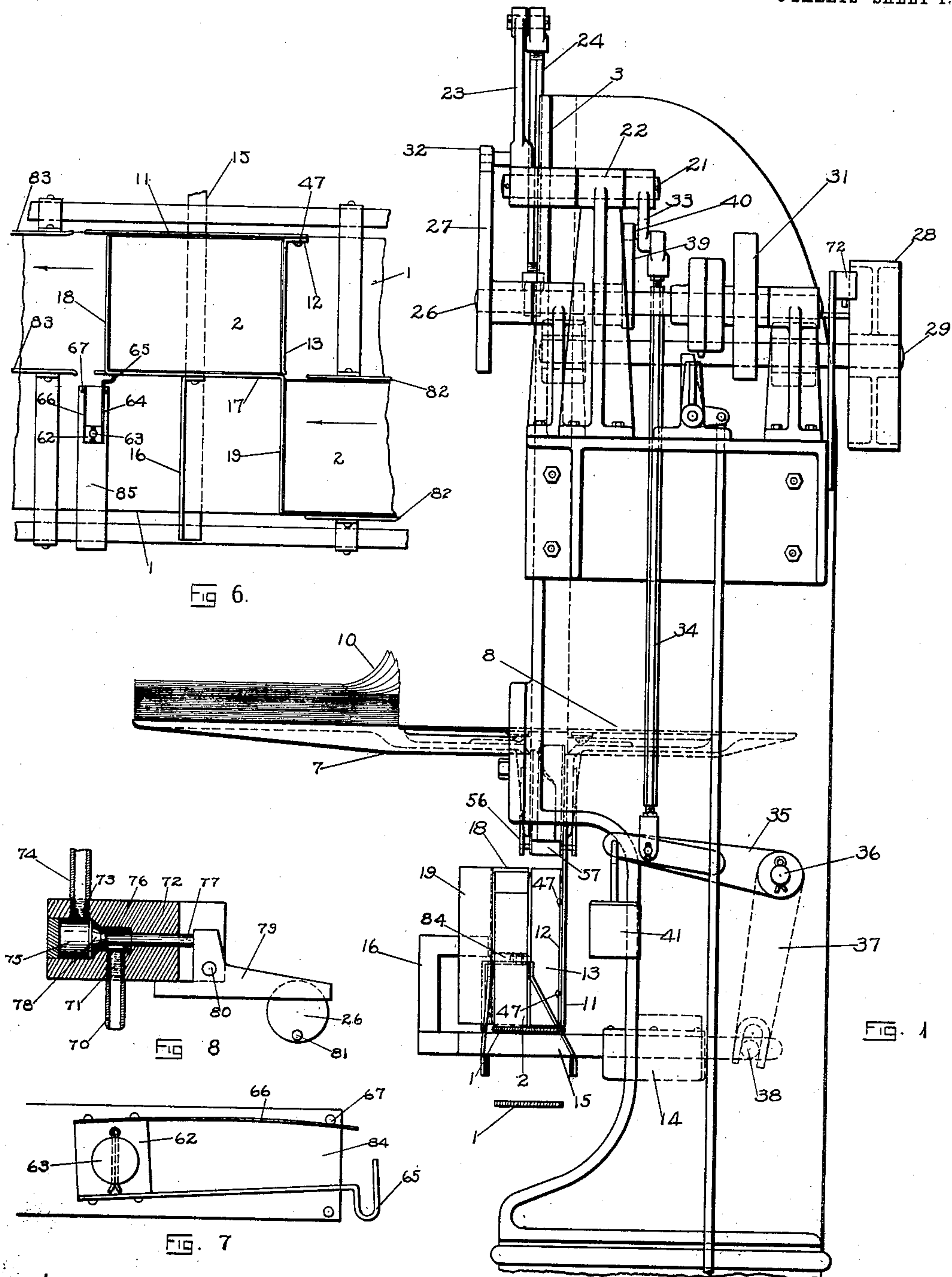


W. A. JOPLIN.
MACHINE FOR LINING BOXES.
APPLICATION FILED MAY 10, 1909.

954,739.

Patented Apr. 12, 1910.

3 SHEETS—SHEET 1.



WITNESSES
Alvin Farr
John H. Parker

INVENTOR
William A. Joplin
by Macdonald, Balver, Copeland & Dike
Attorneys

954,739.

