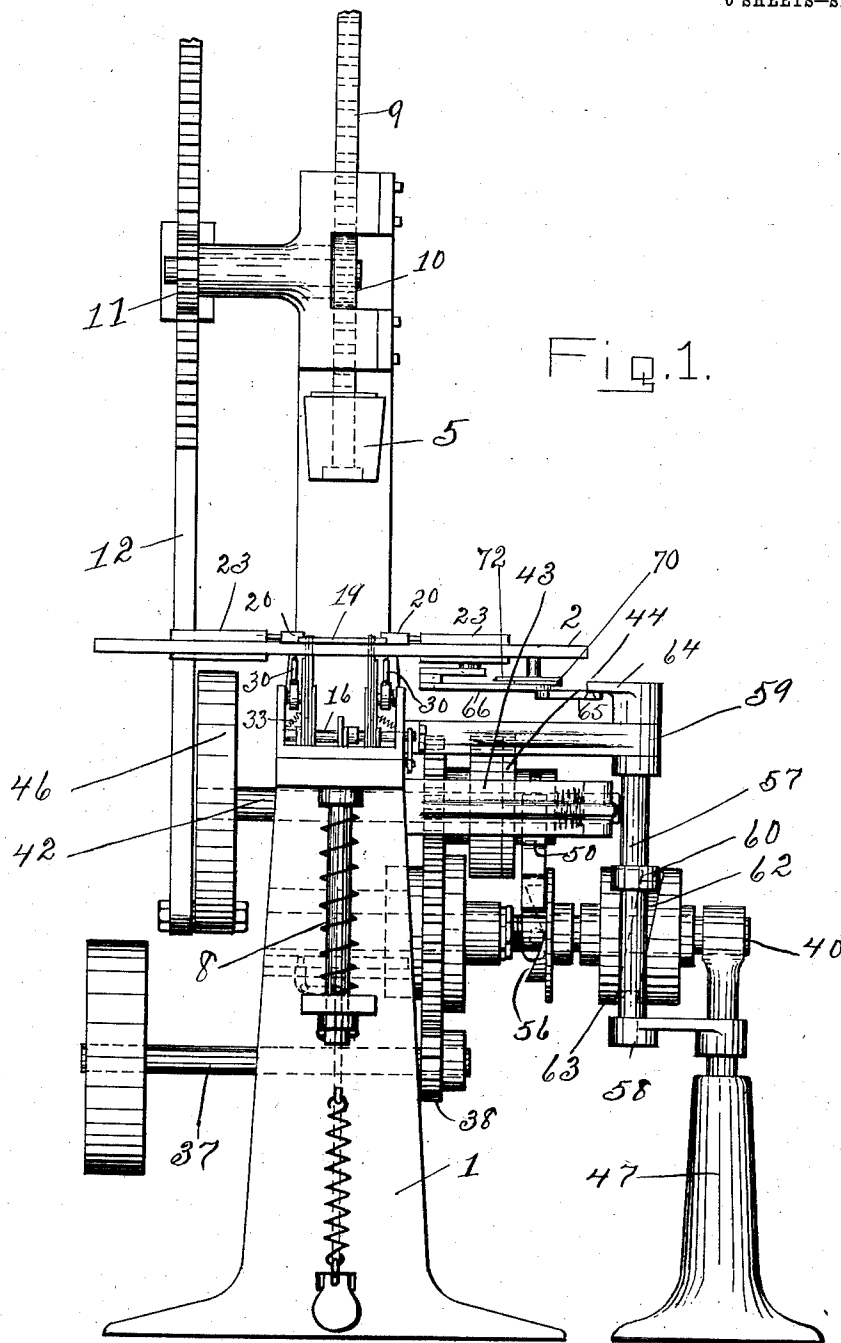


H. A. INMAN.
MACHINE FOR FORMING AND BAILING PAPER PAILS.
APPLICATION FILED MAY 3, 1911.

1,038,145.

Patented Sept. 10, 1912.

6 SHEETS—SHEET 1.



WITNESSES:

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J. E. Donsbach

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BY Frank C. Curtis

ATTORNEY

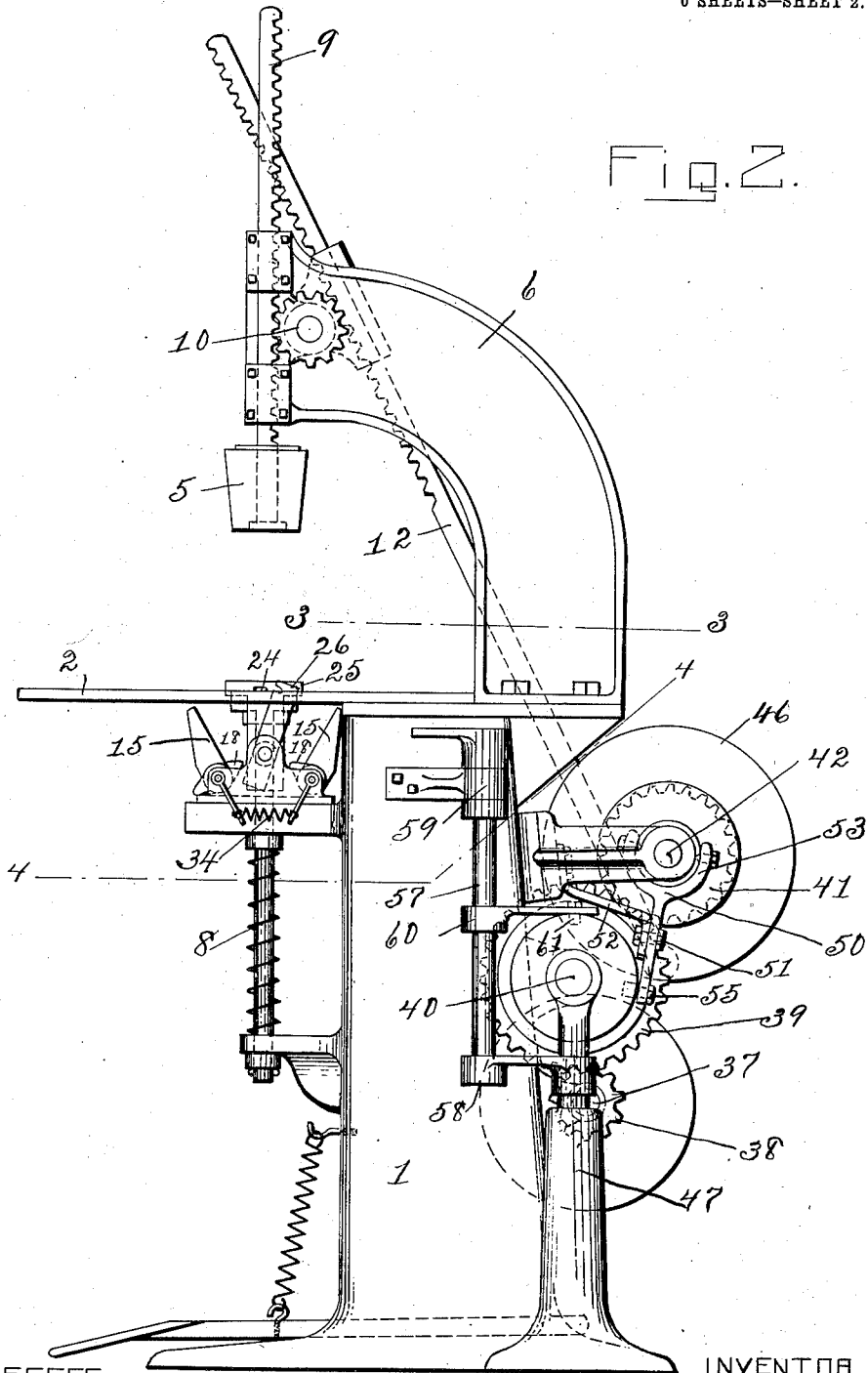
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6 SHEETS—SHEET 2.

FIG. 2.



