E. E. EUCHENHOFER.

BAILING MACHINE.

APPLICATION FILED MAY 10, 1909.

1,046,453.

Patented Dec. 10, 1912.

7 SHEETS—SHEET 1.

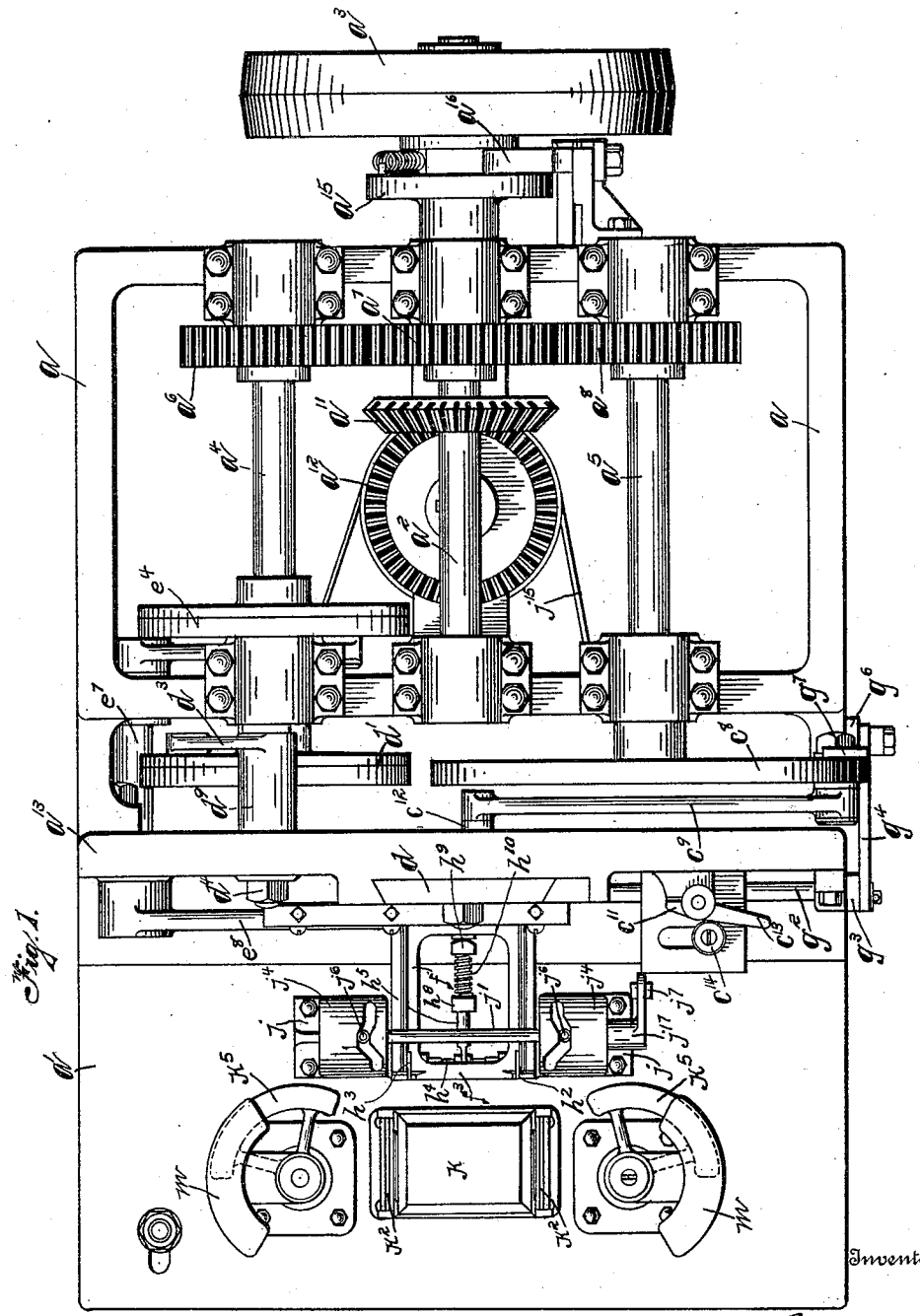

Fig. 1.

Witnesses

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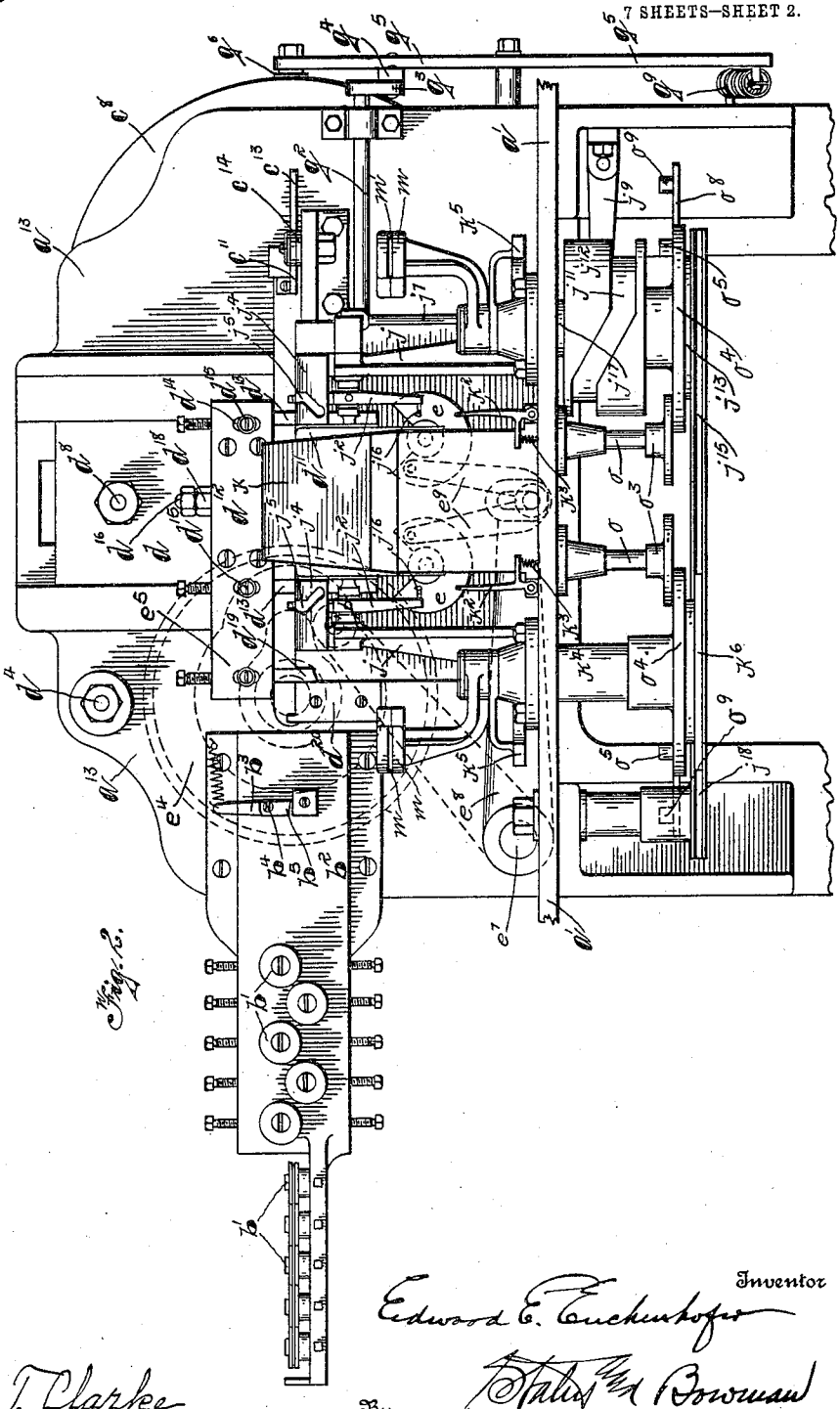

Fig. 2.