3 SHEETS—SHEET 2.

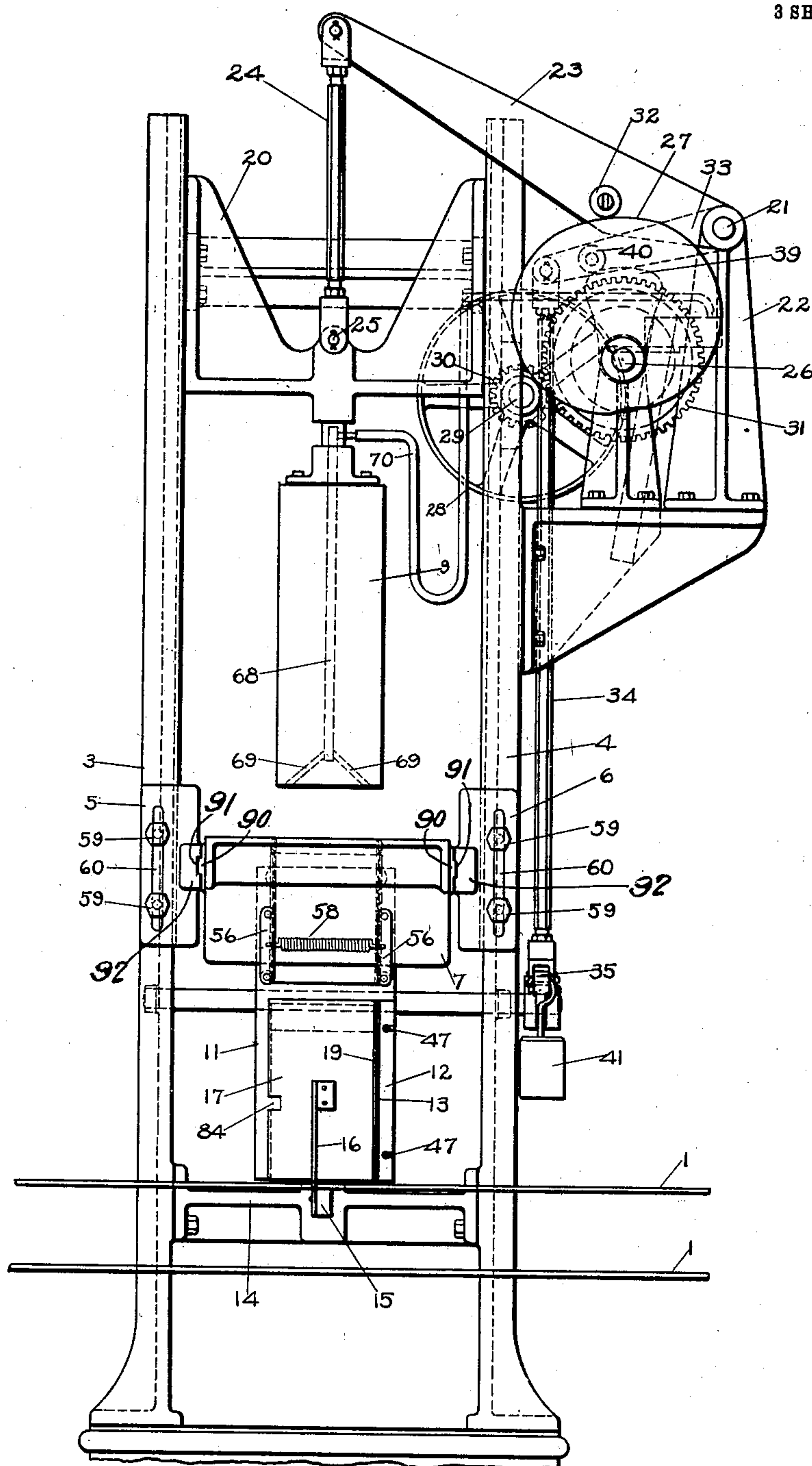


Fig. 2

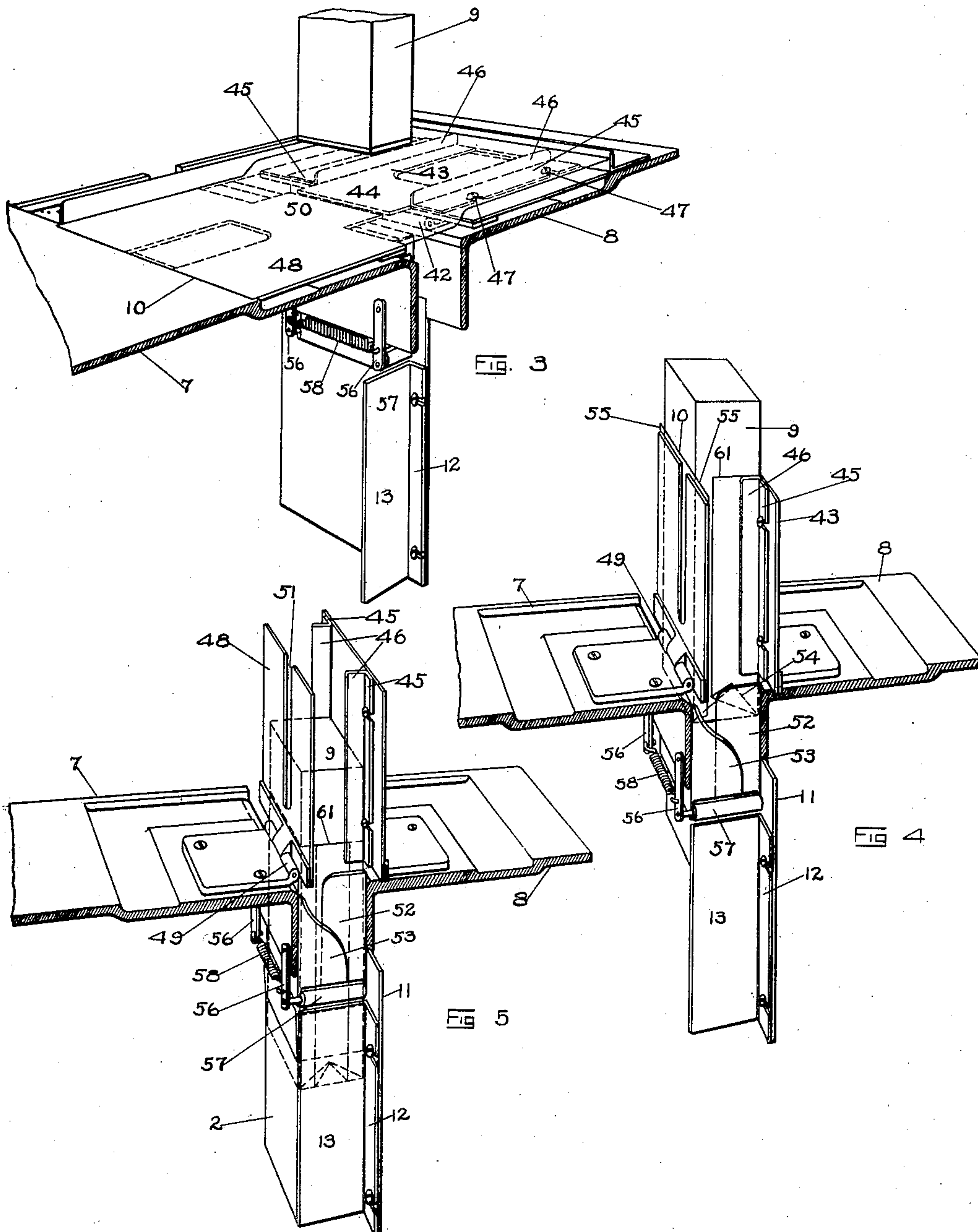
INVENTOR
William A. Joplin
by Macleod, Calver, Capeland & Sike
attorneys

W. A. JOPLIN.
MACHINE FOR LINING BOXES.
APPLICATION FILED MAY 10, 1909.

954,739.

Patented Apr. 12, 1910.

3 SHEETS—SHEET 3.



WITNESSES
Aline Tarr
John H. Parker

INVENTOR
William A. Joplin
by Macleod, Lealver, Caspeland & Sike
attorneys

UNITED STATES PATENT OFFICE.

WILLIAM A. JOPLIN, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR TO PNEUMATIC SCALE CORPORATION LIMITED, OF QUINCY, MASSACHUSETTS, A CORPORATION OF MAINE.

MACHINE FOR LINING BOXES.

954,739.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed May 10, 1909. Serial No. 494,949.

To all whom it may concern:

Be it known that I, WILLIAM A. JOPLIN, citizen of the United States, residing at Lawrence, county of Essex, and State of Massachusetts, have invented a certain new and useful Improvement in Machines for Lining Boxes, of which the following is a specification, reference being had therein to the accompanying drawings.

In putting up package goods in boxes, either when the goods are packaged in advance, or when they are put up by the salesman by order at the counter, as for instance, cereals, candy, sugar or the like, it is very generally the custom to insert a paper lining into the box before the goods are introduced into the box. Heretofore so far as I am aware, linings have always been inserted by hand.

The object of my invention is to produce mechanism whereby the boxes may be lined more rapidly than can be done by hand.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features are pointed out and clearly defined in the claims at the close of the specification.

In the drawings,—Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a front elevation. Figs. 3, 4 and 5 are detail perspective views, partly in section, showing successive stages of the folding mechanism in the operation of folding and inserting the lining into the box. Fig. 6 is a top plan view of a portion of the belt and of the reciprocable slide rod and angle plates which form the pocket for the carton during the lining operation and showing the latch for holding the carton when the plunger is withdrawn. Fig. 7 is a detail view of the latch turned one side to allow the transverse movement of a carton across the belt into position under the plunger. Fig. 8 is a sectional detail showing the valve and its operating mechanism for introduction of compressed air through the plunger block to prevent the lining from sticking to the plunger block when it is withdrawn from the carton after the lining has been inserted.

Referring to the drawings,—in the illustration of the invention shown the boxes are represented by what are termed cartons and are represented as being brought adjacent to the proper place for receiving the lining by

means of a wide traveling belt and are moved by other mechanism successively one at a time in a transverse direction to another position on the belt to receive the lining.

1 represents the traveling belt and 2 the cartons. The width of the belt is about twice the thickness of the cartons for the reason that will be hereinafter explained.