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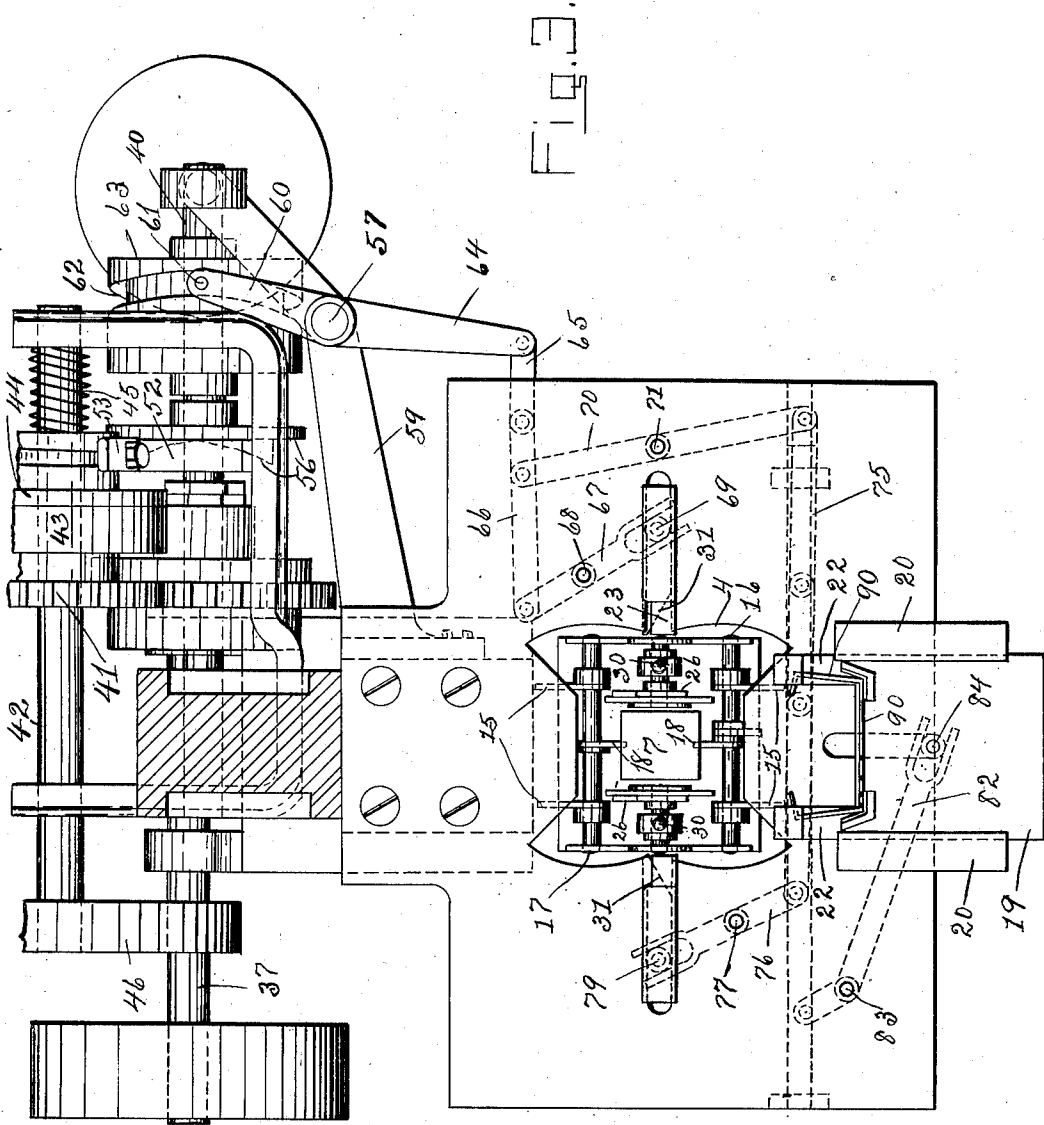
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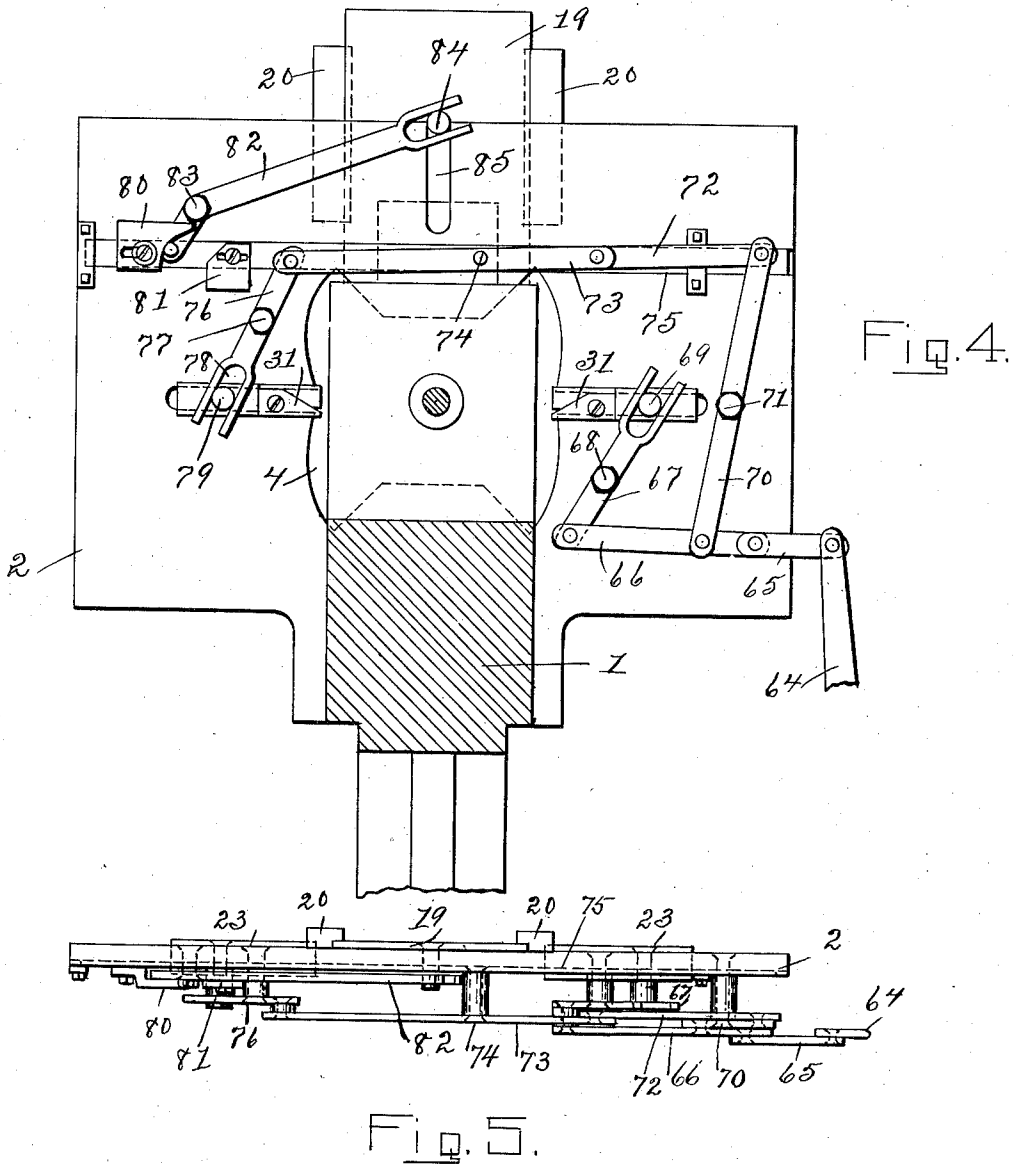
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6 SHEETS—SHEET 4.



