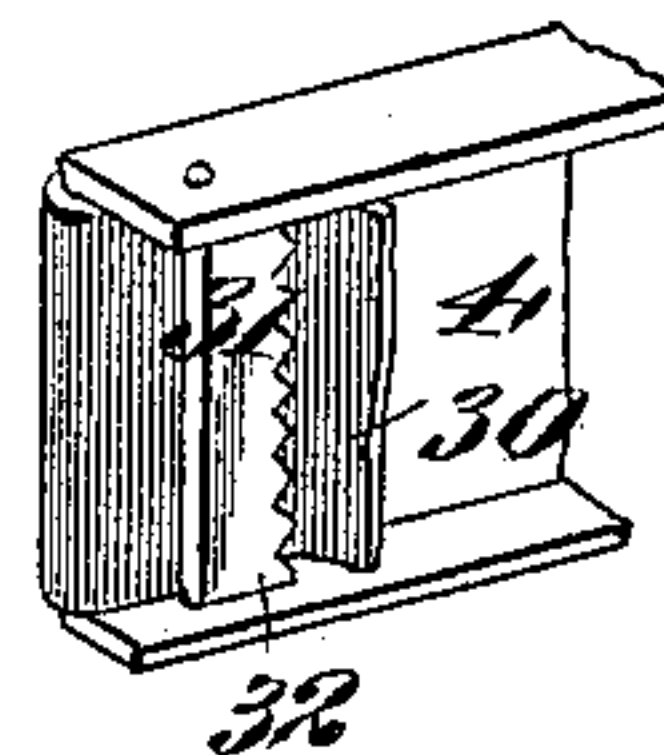


Fig. 5.



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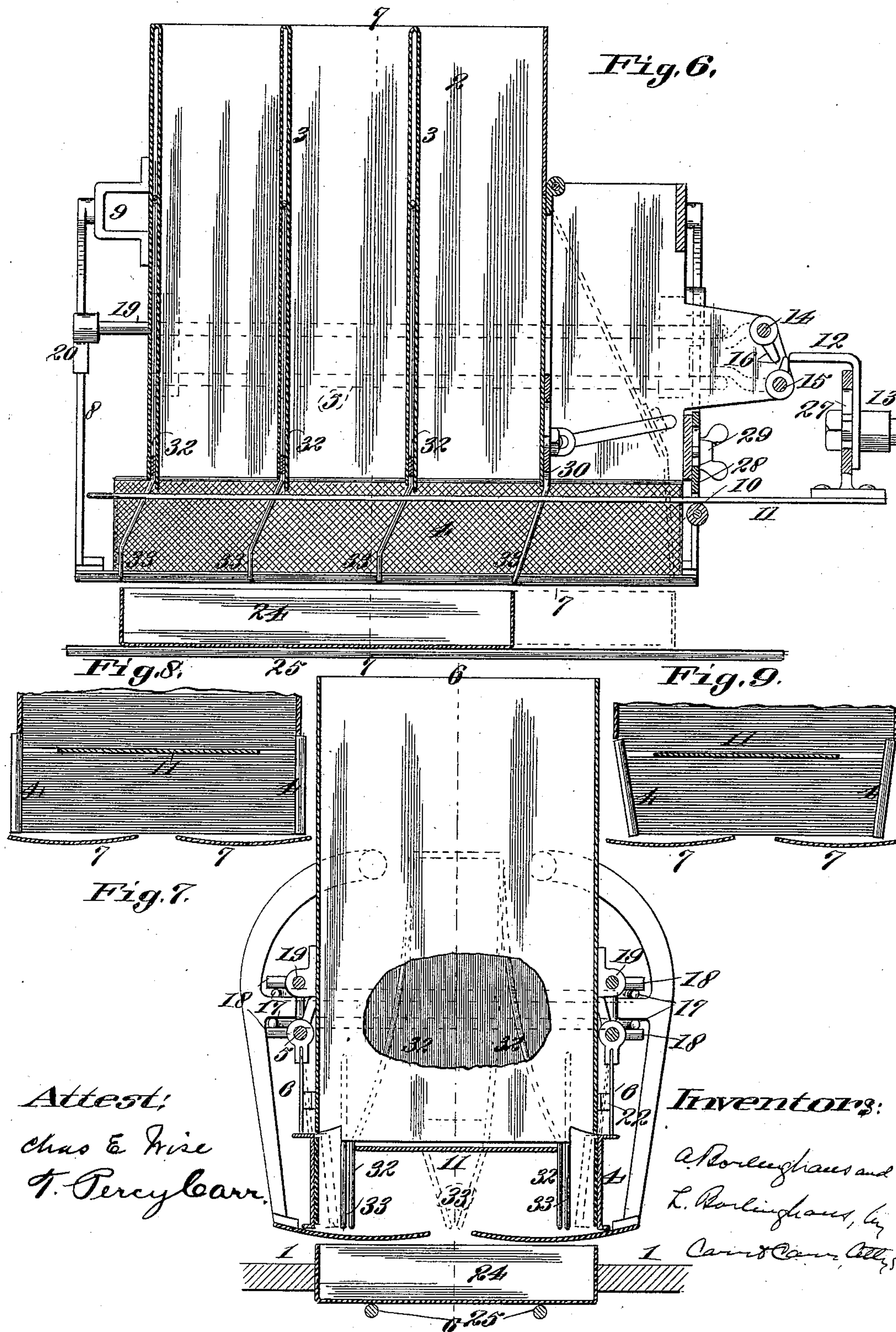
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