Adjustably secured to the two standards 3, 4, respectively, are the brackets 5, 6, to which are secured the two tables or shelves 7, 8, which are spaced apart a sufficient distance to allow for the passage of the plunger block 9 which carries the lining sheet down into the carton, the lining sheet 10 being placed upon the two tables 7, 8, so as to bridge the space between them to be engaged by the plunger in its descent.

Fixedly, but adjustably, secured to a depending arm 11 of the table 8 is an angle plate having two arms 12, 13, at right angles to each other, the arm 13 extending crosswise of the upper run of the belt 1, just above it and extending crosswise for about half of the width of the belt.

Mounted in the guide support 14 is a horizontally reciprocable slide rod 15 which extends forward beneath the upper run of the belt and to some distance in front of the same, having at its forward end an upturned angle arm 16 to which is secured an L shaped angle plate having an intermediate portion 17 which lies in a vertical plane parallel with the belt and at one end a bent arm 18 which extends transversely of the belt, about half way across the belt on the opposite edge from the arm 13 and parallel with it, and at the other end an arm 19 which extends also at right angles with the body portion 17 of the angle plate parallel with the arm 18, but in the opposite direction. The boxes are placed on that side of the upper face of the belt which in the travel of the belt will bring the box up against the arm 18 when the plunger 15 is in its most retracted position.

The slide or plunger rod 15 is connected with suitable mechanism whereby the said rod, at proper times, may be made to reciprocate transversely with relation to the belt. The box on the belt is brought up against the arm 18, and alongside of the upright intermediate portion of the angle plate 17. When the plunger rod is moved to the right as shown in Fig. 1, the plate 17

will be moved part way across the belt far enough to bring the end of the arm 18 nearly or quite to the starting plate 11. This will carry the box up against the arm 11, the end of the arm 18 coming up to the arm 11 so that the arms 17, 18, 11 and 13 will form a rectangular pocket for the box during the process of inserting the lining. The arm 19 will extend transversely of that portion of the belt on which the cartons or boxes are carried so as to stop the advance of any on-coming boxes until the movable angle plate 17 is retracted by the plunger rod 15.

Slidable in ways in the standards 3, 4, is a cross-head 20 from which is suspended rigidly a block 9 of the right size and shape to loosely fit inside of the box which is to be lined. This block is hung so as to be centered over the open space between the tables 7 and 8 through which the block is to pass in its descent and also directly over the carton or box when it is positioned as previously described to receive the lining. The cross-head 20 is connected with suitable mechanism for causing it to be raised and lowered at the proper time. The means shown in the drawings for operating the cross-head are as follows: Fulcrumed at one end on the stud 21 having bearings in a bracket 22 is a rocking lever 23, the forward end of the said rocking lever 23 being connected by a connecting rod 24 to the cross-head 20 at 25.

Mounted on a rotary shaft 26 is a cam 27, the shaft 26 being driven in any suitable way. The means shown consist of a driving wheel 28 on shaft 29 carrying pinion 30 which engages with gear wheel 31 on the shaft 26. Any suitable driving mechanism, however, may be employed. Carried on the rocking lever 23 is a roll 32 which engages with the cam 27, whereby the rocking lever is given the proper movement to raise and lower the cross-head 20 and thereby the block 21.

The mechanism shown for actuating the plunger rod 15 previously described is as follows: Fulcrumed on the stud 21 is a rocking lever 33 to the forward end of which is connected the connecting rod 34, the lower end of which is pivotally connected to a lever 35 which is keyed to or otherwise made fast to the rockshaft 36. Rigidly connected with the rockshaft 36 is also a lever 37 forked at its lower end to engage a stud 38 projecting from the horizontal plunger rod 15. Mounted on shaft 26 is a cam 39 which engages a roll 40 carried on the side of the rocking lever 33 whereby the rocking lever 33 is actuated to raise the connecting rod 34 and thereby, through the arm 35 and shaft 36, to turn the forked lever 37 and move the plunger rod 15 to the left, viewing the machine as in Fig. 1, and thereby move the angle plate 17 away from the carton. In

Fig. 1 the parts are shown in such position. When the high part of the cam 39 passes by the roll 40, the weight 41 hung from the free end of the lever 35 will pull down the connecting rod 34 and thereby, through the connecting mechanism, cause the plunger rod 15 to be moved to the right from the position shown in Fig. 1 viewed from the same side, to move the angle plate 17 in the direction to push the box in front of it up against the arm 11 into position to receive the lining.

Hinged to the upper side of the table 8 at its edge on a hinge 42 is a plate or leaf 43 having a portion 44 which extends part way over the space between the two tables, the said plate normally lying flat upon the upper side of the table.

Adjustably secured to the plate 43 are two angle plates 45 with flanges 46 spaced apart from each other enough to embrace the plunger block 9 when it descends. The plate 45 may be adjustably secured to the plate 43 by clamp-screws 47 passing through slots in the plate 45 into the plate 43. The purpose of making them adjustable is to allow for plunger blocks of different widths.