Witnesses

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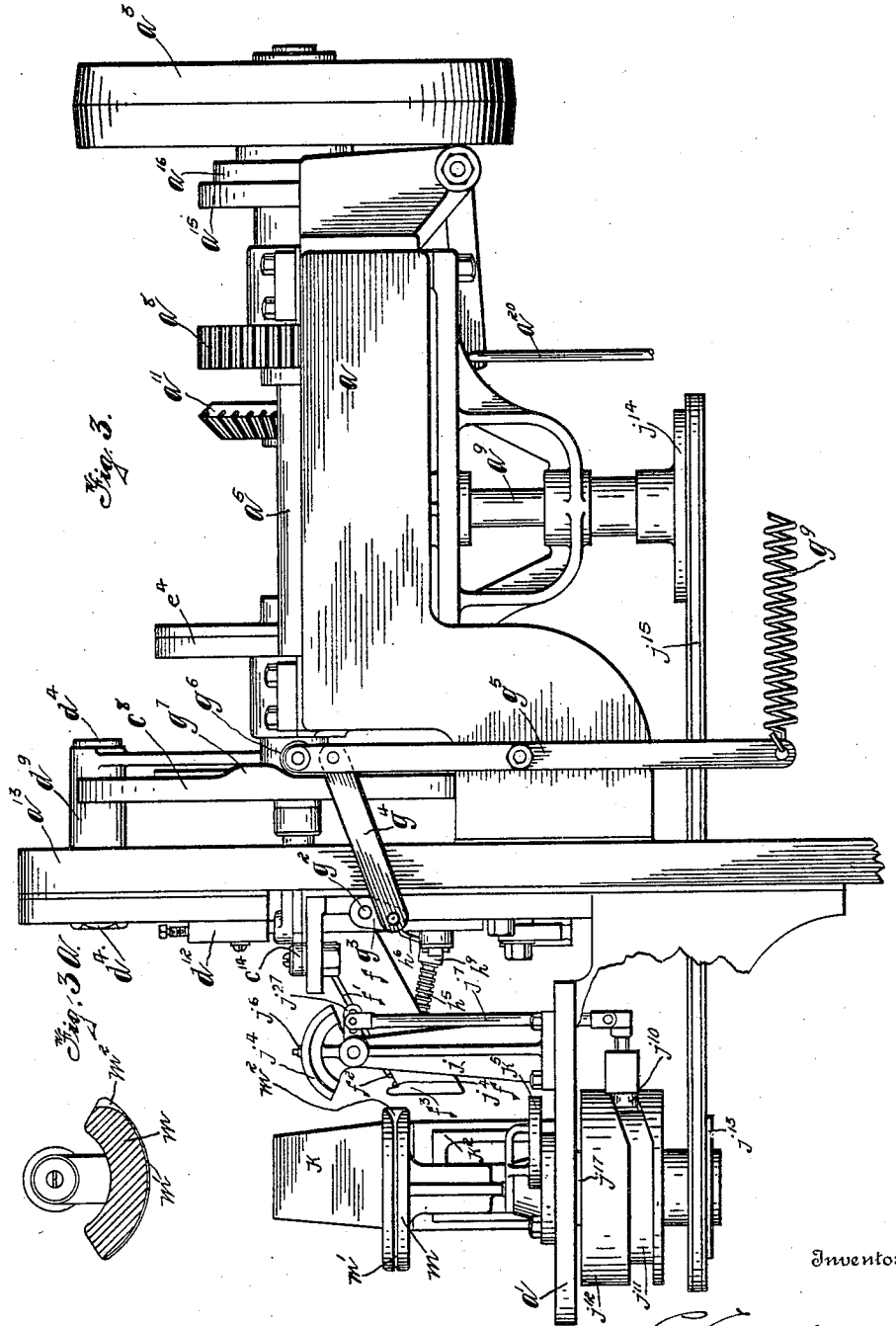

Fig. 3.

Witnesses

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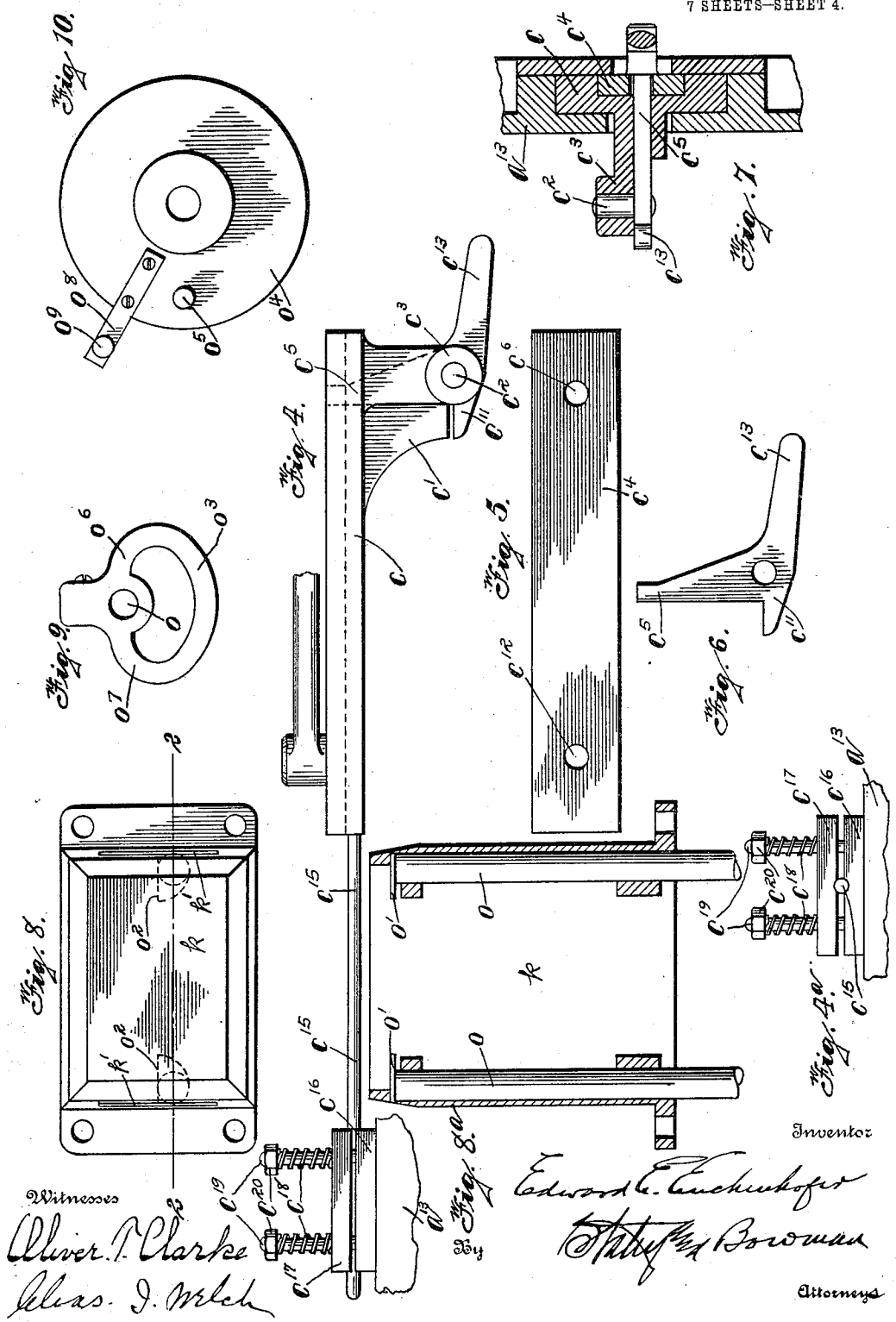