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6 SHEETS—SHEET 5.

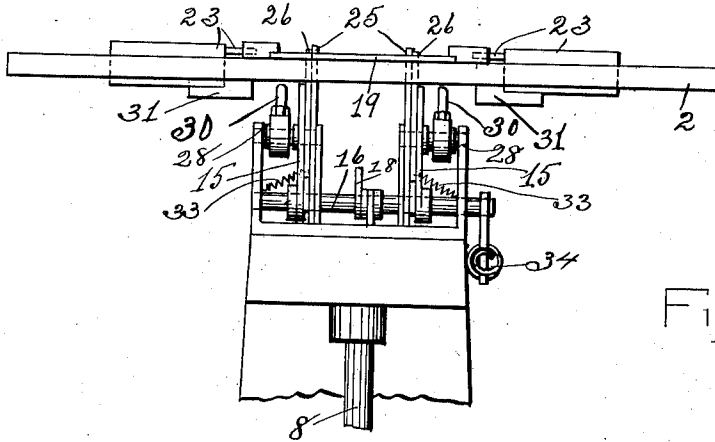


Fig. 6.

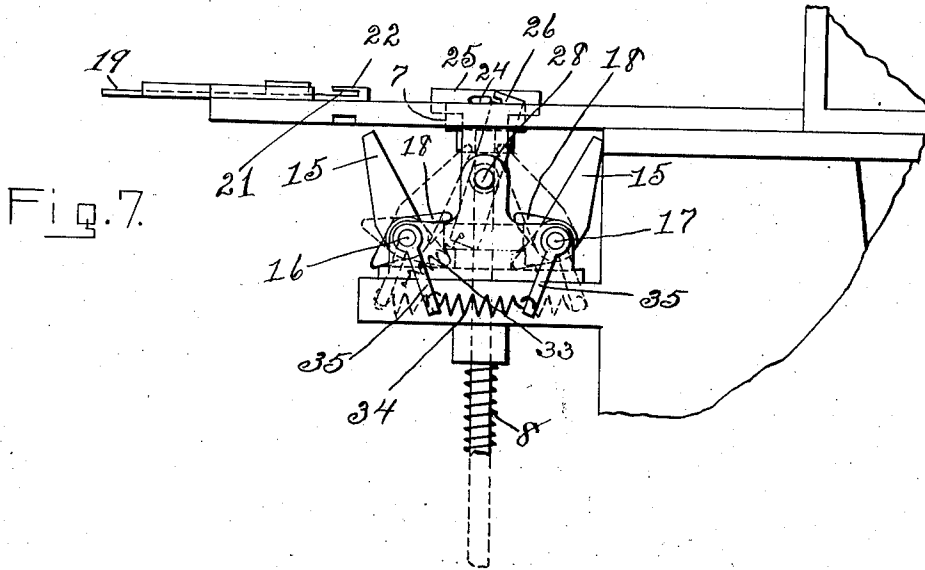


Fig. 7.

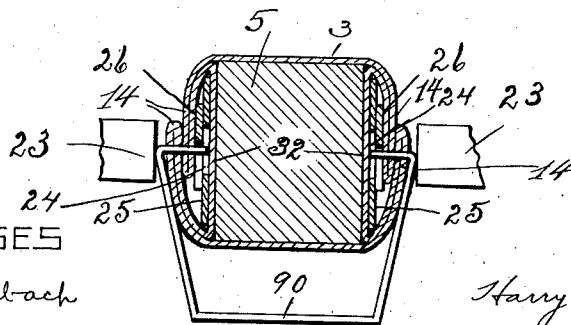


Fig. 9.