The tables 7, 8, are supported by the brackets 5, 6, respectively, by means of tongues 90 which project from the sides of the tables and engage in grooves 91 in the sides of the lugs 92 on the brackets, said tongues being slidable in said grooves for the purpose of adjusting the two tables 7, 8, toward and from each other, thereby enabling the distance between the folding plates 43 and 48 to be varied to accommodate blocks of different thickness.

Hinged to the edge of the table 7 by a hinge 49 is a plate 48 having a projecting portion 50 which extends part way across the space between the tables 7, 8, toward the projecting portion 44 of the plate 43. Preferably this plate 48 is formed with a slot 51 to make the plate as light in weight as possible.

Secured to the depending arms of the table 8 are two guide plates 52, one on each side of the table, extending parallel with each other about two-thirds of the way across the space between the two tables, and spaced apart from each other sufficiently to allow the passage of the block 9 between them.

Secured to the depending portion of the table 7 are two curved guides 53, one on each side of the table, extending part way across the space between the two tables lapping past and outside of the guide plates 52.

When a box to be lined is brought into proper position by the forward movement of the plunger rod 15 inclosed in the rectangular pocket previously described formed by the arms 17, 18, 11, 13, a sheet 10 of the lining paper being placed upon the two

tables 7, 8, bridging the space between them, and lapping over onto the two tables, the machine is operated to cause the block 9 to descend which, in the course of its descent, strikes the upper surface of the spread out sheet 10 of lining paper where it covers the inward projections 44 and 50 of the hinged plates 43, 48, and as it continues its descent, the pressure upon the inwardly extending portions 44 and 50 of the hinged plates 43, 48, turns the portions 44 and 50 down and turns the plates 43, 48, upon their hinges, bringing them up into a vertical position as shown in Fig. 4, thereby folding the lining sheet up over the lower end of the block 9 and turning it up against the front and back sides of the block, and the wings 46 will turn the laterally extending portions 61 of the lining sheet around against the other two sides or edges of the block 9 as shown in Fig. 4. As the block further descends, the plates 52 will engage and fold over the lower front corners and crease the bottom seam of the paper as shown in dotted lines 54 in Fig. 4. The further descent of the block brings the laterally extending portions 55 of the lining which was turned up by the plate 48 into engagement with the curved guides 53, thereby folding the extended portions 55 of the lining up against the outer side of the guide plates 52 so that the portions 55 will lie flat between the guides 52 and 53, but the continued descent of the block will carry it below the guides 52 so that then the wings 55 will lie against the wings 61 of the lining.

Pivoted to the depending arms of the tables 7, 8, are two pairs of levers 56 in each pair of which is journaled a presser roller 57 which is held by springs 58 with yielding pressure against the folded lining of the block as the block descends in order to smooth the lining upon the block before the block enters the box 2. The block 9 should be enough smaller than the box so that the block with the lining folded thereon will easily enter the box. The downward movement of the block 9 is so adjusted that the block will descend just far enough to carry the lining to the bottom of the box.

The cam 27 lifts the rocking lever 23, and thereby the block 9, at the proper period in its rotation, and when the high point of the cam has passed off the roller, the mere weight of the block 9 is sufficient to cause the descent of the block. Any proper means may be used, however, for elevating and depressing the block at the proper time.

The brackets 5, 6, which support the tables 7, 8, are adjustable vertically by means of the clamp screws 59 which pass through elongated slots 60 in the brackets to provide for difference in the heights of the cartons.

As the belt 1 is constantly traveling in the direction indicated by the arrow in Fig. 6 even during the time that the lining is being

inserted into the carton, it tends to drag the carton, which is being lined, against the arm 18 as shown in Fig. 6, and when the angle plate 17, 18, is moved back after the lining has been inserted, on account of the pressure of the carton against the arm 18, there is a tendency for the carton to be dragged back to some extent and, therefore, to drag it out of the proper alinement with the course which it should take in being carried away by the belt after the arm 18 has entirely withdrawn. For this reason, it is desirable to provide some means for restraining the carton from being dragged back with the angle plate 18. The means which I have provided are as follows: A block 62 is pivoted at 63 to a bracket 85 which is secured to the frame. Said block is so pivoted as to be permitted a rocking movement on a vertical axis. Fast to one side of the block 62 is a plate 64 terminating in a bent latch 65 which extends through a slot 84, shown in dotted lines in Fig. 1, said slot extending laterally through the arm 18 of the angle plate and extending for a short distance into the edge of the plate 17. The latch 65 engages the corner of the carton 2 when in its position under the plunger. When the plate 17 is retracted, the slot in the plates 17, 18, allows the plate to move back without interfering with the latch 65, and the pressure of the latch 65 on the carton will prevent the carton from being dragged back with the angle plate. Secured to the opposite side of the block 62 from the latch plate 64 is a spring 66, the forward portion of which bears against a stud 67. When the angle plate 17 moves forward with a carton to bring it under the plunger, the side of the carton will engage the curved heel of the catch 65 and thus rock the block 62 on its pivot and turn the catch plate 65, as shown in Fig. 7, to allow the carton to ride past it. When the block is thus turned, the spring 66 is flexed, and after the carton has been carried forward its full movement into position under the plunger, the spring 66 will turn the block 62 on its pivot and thereby bring the catch into engagement with a corner of the carton as shown in Fig. 6.