Witnesses

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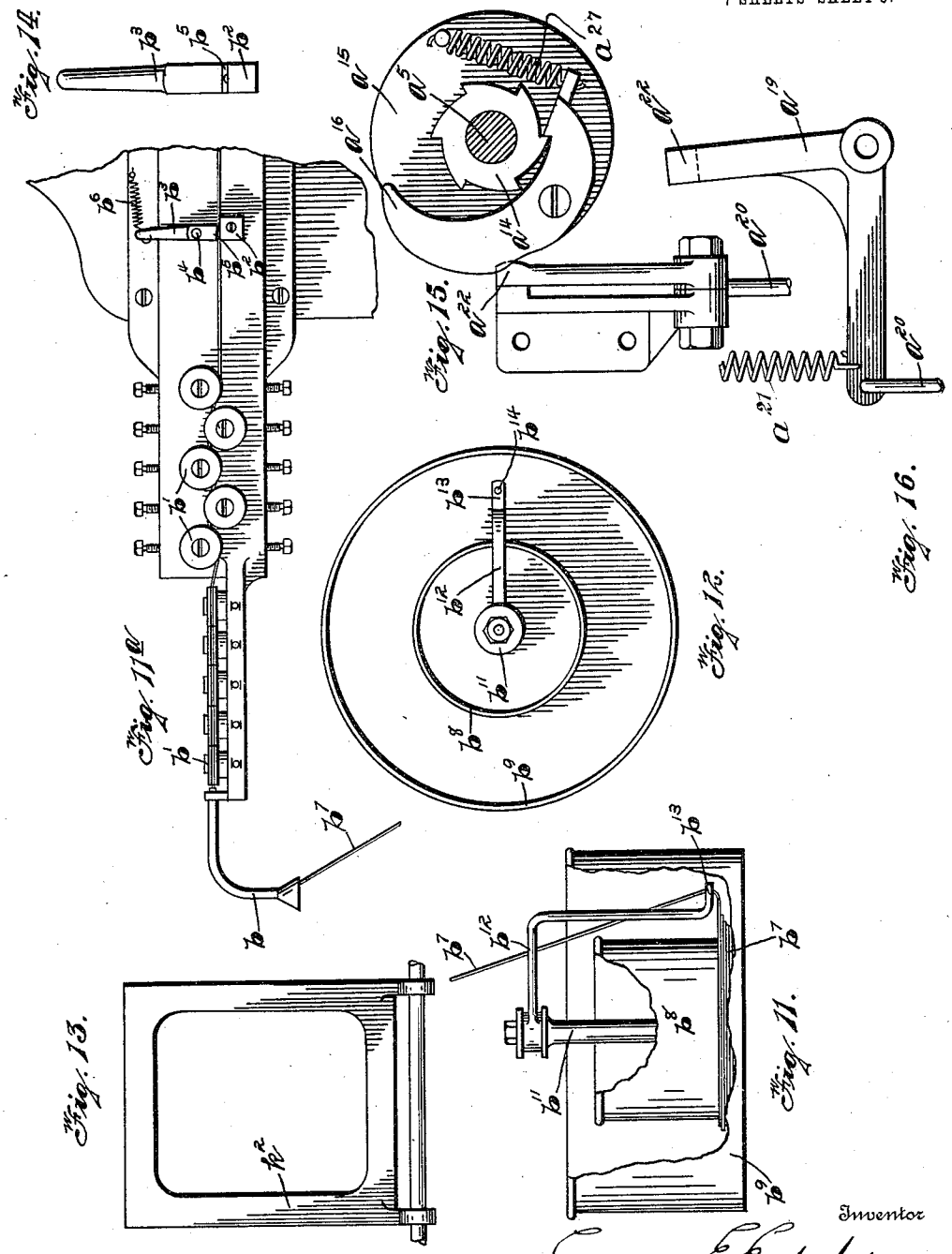

Witnesses

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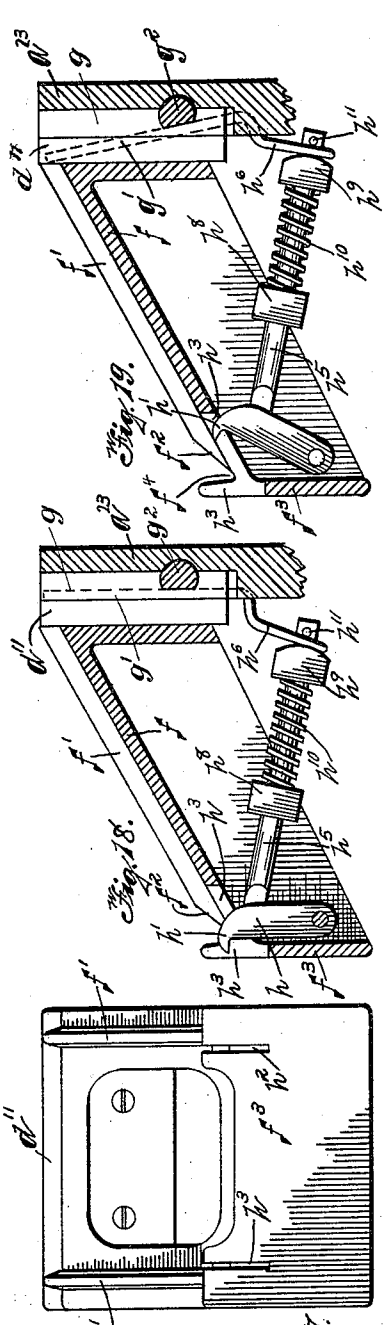

Fig. 19.