AUGUST BORLINGHAUS AND LOUIS BORLINGHAUS, OF ST. LOUIS,
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MACHINE FOR FILLING BOXES.

SPECIFICATION forming part of Letters Patent No. 614,285, dated November 15, 1898.

Application filed December 20, 1897. Serial No. 662,585. (No model.)

To all whom it may concern:

Be it known that we, AUGUST BORLINGHAUS and LOUIS BORLINGHAUS, citizens of the United States, residing in the city of St. Louis, in the State of Missouri, have invented a new and useful Machine for Filling Boxes, of which the following is a specification.

Our invention relates to machines for packing matches, cigarettes, coffee, and other articles in boxes; and it consists in the construction and arrangement hereinafter described and claimed.

In the accompanying drawings, which form part of this specification, Figure 1 is a plan view of a machine embodying our invention. Fig. 2 is a side view of the main portion thereof. Fig. 3 is an end view of the main portion thereof. Fig. 4 is a detail view showing the adjustable end plate of the hopper. Fig. 5 is a detail showing the manner of fastening the rubber pad of the evener. Fig. 6 is a longitudinal section of the main portion on the line 6 6 of Fig. 7. Fig. 7 is a transverse section on the line 7 7 of Fig. 6. Figs. 8 and 9 are fragmental transverse vertical sections through the hopper, and Fig. 10 is a view of a modified form.

Like symbols refer to like parts wherever they occur.

Upon the framework 1 of our machine is supported a hopper 2, which is generally divided by transverse partitions 3 into several compartments, as shown in the drawings, which show the machine specially arranged for packing matches and like articles. In this construction the lower portion of the sides of the hopper consist of the plates 4, suspended from longitudinal shafts 5 (preferably by means of springs 6) or otherwise arranged to swing transversely. The bottom plates 7 of the hopper are fastened to arms 8, pivotally suspended from bearings 9, fixed on the ends of the hopper, whereby said bottom plates may be swung out beyond the sides of the hopper.

In the end of the hopper, at a predetermined distance above the bottom plates, is a slot or opening 10 in alinement with a reciprocating

horizontal plate 11, which constitutes a divider for measuring off and separating a definite quantity of the contents of the hopper. A tappet 12 is arranged on the rear portion of the divider-plate or other part moving therein in position to actuate intermediate mechanism and through it the side and bottom plates of the hopper. As shown in the drawings, the tappet consists of a piece fixed on the rod 13 and projecting forwardly at a suitable distance above the divider-plate. On a suitable framework are two transverse horizontal shafts 14 15, each carrying a tappet 16 16, arranged to rest normally in the path of the reciprocating tappet 12. Each of said transverse shafts likewise has two outturned arms 17 arranged near the opposite sides of the hopper, and each of said arms 17 on the transverse shafts bears, respectively, against like arms 18 on four shafts 19, arranged longitudinally outside of the hopper, whereby the partial turning of the transverse shafts effects a partial turning of the four longitudinal shafts. As above stated, the side plates 4 of the hopper are secured to the shafts 5, respectively. The other longitudinal shafts 19 have cams or wipers 20 fixed thereon and arranged to bear against the pivotal arms 8, which carry the bottom plates. The parts are returned to their normal positions by suitable springs. As shown, a coiled spring 21 is used to return the shaft which operates the bottom plate, and a flat spring 22 on the side of the hopper returns the side plate and its operating-shaft.