It is found that when the plunger block 9 is raised out of the carton after having inserted the lining, the lining has a tendency to cling to the plunger block and to be partially pulled out or disarranged. Suitable means should be provided to overcome this tendency. The means which I have provided are to inject into the carton down through the plunger block compressed air to resist the tendency of the lining to cling to the plunger block. The mechanism for accomplishing this is as follows: The plunger block 9 is formed with a central bore 68 extending from the top nearly to the

bottom, and when near the bottom, it is preferably branched having a plurality of outlets 69 through the bottom. Leading to the passage 68 through the block is a pipe 70 which may be a flexible hose connected by a suitable nipple with the entrance to the passage 68, the other end of the hose 70 being connected with an outlet port 71 in a valve 72. The valve 72 is formed with an inlet port 73 into which a pipe 74 leads from a suitable compression-pump or other source of supply of compressed air. The valve 72 is formed with a chamber 75 into which the inlet port 73 leads and is formed with a smaller chamber 76 connecting with the chamber 75 and from which the outlet port 71 leads. A valve stem 77 reciprocates through a passage in the valve 72 and is formed with a conical head 78 which, when in its seated position, closes the passage from the inlet port 73 to the outlet port 71 and which in its open position allows free passage from the inlet port 73 to the outlet port 71. The forward end of the valve stem 77 is connected with a bell-crank rocking lever 79 pivoted at 80. Projecting from the shaft 26 is a pin 81 which, at a certain point in the rotation of the shaft 26, engages one arm of the rocking lever 79, turning the rocking lever on its fulcrum, and thereby moving the valve stem 77 in a direction to open the valve and admit the compressed air through the port 71 and tube 70, thence through the plunger block 9. The pin 81 is so placed on the shaft 26 that the opening of the valve will take place when the plunger block is in its lowermost position in the carton, and the dwell of this pin on the arm 79 will continue long enough to keep the valve open until the plunger block has withdrawn from the carton.

In order to guide the carton into proper position upon the belt to be engaged by the reciprocating bar 17, guide rails 82 are provided above the belt, and in order to guide the carton in its passage after the lining has been inserted, another set of guide rails 83 are provided.

While as already stated, in the illustration of the invention shown the boxes are represented by what are termed cartons, the invention is not limited in scope to the use of the machine for filling receptacles or containers of that particular type but in the use of the word box or boxes in the specification and claims it is intended to include any form of receptacle or container with which the machine is adapted to be used.

What I claim is:

1. In a machine for lining boxes, means for supporting the box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves in the same plane with each other hinged intermediate their

ends above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger, said leaves being adapted to support a lining sheet before the sheet is engaged by the plunger, means for moving the plunger downward into engagement with the lining sheet superimposed upon said leaves and down into the box beneath, thereby turning the leaves on their hinges and carrying the lining sheet down into the box and means for withdrawing the plunger from the box.

2. In a machine for lining boxes, means for supporting the box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves in the same plane with each other hinged intermediate their ends above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger, said leaves being adapted to support a lining sheet, means for moving the plunger downward into engagement with the lining sheet superimposed upon said leaves and down into the box beneath, thereby turning the leaves on their hinges and turning the outwardly extending arms of the leaves together with the superimposed portion of the lining sheet up against opposite sides of the plunger, before the plunger enters the box and means for withdrawing the plunger from the box.

3. In a machine for lining boxes, means for supporting the box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves in the same plane with each other hinged intermediate their ends above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger, said leaves being adapted to support a lining sheet, means for moving the plunger downward into engagement with the lining sheet superimposed upon said leaves and down into the box beneath, thereby turning the leaves on their hinges and turning the outwardly extending arms of the leaves with the superimposed portion of the lining sheet up against opposite sides of the plunger before the plunger enters the box, guides which fold the extended side portions of the lining against the remaining two sides of the plunger before it enters the box and means for withdrawing the plunger from the box.

4. In a machine for lining boxes, means

for supporting the box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves in the same plane with each other hinged intermediate their ends above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger, said leaves being adapted to support a lining sheet, means for moving the plunger downward into engagement with the lining sheet superimposed upon said leaves and down into the box beneath, thereby turning the leaves on their hinges and turning the outwardly extending arms of the leaves with the superimposed portion of the lining sheet up against opposite sides of the plunger before the plunger enters the box, guides which fold the extended side portions of the lining against the remaining two sides of the plunger before it enters the box, guides which fold the lower corners of the lining and means for withdrawing the plunger from the box.