Fig. 18.

Fig. 17.

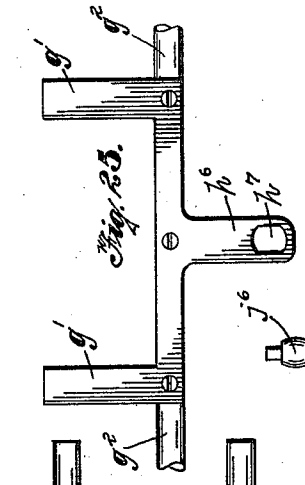

Fig. 25.

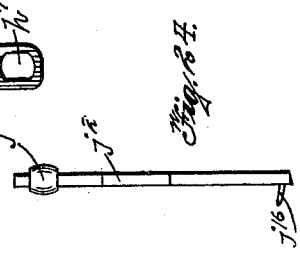

Fig. 24.

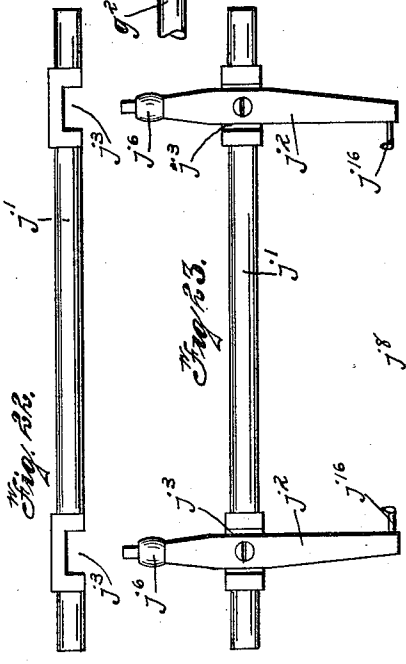

Fig. 22.

Fig. 23.

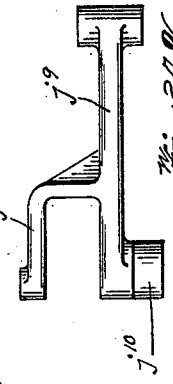

Fig. 24a.

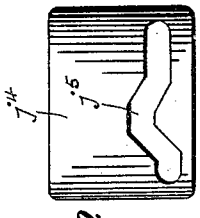

Fig. 20.

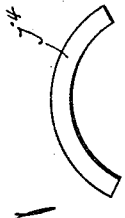

Fig. 21.

Witnesses

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APPLICATION FILED MAY 10, 1909.

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Patented Dec. 10, 1912.

7 SHEETS—SHEET 7.

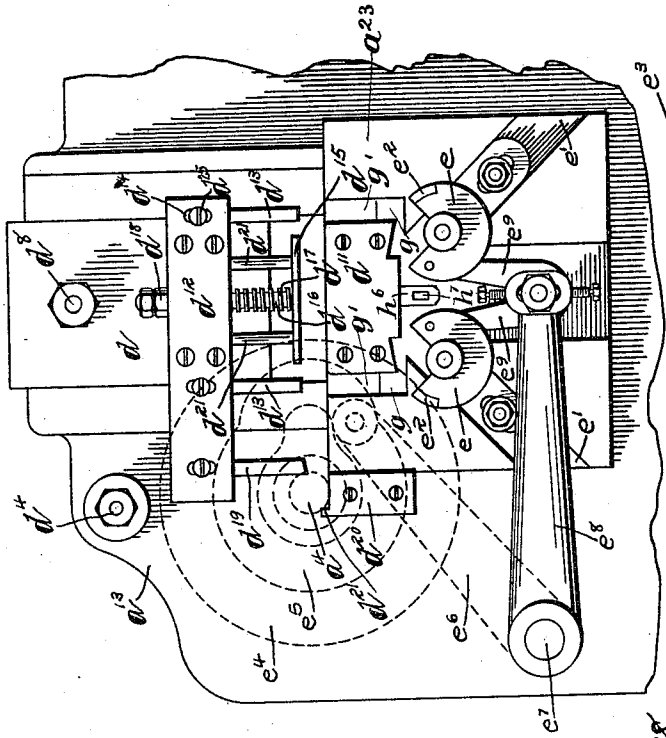

Fig. 29.

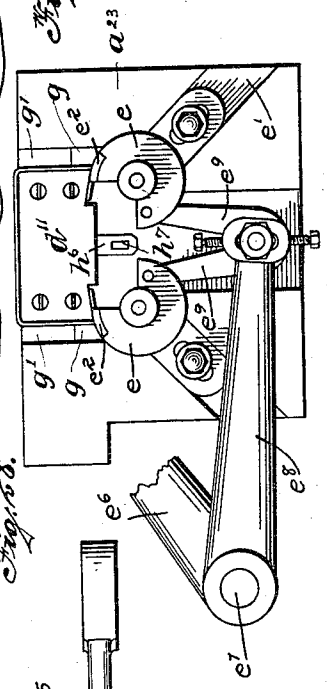

Fig. 28.

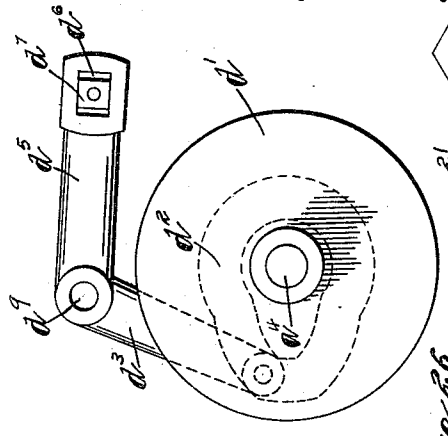

Fig. 27.

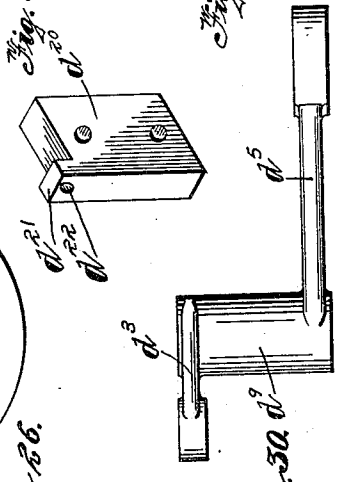

Fig. 31.

Fig. 26.

Fig. 30.

Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD E. EUCHENHOFER, OF DAYTON, OHIO, ASSIGNOR TO THE RIKE FOLDING BOX COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

BAILING-MACHINE.

1,046,453. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed May 10, 1909. Serial No. 495,088.