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6 SHEETS—SHEET 6.

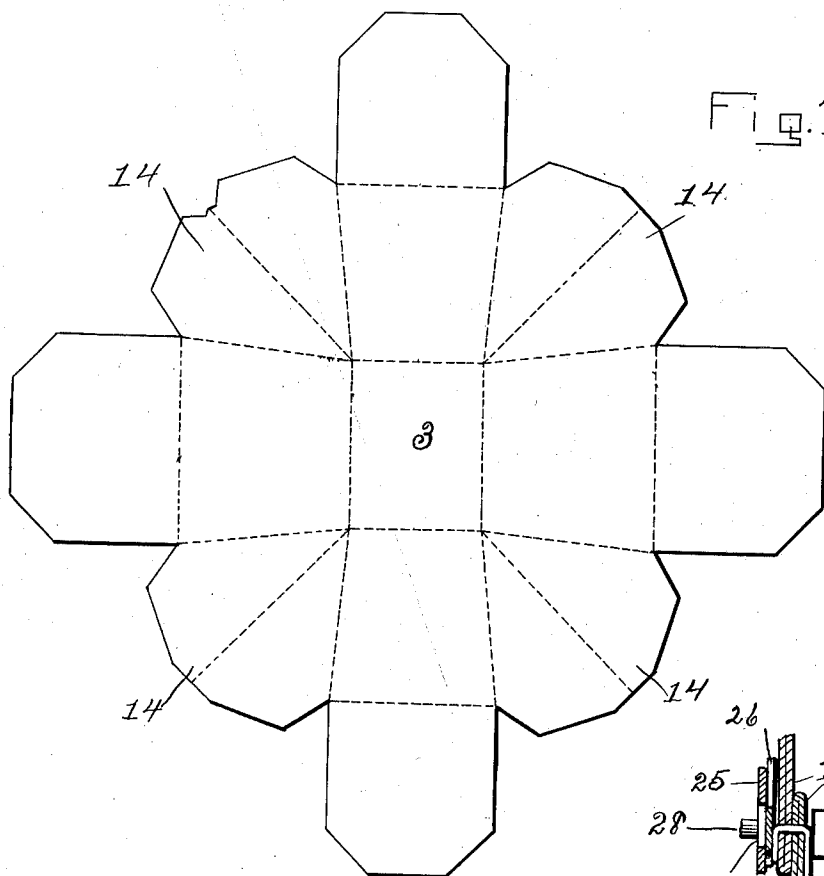


Fig. 11.

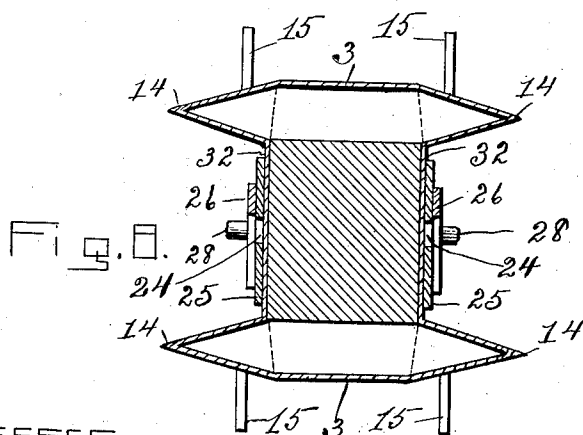


Fig. 10.

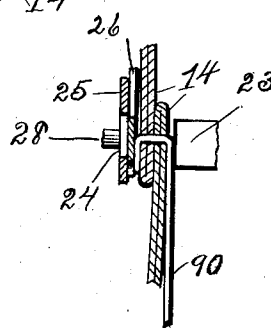


Fig. 10.

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UNITED STATES PATENT OFFICE.

HARRY A. INMAN, OF AMSTERDAM, NEW YORK.

MACHINE FOR FORMING AND BAILING PAPER PAILS.

1,038,145.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed May 3, 1911. Serial No. 624,812.

To all whom it may concern:

Be it known that I, HARRY A. INMAN, a citizen of the United States, residing at Amsterdam, county of Montgomery, and State of New York, have invented certain new and useful Improvements in Machines for Forming and Bailing Paper Pails, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification. Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in front elevation of my improved paper-pail-forming-and-bailing machine. Fig. 2 is a side elevation of the same. Fig. 3 is a horizontal cross-section of the same taken on the broken line 3—3 in Fig. 2, showing in top plan the bed-plate of the machine and certain of the operating-mechanisms. Fig. 4 is a horizontal section taken on the broken line 4—4 in Fig. 2, and showing in bottom plan the bed-plate and various link-and-lever-connections mounted upon the underside thereof. Fig. 5 is a view in front elevation of the parts shown in Fig. 4. Fig. 6 is a view in front elevation showing certain of the mechanisms on a larger scale than in Fig. 1. Fig. 7 is a view in side elevation showing certain of the mechanisms on a larger scale than in Fig. 2. Fig. 8 is a horizontal cross-section taken through the partly formed pail and the forming-mechanism. Fig. 9 is a similar view showing the folding operation completed and the bail-ends driven through the side-wings preparatory to clenching said ends. Fig. 10 is a similar view partly broken away, showing the bail-end clenching. Fig. 11 is a plan view of the blank from which the pail is formed.