The operation of the mechanism thus far described is as follows: The divider-plate is reciprocated by any suitable mechanism, such as a crank-shaft 23, whose crank-pin turns in a slotted yoke fixed to the reciprocating rod. In the normal position the contents of the hopper rest on the bottom plates and the movable side plates are flush with the fixed portion. The box 24 to be filled rests on a support 25 below said hopper. As the divider-plate moves forwardly it cuts off a certain quantity of the contents of the hopper from the mass above and becomes a tempo-

rary support for the main mass when the bottom plates are swung aside. Shortly before the limit of its movement the tappet moving with the divider-plate strikes against the tappet 16, mounted on the side-plate-operating shaft 15, whereby the two side plates are pressed toward each other for the purpose of evening the ends of the articles and confining them within limits slightly narrower than the width of the box. Immediately after this movement the divider-tappet strikes the tappet 16 on the shaft of the bottom-plate mechanism and its motion is transmitted by the intermediate connections, so as to swing said bottom plates apart from beneath the hopper. Simultaneously with the latter portion of this movement the side plates swing apart, whereupon the contents of the hopper below the divider-plate, being left without support, drop into the box, while the divider-plate sustains the mass above it. For the purpose of effecting the springing apart of the side plates at the proper time the divider-tappet has a hole 26 through it in line with the tappet 16 of the side-plate-operating mechanism, whereby the pressure on the side plate is released during the forward movement of the divider as soon as the tappet is free to enter said hole.

Obviously the mechanism described is capable of various modifications and the drawings illustrate divers developments of the same. For the purpose of adapting the device to boxes of different depths the divider-plate is made vertically adjustable, by means, for instance, of an adjustable bolt-and-slot fastening 27, to the reciprocating rod. As this change involves a change of the location of the opening in the end plate, such end plate 28 is made vertically adjustable—as, for instance, by elongated slots and clamps 29. Similarly also a false end plate 30 may be hinged so as to swing longitudinally, and thus vary the length of the hopper as desired.

The machine illustrated in the drawings is specially designed for packing matches. In order to prevent ignition, the movable side plates are covered with a pad or band of soft rubber 31. The detail view in Fig. 5 illustrates a convenient means of fastening such band, consisting of a pivotal serrated plate 32, arranged to bind the band like an ordinary buckle.

In order to straighten any matches which may have fallen crosswise of the others, spring-wires 33 are disposed vertically in pairs with a space between the two springs of a pair wider than the end of the divider-plate, said plate being tapered more or less for the purpose. These springs may be conveniently located inside of the hollow partitions of the hopper, as shown. Their operation is to be spread by the divider-plate and to turn any matches which may lie crosswise in their course.

What we claim is—

1. A box-filling machine comprising a hopper the lower portion of whose side is transversely movable, a movable bottom, and a movable divider-plate arranged at a suitable distance above said bottom, and adjunctive devices whereby said side portion is first moved inwardly and then said side portion is moved outwardly and said bottom is withdrawn, substantially as and for the purpose set forth.

2. A box-filling machine comprising a hopper the lower portion of whose side is transversely movable, a movable bottom, and a movable divider-plate vertically adjustable above said bottom, and adjunctive devices whereby said side portion is first moved inwardly and then said side portion is moved outwardly and said bottom is withdrawn, substantially as and for the purpose set forth.

3. A box-filling machine comprising a hopper, having a movable bottom, and a movable side plate, and a divider-plate arranged at a suitable distance above said bottom, and means whereby the motion of the divider-plate is caused to press said side plate inwardly and then release the same and swing out the bottom, substantially as and for the purpose set forth.

4. A box-filling machine comprising a hopper having a bottom suspended on pivoted arms, a laterally-movable side plate near the bottom, a movable divider-plate at a suitable distance above the bottom, and means for pressing said side plates inwardly and then outwardly and for swinging out the bottom, said divider-plate having a tappet moving therewith arranged to actuate the side-plate-operating means and then to release the same and actuate the bottom-operating means, substantially as and for the purpose set forth.

5. A box-filling machine comprising a hopper having a bottom suspended on pivotal arms, a laterally-movable side plate near the bottom suspended on a longitudinal shaft, two transverse shafts operatively connected respectively to said longitudinal shaft and to another shaft arranged to operate the bottom-suspension arms, and a movable divider arranged at a suitable distance above the bottom and having a tappet moving therewith, said transverse shafts each having a tappet in the path of the divider-tappet and arranged so that the divider-tappet first strikes the tappet of the side-plate-operating mechanism and then releases the same and operates the tappet of the bottom-operating mechanism, substantially as and for the purpose set forth.

6. In a box-filling machine, an evening device comprising a hopper having the lower portion of its side suspended on springs, substantially as and for the purpose set forth.

7. A box-filling machine comprising a hopper, a movable bottom, and a movable divider-plate, and thin transversely-movable spring-pieces depending in the path of the di-

vider-plate and arranged to be actuated thereby, substantially as and for the purpose set forth.

5 8. A box-filling machine comprising a hopper divided transversely into compartments, and having a movable bottom, a movable divider-plate above said bottom, an evening device at the side of said hopper and a straightening device inside thereof and extending

below said divider-plate, substantially as and for the purpose set forth.

Signed December 18, 1897.

A. BORLINGHAUS.
LOUIS BORLINGHAUS.

Witnesses:

JAMES A. CARR,
CHAS. E. WISE.