To all whom it may concern:

Be it known that I, EDWARD E. EUCHENHOFER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Bailing-Machines, of which the following is a specification.

My invention relates to improvements in bailing machines and particularly to that class of bailing machines which are especially adapted for securing wire bails to paper vessels.

The object of the invention is to simplify and make more effective the operation of machines of this kind.

The invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a machine embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation looking toward the left in Fig. 2. Fig. 3^a is a detail of one of the driving devices. Figs. 4, 4^a, 5 and 6 are details of the wire feeding device. Fig. 7 is a vertical sectional view of a portion of the supporting frame with the wire feeding device shown in position thereon. Fig. 8 is a top plan view of the support for the receptacle to be bailed and of the clenching devices. Fig. 8^a is a vertical sectional view of the same on the line 2—2 of Fig. 8. Figs. 9 and 10 are details of portions of the clencher operating mechanism. Fig. 11 is a front elevation of the supporting spool for the wire, the outer receptacle for the spool being partly broken away. Fig. 11^a is a front elevation of the wire straightening and holding device. Fig. 12 is a top plan view of the wire spool. Fig. 13 is a detail of one of the devices for holding the paper receptacle on its support. Fig. 14 is a detail of the wire holder. Figs. 15 and 16 are details of the clutch mechanism between the driving pulley and main driving shaft. Fig. 17 is a front elevation in detail of the incline for transferring the completed bail from the forming dies to the clencher mechanism and also of the devices for holding said bails in position to be clenched. Figs. 18 and 19 are vertical sectional views of the same showing the parts in different positions of operation. Figs. 20, 21, 22, 23, 24 and 24^a are details of the devices for bringing the bails into proper position for clenching. Fig. 25 is a detail of the kick-off device for starting the completed bails down the incline from the forming device to the holding and clenching devices. Fig. 26 is a detail of the cam for operating the head. Fig. 27 is a front elevation in detail of a portion of the bail forming device. Fig. 28 is a similar view showing the devices in a different position of operation. Fig. 29 is a detail of one of the forming devices shown in Figs. 27 and 28. Fig. 30 is a plan view of the rocker arm for operating the forming head. Fig. 31 is a detail of the stationary member of the wire cutter.

Like parts are represented by similar characters of reference in the several views.

Frame and driving mechanism.—a represents the main framework supported upon suitable legs (not shown) and having at its forward end a table or support, a^1, and also having at its forward end an upwardly extending supporting portion, a^{13}. Properly located in suitable bearings in the frame is the main driving shaft, a^2, receiving power from any suitable source through the medium of the driving pulley, a^3, located at the rear end of the shaft and adapted to be thrown into engagement with the same by the operator and to be automatically disengaged therefrom at the end of one complete revolution of the shaft, as will be more fully described hereinafter. Also located in suitable bearings in said main frame, on opposite sides of the main shaft, are two shafts, a^4 and a^5, receiving motion from said main shaft through the medium of the gears, a^6, a^7, a^8. Also located in suitable bearings, secured to the main frame, is a vertically-disposed shaft, a^9, receiving motion from the main shaft through the medium of beveled gears, a^{11} and a^{12}. All of these shafts constitute the main driving mechanism of the machine to which all of the operating parts are connected and receive their motion therefrom; these shafts being all preferably geared together so as to rotate at the same speed.

Wire holding device.—The coil of wire from which the bails are formed is located upon a spool, which will be described more fully hereinafter, and is fed therefrom through a guiding tube, b, formed with a

flaring mouth to and through the usual straightening rolls, b^1, located on an extension of the supporting frame portion, a^{13}, the construction and arrangement of these straightening rolls being well known and, therefore, need not be described here. From the straightening rolls the wire passes through a holding device (shown in detail in Figs. 11^a and 14), the function of which is to retain the wire in proper position to be grasped by the feeding device, the arrangement of the device being such as to permit the wire to pass freely through the same in one direction, but holding it against any movement in the opposite direction. This holding device consists of a stationary block, b^2, secured to the frame extension, and a swinging catch, b^3, located vertically above the block with its lower end in proximity thereto. The catch is eccentrically pivoted to the frame extension at b^4, and its lower end is beveled, as indicated at b^5. The direction of the bevel is toward the incoming wire and the spring, b^6, normally tends to swing the catch to the position shown in Fig. 11^a, in which position the wire is impinged between the edge of the lower end of the swinging catch and the block and thus held from backward movement, as any tendency of the wire to move backwardly by its own weight or otherwise will only tend to swing the catch, and thus more tightly impinge the wire. As the wire is drawn forwardly, however, the catch will be swung against the tension of its spring and thus bring its beveled surface in line with the upper edge of the block to provide a free passageway for the wire therethrough.

Feeding device for wire.—The feeding device for the wire is shown in Figs. 1, 4, 5, 6 and 7. It consists of a reciprocating carriage, c, having a fixed laterally-extended jaw or clamp, c^1, thereon and carrying a movable jaw or clamp, c^{11}, pivoted to a pin or trunnion, c^2, secured to a laterally-extending boss, c^3, on the carriage. On the inner side of the carriage is a grooveway which receives a slide, c^4. The movable clamping jaw, c^{11}, has a projecting finger, c^5, which extends through the boss and carriage and projects loosely into an opening, c^6, in the slide. The carriage is located and operates in a suitable longitudinally-extending grooveway, c^7, in the vertical portion, a^{13}, of the frame-work, with the respective jaw members extending laterally through the grooveway. The carriage is reciprocated back and forth by the disk, c^8, on the revolving shaft, a^5, which disk is pivotally connected to the stud, c^{12}, on the slide, c^4, by a link, c^9, (see Fig. 1). This slide serves to open and close the jaws, c^1 and c^{11}, owing to the connection of the movable jaw therewith, through the finger, c^5; it being understood that, as the carriage moves from right to left to the position where it grasps the wire, the jaws will be held open due to the fact that the pressure against the outer end of the finger, c^5, is such as to swing the movable jaw about its pivotal point, this movement being limited by the contact of the straight side of the finger against the fixed jaw portion, c^1, of the carriage. As the carriage starts upon its return movement, the pressure upon the finger will be in the opposite direction and will cause the jaws to close upon the wire, in a manner which will be readily understood. The movable jaw is also provided with an extending tail portion, c^{13}, adapted, near the limit of the return movement of the carriage, to contact with a friction roller, c^{14}, located at a suitable point upon the frame and thus rock the movable jaw so as to release the wire.