This invention relates more particularly to a machine for automatically folding, and attaching bails to, paper-pails, such as the ordinary paper oyster-pail.

Certain objects of the invention are to automatically form or fold such a pail from a blank of paper-board previously cut to the proper outline, and creased along the proper fold-lines; to automatically attach to such a folded pail a wire bail, by which the same

can be carried; and to provide such a pail with a wire bail, the ends of which are not exposed on the interior of the pail.

Other objects will appear in connection with the following description.

Referring to the drawings wherein the invention is shown in preferred form, 1, represents the base of the machine and, 2, a bed-plate or table fixedly mounted thereon and adapted to support the blank, 3, (shown in Fig. 11) preliminary to the folding operation, and to cooperate with the other mechanisms in folding the blank to proper form. The bed is provided with an aperture, 4, down through which the blank is adapted to be forced by a head or plunger, 5, vertically reciprocatory in slideways in an overhanging arm, 6, erected from the base of the machine. A yielding bed, 7, is supported by means of a spring-post, 8, within the opening, 4, in the bed-plate in line with the plunger-head, 5, said yielding bed being adapted to support the central part of the blank which forms the bottom of the pail, and which is held clamped between said yielding bed and the plunger-head, 5, during the folding operation. The plunger-head, 5, is mounted upon the lower end of a toothed slide-rack, 9, which is engaged by a pinion, 10, fixed upon the same shaft with a pinion, 11, adapted to be engaged by a toothed rack on the crank-rod, 12, connected with a crank-disk, 13, operated in a manner hereinafter described, whereby a reciprocating vertical movement is imparted to the plunger-head 5. As the plunger-head, 5, descends through the opening, 4, in the bed-plate, the bottom of the box is clamped between said plunger-head and the yielding bed, 7, and the blank is drawn down within the aperture, 4, the walls of which serve to upturn the side-portions of the blank and partly fold the same to approximately the cross-sectional form shown in Fig. 8. A pair of side-wings or flaps, 14, are thus formed on each side of the pail, which wings require to be folded in from the position shown in Fig. 8 to that shown in Fig. 9, so that the wings of each pair shall lap each other. This is accomplished toward the latter part of the descending movement of the plunger-head, 5, by means of two pairs of oscillatory arms, 15, one of each pair being mounted upon a rock-shaft, 16, and the other of each pair upon a par-

allel rock-shaft, 17, which rock-shafts have fixed thereon, respectively, rocker-arms, 18, which project into the path of the descending yielding bed 7. The final descending movement of the bed, 7, forces down the rocker-arms, 18, thereby rocking the shafts, 16 and 17, to force the arms, 15, inward to fold the wings, 14, to the sides of the pail, as shown in Fig. 9. This completes the folding or shaping of the pail, which can be removed from the machine by raising the plunger-head, 5, and stripping the folded pail therefrom.

In adapting the machine for automatically attaching the wire bails to the pails, I provide a carrier and holder for the bail in the form of a slide, 19, reciprocatory in slideways, 20, on the bed-plate, and having a pair of arms, 22, adapted to freely receive therebetween the folded pail, the body of the slide and said arms being formed with seats to receive a wire bail, 90, which can be placed thereon by hand. The seats for the ends of the bail on the arms, 22, are undercut at, 21, so as to overhang the ends of the bail. Suitable means which will be presently described are provided for automatically imparting to the slide, 19, inward and outward movements at proper times.

The inward movement of the slide, 19, is so timed that the bail-ends are brought opposite the lapping portions of the side-wings, 14, on the respective sides of the box upon the completion of the folding of said side-wings, and when thus located each of said bail-ends is engaged by a plunger, 23, which drives the end of the bail through the lapping side-wings and into an opening, 24, in a stationary upright folder, 25, which coöperates with the plunger-head to fold upward the side-walls of the body of the pail. Each of the upright folders, 25, is supported only at its lower end and has its upper end projecting freely into the aperture in the bed with a free space on all sides between its free end and the walls of said aperture. As the bail-end is thrust through the lapping side-wings, 14, it is engaged by a clenching-arm, 26, which bends back upon itself the end of the bail to form a hook thereon, as shown in Fig. 10, said hook being flattened or closed by compression between the clenching-arm, 26, and the plunger, 23, during the final movement of said plunger.