5. In a machine for lining boxes, means for supporting a box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves hinged intermediate their ends in a horizontal plane above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger and having outwardly extending portions, said leaves being adapted to support a lining sheet superimposed thereon, means for moving the plunger downward into the box whereby it engages with the sheet upon the inwardly extending arms of the hinged leaves before the plunger enters the box, thereby turning said leaves upon their hinges, the outwardly extending arms of the leaves being thereby turned up and bringing the superimposed portions of the sheet up against the front and rear faces of the plunger, the lining sheet being of sufficient width to extend beyond the edges of the plunger, means for turning the extended side portions of the lining sheet against the two side faces of the plunger, whereby the lining sheet folded upon the plunger will be carried down into the box by the plunger and means for withdrawing the plunger from the lined box.

6. In a machine for lining boxes, means for supporting a box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves hinged intermediate their ends in a horizontal plane above

the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions one one side of the hinge which extend toward each other into the path of the plunger and having outwardly extending portions, said leaves being adapted to support a lining sheet superimposed thereon, means for moving the plunger downward into the box whereby it engages with the sheet upon the inwardly extending arms of the hinged leaves before the plunger enters the box, thereby turning said leaves upon their hinges, the outwardly extending arms of the leaves being thereby turned up and bringing the superimposed portions of the sheet up against the front and rear faces of the plunger, the lining sheet being of sufficient width to extend beyond the edges of the plunger, one of said leaves being provided with wings which engage the laterally extending portions of the lining on one face of the block and fold them up against two opposite edges of the block and guides which engage the laterally extending portions of the lining turned up by the other leaf and fold them against the side edges of the plunger, whereby the lining sheet is folded upon the plunger before the plunger is carried down into the box and means for withdrawing the plunger from the lined box.

7. In a machine for lining boxes, means for supporting the box to be lined, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves in the same plane with each other hinged intermediate their ends above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger, said leaves being adapted to support a lining sheet, means for moving the plunger downward into engagement with the lining sheet superimposed upon said leaves and down into the box beneath, thereby turning the leaves on their hinges and turning up the outwardly extending arms of the leaves with the superimposed portion of the lining sheet against two opposite sides of the plunger before the plunger enters the box, guides which fold the extended side portions of the lining against the remaining two sides of the plunger before it enters the box, guides which fold the lower corners of the lining, means for withdrawing the plunger from the box and pressure rollers which engage the folded sides of the lining upon opposite sides of the block to smooth it upon the block before it enters the box.

8. In a machine for lining boxes, means for supporting a box to be lined, a vertically

reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, two leaves hinged intermediate their ends in a horizontal plane above the box on opposite sides of the path of travel of the plunger and below the elevated position of the plunger, said leaves having portions on one side of the hinge which extend toward each other into the path of the plunger and having outwardly extending portions, said leaves being adapted to support a lining sheet superimposed thereon, means for moving the plunger downward into the box whereby it engages with the sheet upon the inwardly extending arms of the hinged leaves before the plunger enters the box, thereby turning said leaves upon their hinges, the outwardly extending arms of the leaves being thereby turned up and bringing the superimposed portions of the sheet up against the front and rear faces of the plunger, the lining sheet being of sufficient width to extend beyond the edges of the plunger, one of said leaves being provided with wings which engage the laterally extending portions of the lining on one side of the block and fold them up against two opposite edges of the block and guides which engage the laterally extending portions of the lining turned up by the other leaves and fold them against the side edges of the plunger, whereby the lining sheet is folded upon the plunger before the plunger is carried down into the box, means for withdrawing the plunger from the lined box and means for adjusting the folding plates to different distances apart to accommodate plungers of various sizes.

9. In a machine for lining boxes, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, means for folding the lining sheet against the plunger before it enters the box, means for moving the plunger with the lining folded thereon into the box, means for withdrawing the plunger from the box, a traveling carrier which moves the packages in a path which brings them into a position adjacent to the path of movement of the plunger, means connected with the mechanism for operating the plunger which moves a box from the position to which it was moved by the carrier to a position in alinement with the descent of the plunger, whereby the mechanism which controls the movement of the plunger controls the positioning of the box to be lined.

10. In a machine for lining boxes, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, means for folding the lining sheet around the plunger before it enters the box, means for moving the plunger with the lining folded thereon into the box, means for withdrawing the plunger

from the box, a traveling belt of greater width than the boxes and which moves in a path which passes horizontally beneath the vertical path of movement of the plunger, said belt being of sufficient width whereby a portion of the belt is outside of the path of the plunger, mechanism for controlling the movement of the plunger and a reciprocable member connected with the mechanism which controls the movement of the plunger having means connected therewith for moving one of the boxes on the belt which is outside of the path of movement of the plunger into a position on the belt in alinement with the path of the plunger and a stop which temporarily prevents the onward movement of other boxes and means for retracting said stop controlled by the reverse movement of the plunger.