In the operation of the feeding device, it might happen that the jaws would not operate in some cases to properly clamp the wire; for instance, in a case where the carriage worked freely but the slide and movable jaw operated sluggishly by becoming gummed or for other reasons; it being understood that in such a case the first movement of the slide would not be independent of the carriage, but would carry the carriage with it, so that the jaw would not operate to engage the wire. In order to insure the proper clamping of the jaws upon the wire at each operation of the feeding device, I have provided a friction device for the carriage, shown in Figs. 1, 4 and 4^a. Connected to the carriage is an extending rod, c^{15}, which slides between a friction device consisting of a stationary part, c^{16}, secured to any suitable part of the frame, as the part a^{13}, and a movable part, c^{17}; springs, c^{18}, placed about pins, c^{19}, secured to the stationary part, bear against the movable part and yieldingly hold it against the rod. The tension of these springs may be adjusted by the nuts, c^{20}. By means of this device, the movement of the carriage will be retarded sufficiently to overcome any sluggish movement of the slide and jaw and thus insure the clamping of the wire before the carriage begins its movement.

Wire spool.—As before stated, the coil of wire which forms the bails is placed on a spool, shown in Figs. 11 and 12. The coil of wire, represented by b^7, is placed about a stationary spool, b^8, preferably inclosed by a receptacle, b^9, open at the top. Centrally located within the spool, which is hollow, is a vertical spindle, b^{11}, having journaled at its upper end a revolving arm, b^{12}, which projects laterally therefrom for a suitable distance and is then bent downwardly at right angles so as to extend into the receptacle and between the same and the spool, said arm terminating in a bent end, b^{13}, provided with an opening, b^{14}. The end of the

coil of wire is threaded through this opening and from thence to the guide tube, b, straightening rolls and feeding devices before described. As the wire is drawn from the spool it will be seen that the arm b^{12}, revolves around in the receptacle and thus keeps the wire from unwrapping from the spool any faster than is necessary, thus preventing the wire from becoming entangled. At the same time, it is obvious that a uniform tension is kept on the wire at all times and under all conditions.

Cutting and forming devices.—These devices are shown in Figs. 1, 2, 3, 26, 27, 28, 29, 30 and 31. Located in suitable guide-ways in the vertical portion, a^{13}, of the frame is a vertically reciprocating former head, d. Said head receives its reciprocating motion from a cam disk, d^1, secured to the shaft, a^4; said disk having a cam-way, d^2, (shown in dotted lines in Fig. 26) to receive a cam-roller, on the end of one arm, d^3, of a bell-crank lever, which is journaled on a rearwardly projecting stud, d^4, secured to the frame portion a^{13}. The other arm, d^5, of this bell-crank lever, has a slotted opening, d^6, to receive a block, d^7, on the end of a pin or stud, d^8, secured to the former head and projecting rearwardly therefrom. The bell-crank lever is provided with a central hub or sleeve, d^9, to receive the said stud, d^4, upon which the lever is journaled and the respective arms of said lever are offset or located in different planes with respect to each other.

Located a suitable distance below the former head and in line therewith is a stationary former block, d^{11}, secured to the frame portion a^{13}. Adjustably secured to the former head, or preferably to a portion, d^{12}, secured thereto, and on opposite sides thereof, are two downwardly projecting formers, d^{13} d^{13}, which stand in line with the sides of the former block, d^{11}, so as to stand flush therewith when in their lowermost position of operation; the side of each of said formers which stands adjacent to the side of the block being rounded out or grooved slightly to prevent cutting the wire and to receive the wire and hold it perpendicularly in line with the edge of the former block. The said portion, d^{12}, of the former head has slotted openings, d^{14} (Fig. 27) to receive screws, d^{25}, which secure the formers thereto so that said formers may be adjusted with respect to the head. Also secured to the portion d^{12} of said former head is a movable spring-pressed holder bar, d^{15}, in line with the upper edge of the block, d^{11}; said bar having a plunger, d^{16}, extending loosely through the portion d^{12}, with a nut d^{18} on its upper end, a spring, d^{17}, being placed about said plunger rod between the bar and the portion d^{12} of the head. The holder bar is preferably guided in its movement by the rods, d^{21}, extending upwardly therefrom and passing loosely through perforations in the portion, d^{12}.

The portion d^{12} of the head is extended toward the left and has secured at its end one member, d^{19}, of the cutter for the wire, the other member, d^{20}, being secured to the frame in a position so that its edge will cooperate with the member d^{19} to cut the wire at the proper time. The member, d^{19}, is preferably adjustably secured to the portion d^{12} in the same manner as described in connection with the formers. The stationary member, d^{20}, of the cutter, has an upwardly projecting lug or ear, d^{21} (shown in detail in Fig. 31), which has a perforation, d^{22}, therein to receive the wire. This perforation stands above the upper edge of the member, d^{20}, so that after the wire is cut the end of the wire will stand above the upper edge of said member so as to permit the jaws of the feeding device to properly grasp the end of the wire, said feeding device reciprocating across the frame as far as the cutter for this purpose.

Located beneath the block, d^{11}, and in line therewith are two bending wings, e e, suitably journaled on the end of two brackets, e^1 e^1, adjustably secured to the frame so the wings may be adjusted to different sized former blocks and also with reference to the block. Each of these wings has preferably secured thereto a hardened steel plate, e^2, provided with a notch, e^3, which, when the wings are operated, coöperate with the lower edge of the stationary block, d^{11}, to put the short bend in the bails. These wings are operated from the cam disk e^4, having a cam-way, e^5, to receive a cam roller on one end of a lever, e^6, secured to a rock-shaft e^7, located in suitable bearings in the frame-work. The forward end of the rock-shaft has secured thereto an arm e^8, the outer end of which is connected with the wings by the pivoted links, e^9.

A brief description of the operation of the device as thus far described is as follows: After the wire has been drawn across the machine by the feeding devices and released thereby in the manner described, the former head descends. The operating parts of the mechanism are so timed that the engagement of the holding bar, d^{15}, with the wire is practically simultaneous with the releasing of the end of the wire by the jaws of the feeding device, and the cutting member, d^{19}, is so positioned on the former head that the wire will be cut immediately after it is engaged by the holding bar. Immediately following the cutting of the wire the formers, d^{13} d^{13}, act to bend the wire about the sides of the former block to form the large bend, and immediately thereafter the forming wings, e e, operate to bends the ends of the

wire about the lower edge of the forming block to place the short bend therein. Following this operation the forming head begins its ascent and the wing recedes and the wire will be released by the holding bar, leaving the bail resting upon the forming block, d^{11}.

Kickoff and holding devices for bail.—Extending forwardly from the forming block, d^{11}, is a downwardly inclined track, f. (See Figs. 18 and 19 for detail.) This inclined track preferably has two V-shaped ribs, f^1 f^1, the upper edges of which stand flush with the upper edge of the former block and whose lower edges are beveled off as indicated at f^2, which lead down to the upwardly-extending forward wall of the inclined track, indicated by f^3, so as to form a channel, f^4, extending across the lower part of the incline. Located in a recess, g, in a plate a^{23} secured to the frame part, a^{13}, is what I term the "kickoff" for the bails, the function of which is to kick or push the bails from the forming block and start them down the incline to the channel, f^4, where they are held, picked up, driven through the paper bucket and clenched as hereinafter described. This kickoff is shown in detail in Fig. 25 and consists of two projecting arms, g^1 g^1, connected to a rockshaft, g^2; these arms normally lying immediately back of and in line with the sides of the forming block, d^{11}. As shown in Fig. 3, the rock-shaft has at one end a crank-arm, g^3, connected by a link, g^4, with a pivoted lever, g^5, the upper end of which has a cam roller, g^6, adapted to be engaged by a cam, g^7, on the disk, c^8, previously referred to. The lower end of the lever is connected to a spring, g^9, which is secured to any suitable point of the frame. Immediately after the bail has been formed, as previously described, this cam will operate the kickoff to push the bail from the forming block and cause it to slide down the incline to the channel, through the mechanism described.