The clenching-arm, 26, is fixed upon a rock-shaft, 28, upon which shaft is also fixed a stud, 30, located in the path of a cam or wedge-shaped member, 31, in fixed relation to the plunger, 23, so that as the plunger, 23, moves inward to force the bail-end through the side-wings of the pail, the cam, 31, will be forced against the stud, 30, causing a rocking movement of the rock-shaft, 28, whereby the clenching-arm, 26, is moved across the path of the inserted end of the

bail, serving to clench the same as above described.

The thickness of the clenching-arm, 26, and the upright folder, 25, is sufficient to prevent the end of the bail from penetrating the side-wall, 32, of the body of the pail, as will be seen in Fig. 9. The stock itself of the lapping side-wings affords sufficient support to the bail-wire to enable the clenching-arm, 26, to bend the end of the bail-wire to hook-form as above described.

When the bailing operation has been completed, the plungers, 23, with their wedges, 31, are withdrawn, permitting the clenching-arm to be returned to its initial position by means of the coil-spring, 33; the slide, 19, is moved back to its outermost position, and the plunger-head, 5, is raised, carrying upward with it the folded-and-bailed pail. As the rocker-arms, 18, are relieved from pressure by the rising of the bed, 7, the wing-folders are rocked back by means of a coil-spring, 34, which connects together a pair of rocker-arms, 35, fixed upon the respective rock-shafts 16 and 17.

As a means for accomplishing the necessary movements of the slide, 19, and plunger, 23, in proper time-relation with the descending and ascending motions of the plunger-head, 5, I provide connections whereby all of said mechanisms are driven from a common shaft 37. A pinion, 38, on the shaft, 37, engages a gear-wheel, 39, on a shaft, 40, rotatively mounted in bearings, respectively on the bed of the machine, and on the upper end of the stationary post 47. The gear-wheel, 39, meshes with a gear-wheel, 41, which runs loosely on a shaft, 42, which shaft is rotatively mounted in bearings on the frame of the machine.

In fixed relation to the gear-wheel, 41, is one member, 43, of an intermittent clutch, the other member, 44, of which is feathered upon the shaft, 42, and is forced into engagement with the clutch-member, 43, by means of a coil-spring, 45. When the clutch-member, 44, is held in engagement with the clutch-member, 43, by means of said coil-spring, the rotary movement of the gear, 41, will be transmitted to the shaft, 42, upon the end of which shaft, 42, is fixed a crank-disk, 46, with which is connected the crank-rod 12. The movable clutch-member, 44, is at certain times forced out of engagement with the clutch-member, 43, by means of a lever, 50, fulcrumed at, 51, upon a fixed bracket, 52, and having on its upper end a yoke, 53, engageable with the hub of the clutch-member, 44, and on its lower end a stud or cam-follower, 55, adapted to be engaged by a cam, 56, fixed upon the shaft 40. The cam, 56, is so shaped that upon the completion of the downward movement of the plunger-head, 5, the clutch is held open to permit the plunger-head, 5, to remain sta-

tionary during the bailing operation. A vertical rock-shaft, 57, is mounted at its lower end in a bracket, 58, projecting from the post, 47, and at its upper end in a bracket, 59, projecting from the base of the machine, said shaft having fixed thereon a rocker-arm, 60, upon the end of which is a cam-follower, 61, which occupies a cam-groove, 62, in a cam-wheel, 63, fixed upon the shaft, 40, whereby rocking movements are imparted to said shaft 57. A rocker-arm, 64, on the upper end of the shaft, 57, is connected by a short link, 65, with one end of a link, 66, the other end of which is connected with a lever, 67, fulcrumed at, 68, upon the underside of the bed-plate of the machine, and having a slotted end adapted to engage a stud or pin, 69, fixed to one of the plungers 23. The link, 66, is also connected with one end of a lever, 70, fulcrumed at, 71, upon the underside of the bed-plate, and having its other end connected by a link, 72, with one end of a lever, 73, pivotally connected at, 74, with a slide, 75, movable in a slideway on the underside of the bed-plate. The other end of the lever, 73, is connected with one end of a lever, 76, fulcrumed at, 77, on the underside of the bed-plate, and having a slotted end, 78, adapted to engage a stud or pin, 79, fixed to the other plunger 23. The lever, 73, being mounted upon the slide, 75, a movement of the link, 72, will impart a bodily movement not only to the slide, 75, but to the lever, 73, which is however free to rock upon its pivot, 74, to accommodate itself to the arc of movement of the end of lever, 76, with which it is connected. A pair of cam-shaped plates, 80 and 81, are mounted upon the slide, 75, in position to at certain times engage one arm of an angle-lever, 82, fulcrumed at, 83, upon the underside of the bed-plate, and having its other arm slotted and adapted to engage a stud or pin, 84, fixed to the slide, 19, which stud or pin, 84, projects down through a slot, 85, in the bed-plate.