11. In a machine for lining boxes, a vertically reciprocable plunger adapted to fit loosely within the box and reciprocable into and out of the box, means for folding the lining sheet around the plunger before it enters the box, means for moving the plunger with the lining folded thereon into the box, means for withdrawing the plunger from the box, a traveling belt of greater width than the boxes and which moves in a path which passes horizontally beneath the vertical path of movement of the plunger, said belt being of sufficient width whereby a portion of the belt is outside of the path of the plunger, a stationary right-angled plate just above the belt having two vertical walls, one of which extends upward parallel with the edge of the belt at one side of the path of the plunger, the other wall extending in a transverse direction of the belt partially across the same, a movable angle bar having two vertical walls at right angles with each other, one of which is parallel with one of the walls of the stationary angle plate and the other of which is parallel with the other wall of the stationary angle plate and means for reciprocating said movable angle plate whereby it moves a box into proximity to the stationary angle plate and forms a four-sided pocket for the box in position in alinement with the path of descent of the plunger.

12. In a machine for lining boxes, a reciprocable plunger adapted to shape the lining and carry it into the box to be lined, a movable plate adapted to position the boxes successively in alinement with the path of movement of the plunger, a stationary plate at one side of the lowermost position of the plunger and adjacent thereto, said movable plate when in its forward position and said stationary plate together forming a rectangular supporting cage for the box, means for reciprocating said movable plate, means for reciprocating said plunger and means for controlling the movements of the plunger and of the movable plate, whereby the mov-

able plate moves a box into its position beneath the plunger before the plunger has descended far enough to enter the box.

13. In a machine for lining boxes, a vertically reciprocable plunger which is reciprocable into and out of the box to be lined, means for actuating said plunger, means for supporting a lining sheet in position where it will be engaged by the plunger and carried by the plunger into the box, a traveling carrier-belt of greater width than the boxes and which moves in a path which passes beneath the vertical path of movement of the plunger, said carrier-belt being of sufficient width whereby a portion of the belt is outside of the path of the plunger, a stationary right-angled plate above the belt having two walls, one of which extends parallel with the edge of the belt and the other of which extends transversely of the belt partially across the same, a movable angle bar having two walls at right angles to each other, means for reciprocating said movable angle plate whereby it moves into proximity to the stationary angle plate and forms a four-sided pocket for the box and carries the box with it into position in alinement with the path of descent of the plunger and a latch which engages the box in its position beneath the plunger and retains it against being withdrawn by the reciprocating plate when the reciprocating plate is withdrawn.

14. In a machine for lining boxes, a reciprocable plunger, means for reciprocating the plunger so as to move it into and out of a box to be lined, means for supporting a lining sheet in a position to be engaged by the plunger and carried by it into the box, means for holding the box stationary while the plunger is moving into and out of it and means for introducing an air blast into the lined box between the lining and the plunger while the plunger is being withdrawn whereby the air blast operates to hold the lining in contact with the box in opposition to the tendency of the lining to adhere to the plunger while the plunger is being withdrawn.

15. In a machine for lining boxes, a reciprocable plunger, means for reciprocating the plunger so as to move it into and out of a box to be lined, means for supporting a lining sheet in a position to be engaged by the plunger and carried by it into the box, said plunger being formed with a conduit

therethrough, means for introducing a blast of compressed air through the conduit in said plunger into the lined box between the lining and the plunger and means for controlling the movement of the plunger and the compressed air supply, whereby the compressed air will be introduced to the lined box while the plunger is being withdrawn from the box.

16. In a machine for lining boxes, a reciprocable plunger, means for reciprocating the plunger so as to move it into and out of a box to be lined, means for supporting a lining sheet in a position to be engaged by the plunger and carried by it into the box, said plunger being formed with a conduit therethrough, means for introducing a blast of air through the conduit in said plunger into the lined box between the lining and the plunger while the plunger is being withdrawn from the box.

17. In a machine for lining boxes, a reciprocable plunger adapted to move into and out of the box to be lined, two leaves hinged intermediate their ends in a horizontal plane above the box on opposite sides of the path of travel of the plunger, said leaves being adapted to support a lining sheet and being turned upon their hinges by the plunger to fold the lining upon the plunger and means for adjusting the folding plates to different distances apart to accommodate plungers of varying sizes.

18. In a machine for lining boxes, a plunger reciprocable into and out of the boxes to be lined, a traveling belt of greater width than the boxes and which moves in a path which passes beneath the plunger, said belt being of sufficient width whereby a portion of the belt is outside of the path of the plunger, mechanism which controls the movement of the plunger and also controls the movement of the boxes on the belt whereby the boxes on the belt outside of the path of the plunger are moved into a position in alinement with the path of the plunger and means for folding a lining upon a plunger before it enters the box.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM A. JOPLIN.

Witnesses:

WILLIAM A. COPELAND,
ALICE H. MORRISON.