At the lower end of the incline, on either side thereof, is a pivoted holding finger, h, provided with a hook-shaped end h^1, which normally stands across the channel, f^4, as indicated in Fig. 18; the incline and front wall thereof being provided with slots, h^2 and h^3, respectively, to accommodate the same. As shown in Fig. 1, these fingers are connected by a transverse rod, h^4, having a rearwardly-extending arm, h^5, which projects loosely through an opening, h^7, in the downwardly-extending projection, h^6, of the kickoff device, this projection, h^6, being positioned between a fixed pin, h^{11}, and a movable projection, h^9, on said arm, a spring, h^{10}, being placed about said arm and between the movable projection, h^9, and a fixed projection, h^8.

As the kick-off is operated by its cam, the fingers, h h, will be drawn back out of the channel, as indicated in Fig. 19. The cam will be of such length as to hold the fingers in this position until the bail has reached the channel, f^4, whereupon, by reason of the spring, g^9, the parts will return to their normal position, carrying with them the fingers, h h, to engage and hold the bail. By reason of the spring, h^{10}, and movable projection, h^9, it will be seen that the kick-off device will be allowed a movement independent of the fingers h; the spring, g^1, being stronger than the spring, h^{10}, which will be compressed slightly, so as to cause the fingers to yieldingly hold the bail in the channel, with the long bends of the bail hanging downwardly from the channel.

Pickup device for bails.—The support for the bucket to be bailed is located forward of the incline and in line therewith, as are likewise the driving and clenching mechanisms, and it is the purpose of the pick-up device to engage and swing the ends of the bails to the proper position to be driven through the bucket and clenched. Located on the table, a^1, at each side of the incline is a supporting standard, j, (see Figs. 1, 2 and 3) which support the transverse rock-shaft, j^1, on which are located the pick-up arms, j^2. (See Figs. 21, 23 and 24 for detail.) These arms are pivoted in recesses, j^3, in said shaft, so that said arms may not only have an outward swing, but also may swing laterally for the purpose to be described. Secured to the upper end of each standard is a curved plate, j^4, having formed therein a cam-way, j^5, (Figs. 20 and 22 for detail) into which cam-way projects the upper end of each pivoted pick-up arm; said arms having cam rollers, j^6, to engage the cam-way. Secured to the shaft, j^1, is a crank-arm, j^{27}, which is pivotally connected by a link, j^7, with an arm, j^8, of a lever, j^9, (Fig. 24^a); this lever, j^9, being pivoted to some suitable point of the frame, as shown in Fig. 2. The outer end of the lever carries a cam-roller, j^{10}, which engages in a cam-groove, j^{11}, of a cam-disk, j^{12}, secured to a vertical shaft, j^{17}, which shaft receives its motion from the vertical shaft, a^9, through the medium of the sprocket wheels, j^{13}, j^{14}, and chain, j^{15}.

In the operation of the pick-up device, as the cam depresses the lever, j^9, the shaft, j^1, will be rocked substantially one-fourth of a revolution, causing the arms, j^2, to swing outwardly and upwardly. The laterally projecting pins, j^{16}, on the lower ends of these arms normally stand out of the path of the bails as they slide down the incline, but as the arms begin to swing they will be also swung toward the incline by the action of the cam, j^5, to bring them into position to contact the bail and swing it about the point indicated by f^4, the fingers, h, h, and the

front edge of the incline acting as a pivot, until the ends of the bail stand adjacent the proper point of the paper bucket to be bailed.

Support for the paper receptacle.—The support for the paper receptacle to be bailed is shown in Figs. 1, 2, 3, 8 and 11, and consists of a hollow frame work shaped to conform to the shape of the receptacle. The support, indicated by k, is located on the table forward of the incline described and in line therewith. The sides of the support are provided with slots, k^1, for the purpose of receiving the ends of the bails, as hereinafter more fully described. Located on the table on each side of the support, k, is a presser finger, k^2, (see Fig. 13 for detail), normally spring-pressed away from the side of the support by a spring, k^3, as indicated in Fig. 2. Secured to the shaft, j^{17}, and also to a shaft, k^4, on the opposite side of the support, are circular segments, k^5, adapted, as the shafts are revolved, to contact the pressers, k^2, to cause them to spring in and press the folds of the paper receptacle against the support until the clenching operation has been completed; it being understood that those parts of the paper bucket blank which form the folding top will extend down the walls of the support to the position occupied by the pressers. The length of these segments is such that the presser fingers will be held against the folds of the receptacle until the clenching operation has been completed; the said fingers being swung back to their normal inoperative position by the springs as soon as the segments pass beyond the same. The shaft, k^4, is driven from the chain, j^{15}, through the medium of the sprocket wheel, k^6, this chain extending from the sprocket-wheel, j^{14}, about an idler sprocket, j^{18}, beneath the table, thence about the sprocket, k^6, thence across and about the sprocket, j^{13}, and thence back to the driving sprocket, j^{14}.

Driving devices.—Also located on the shafts j^{17} and k^4 are the drivers, m m. These drivers are each formed in the nature of a circular segment provided with a groove, m^1, gradually decreased in depth from its forward end rearwardly and having a flaring mouth at its forward end (see Figs. 2, 3 and 3^a), to center the ends of the wire bail and drive them through the walls of the paper receptacle. These drivers are located back of the presser segments, k^5, considering the direction of rotation of the shafts, so that the presser fingers will have engaged the sides of the paper receptacle before the driving operation takes place. The segments, m m, however, will perform their operation before the segments, k^5, release the presser fingers.