The arms of the several levers are so proportioned as to accomplish the several movements in the order above described, and the cam-shaped plates, 80 and 81, are so located as to provide lost-motion in the operation of the lever, 82, at the beginning of the inward movement of the slide, 19, to allow a sufficient interval for the folding operation before the bail is moved into position for the bailing operation, and at the beginning of the outward or return movement of the slide, 19, to allow the necessary interval for the withdrawal of the plungers, 23, before the return movement of the slide begins.

I make no claim herein to the features above shown and described which pertain to the bailing-mechanism, as such features form the subject matter of an application

filed by me, December 8, 1911, Ser. No. 664,608, as a division of the present application.

What I claim as new and desire to secure by Letters Patent is—

1. In a machine for forming paper-pails or the like, and in combination, a head upon which the pail is formed; folding-mechanism comprising in part an upright folder coöperative with said head to fold a side of the pail, said upright folder being supported at its lower end, and having its upper end free; and a plate apertured to receive said head, and having certain of the walls of said aperture coöperative with said head to fold other sides of the pail, and certain other of said walls adapted to form lapping side-wings on the pail on the outer side of said upright folder, said upright folder projecting into said aperture with a free space on all sides between its free end and the walls of the aperture.

2. In a machine for forming paper-pails or the like, and in combination, a head upon which the pail is formed; a plate apertured to receive said head, and having certain of the walls of said aperture coöperative with said head to fold two sides of the pail, and certain other of said walls adapted to form side-wings on the pail; a support beneath said plate; a pair of upright folders mounted upon said support, and having free ends projecting into said aperture with a free space on all sides between said free ends and the walls of said aperture; and means for moving said head into and out of said aperture.

3. In a machine for forming paper-pails or the like, and in combination, a head upon which the pail is formed; means for imparting a reciprocating movement to said head; folding-mechanism comprising in part an upright folder coöperative with said head to fold one side of the pail; and means for infolding the side-wings of the pail on the outer side of said folder, said upright folder being supported at its lower end, and having its upper end free on all sides from said infolding means opposite said means, whereby it is adapted to permit the supported pail to be withdrawn from the folding-mechanism by the return movement of said head.

4. In a machine for forming paper-pails or the like, and in combination, an apertured plate having oppositely located edges for folding two sides of the pail, and other edges for forming a pair of wings for each of the other two sides of the pail; a pair of upright folders for folding said other two sides of the pail, said upright folders being supported at their lower ends below the level of said plate, and having their upper ends extending into said aperture with a free space on all sides between said fold-

ers and the walls of said aperture; a pair of arms movable toward each other on the outer side of each of said upright folders adapted to infold the side-wings of the pail to lapping position; and a reciprocating head adapted to carry a blank down through said apertured plate in folding the pail, and to withdraw the folded pail from said aperture by the return movement of said head.

10 5. In a machine for forming paper-pails or the like, and in combination, a head upon which the pail is formed; a yielding bed-plate coöperative with said head to clamp between them the bottom portion of the blank; means coöperative with said bed-plate and head to upturn the side-ports of the blank and form side-wings thereon; a pair of rock-shafts; wing-folding arms mounted upon the respective rock-shafts; 20 and rocker-arms mounted upon the respective rock-shafts in the path of said yielding bed-plate.

6. In a machine for forming and bailing paper-pails or the like, and in combination, 25 means for forming the pail comprising in part a pair of folder-plates provided with openings to receive the ends of a bail and means for infolding to lapping position the side-wings of the pail; means for supporting a bail with its ends opposite said side-wings and the openings in said folder-plates; means for driving the ends of the bail through said side-wings and into said openings; and means for bending the ends 35 of the bail.

7. In a machine for forming and bailing paper-pails or the like, and in combination, a bed-plate for the blank provided with an

opening; a pair of folder-plates located within said opening and provided with openings adapted to receive the ends of a bail; a head upon which the pail is formed movable through the opening in the bed-plate and coöperative with the walls thereof and with said folder-plates to upturn the sides of the pail and form side-wings thereon; wing-folders on the outer side of the respective folder-plates adapted to fold said wings to lapping position; means for supporting a bail with its ends opposite said side-wings and the openings in said folder-plates; means for driving the ends of the bail through said side-wings; and means for bending the ends of the bail. 40 45 50

8. In a machine for forming and bailing paper-pails or the like, and in combination, 55 pail-forming mechanism; bailing-mechanism comprising means for placing a bail in position and means for driving and clenching the ends of the bail; a drive-shaft; operating-connections between said drive-shaft and pail-forming mechanism comprising in part an intermittent clutch; automatic means for opening said clutch upon the completion of the forming of the pail; 65 and connections between said drive-shaft and the bailing-mechanism whereby the latter is operated in the interval while the clutch is open.

In testimony whereof, I have hereunto set my hand this 14th day of April, 1911. 70

HARRY A. INMAN.

Witnesses:

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