Clenching mechanism.—The clenchers proper, o^1, are located at the upper ends of vertical rock-shafts, o, located in suitable bearings on the inside of the support, k, as shown in Figs. 8 and 11. Each of the clenchers has a flat surface, o^2, normally standing at right angles to the slots, k^1, in the walls of the support. Secured to the lower end of each shaft is a cam-shaped projection, o^3, (see Figs. 2 and 9) which has two cam surfaces indicated by o^6 and o^7. On each of the shafts, k^4 and j^{17}, is a disk, o^4 o^4, provided with projections, o^5 and o^9. (See Figs. 2 and 10). These projections are out of line with each other and the projection, o^9, stands back of the other a suitable distance considering the direction of rotation of the disk, this projection being preferably placed on an arm, o^8, secured to the disk and stand flush with the surface thereof, as shown in Fig. 2. As soon as the drivers have driven the bails through the walls of the receptacle, the projections, o^5, contacting the cam surface, o^6, swing the shafts and the clenchers to cause the flat surfaces of the clenchers to engage and bend the projecting ends of the bails; it being understood that the slots, k^1, will stand opposite the point where the ends of the bails have been carried by the pick-up device. The length of the segments, k^5, is such that the clenchers, o^1, will have performed the clenching operation before the segments pass through the clenching point; the clenchers and segments coöperating together in the clenching operation. After the clenching operation takes place, the other projections, o^9, will contact the other cam surfaces, o^7, and swing the clenchers back to normal position.

Start and stop mechanism for driving devices.—As before stated, means are provided for giving the driving shaft an intermittent movement of one complete revolution. The start and stop devices are shown in Figs. 15 and 16. Secured to the continuously revolving pulley, a^3, is a ratchet wheel, a^{14}. Loose on the main shaft, a^5, and adjacent the ratchet wheel, is a disk, a^{15}, carrying a pivoted swinging dog, a^{16}, normally spring-pressed into driving relation with the ratchet wheel by a spring, a^{17}. Pivoted to a bracket, a^{18}, on the frame is a bell-crank lever, a^{19}, one arm of which has secured thereto a rod, a^{20}, connected to a foot treadle (not shown) and the other arm of which is normally held in the path of movement of the dog, a^{16}, by the spring, a^{21}. This latter arm has a beveled surface, a^{22}, with which the dog contacts so as to swing the dog from engagement with the ratchet and thus stop the driving mechanism. By depressing the foot treadle the beveled end of the bell crank lever is withdrawn from the path of the dog, permitting the dog to go to engaging position with the ratchet and revolve therewith for one complete revolution if the treadle is immediately released

or continuously if the treadle is held by the operator.

By the constructions described I have provided a machine in which the construction and operation is greatly simplified and improved over devices previously used. Further, a machine has been devised which requires very much less power to operate due to the fact that the operation of feeding, cutting and forming the bails, and the operation of carrying the bails to the driving and clenching mechanism and driving and clenching the same, are each distributed throughout substantially the entire movement of the main operating shaft. In explanation of this it might be stated that in prior devices the operation of feeding the wire, cutting and forming the wire, and driving and clenching the wire, follow each other in sequence so that each operation takes place during but a part of the revolution of the driving shafts which requires very sharp and abrupt cams to perform the operation. In my device, as previously stated, the operation is such that it may be more widely distributed throughout the movement of the operating shaft, so that longer cams, reduced gearing, etc., may be employed and hence a very considerable reduced power be required. This is due to the fact that at the time the forming devices are forming the bail, the driving and clenching devices will also be operating upon the previously completed bail; it being understood that the first complete operation of the machine is to first form a bail, the next succeeding operation not only forming another bail but also carrying the first bail to the driving and clenching devices and driving and clenching the same, so that, after the first operation of the machine, two bails are in the machine at the same time, one being formed and the other being clenched.

Having thus described my invention, I claim:

1. In a machine of the character described, wire cutting and forming mechanism, wire feeding mechanism, said wire feeding mechanism comprising a reciprocating carriage, a stationary jaw on said carriage, a movable jaw pivoted to said carriage, a slide movably connected to said carriage and having a connection with said movable jaw, and operating mechanism connected with said slide.

2. In a machine of the character described, wire cutting and forming mechanism, wire feeding mechanism, said wire feeding mechanism comprising a sliding carriage, a stationary jaw formed thereon, a pivoted jaw carried thereby, a movable slide also carried thereby, operating mechanism connected to the slide, a connection between the slide and movable jaw, and an arm on said movable jaw adapted to contact with a fixed projection on the frame, substantially as and for the purpose specified.

3. In a machine of the character described, wire cutting and forming devices, said devices comprising a stationary former block, clenching devices, and a support for the article to be bailed, an inclined track leading from said former block to said support, means for transferring the bail from said block to said track, means for holding the bails at the lower end of said track, and devices for swinging the ends of the bails to a position to be operated upon by said clenching devices, substantially as specified.

4. In a machine of the character described, bail cutting and forming devices, bail clenching devices, an incline between the same, and means at the upper end of the incline for starting the bails, and means at the lower end of the incline for bringing the bails into position to be clenched by said clenching devices, substantially as specified.

5. In a machine of the character described, bail cutting and forming devices, bail clenching devices, a track for the bails between the same, and means for pushing the bails from the former devices onto one end of said track, and means at the other end of said track for bringing the bails into position to be operated upon by said clenching devices, substantially as specified.

6. In a machine of the character described, bail cutting and forming devices, bail clenching devices, an inclined track between the same, a kickoff for the bails at the upper end of said track, a holding device for said bails at the lower end of said track, and pickup devices adapted to swing the ends of the bails into position to be operated upon by said clenching devices, substantially as specified.

7. In a machine of the character described, bail cutting and forming devices, bail clenching devices, an inclined track between the same, a kickoff device at the upper end of said track for starting the bails down said inclined track from said forming devices, a holding device at the lower end of said track for said bails having an operative connection with said kickoff device, and a pickup device for the ends of the bails adapted to swing the same around in said holding device to a position to be operated upon by sail clenching devices.

8. In a machine of the character described, bail cutting and forming devices, bail clenching devices, an inclined track between the same, a kickoff for the bails located at the upper end of said track, a holding device for the bails located at the lower end of said track, said holding device having an operative connection with said kickoff device, the connection being such that said kickoff device may have a movement independent of said holding device, and means for carrying

the ends of said bails into position to be operated upon by said clenching devices, substantially as specified.

9. In a machine of the character described, bail cutting and forming devices, bail clenching devices, a holding device for the bails, means for delivering the bails to said holding device and means for carrying the ends of the bails to the clenching device, and means for operating said holding device into and out of operative position, said operating means being capable of movement independent of said holding device, substantially as specified.

10. In a device of the character described, bail cutting and forming devices, bail clenching devices, means for delivering the bails from said cutting and forming devices to said clenching devices, said means comprising two pivoted arms normally standing out of the path of movement of said bails in their travel from the cutting and forming devices to the clenching devices, and means for operating said arms to bring them into position to engage said bails and then swing said bails to a position to be operated upon by said clenching devices, substantially as specified.

11. In a device of the character described, bail cutting and forming devices, bail clenching devices, an inclined track between said devices, means for delivering said bails from the forming devices to the lower end of said inclined track, means for holding said bails at the lower end of the track, and pickup devices for swinging said bails into position to be operated upon by said clenching devices, said pickup devices comprising two pivoted arms normally lying out of the path of movement of said bails during their travel on the track, together with means for swinging said bails into position to be clenched by said clenching devices, substantially as specified.

12. In a device of the character described, bail cutting, forming and feeding devices, bail clenching devices, an inclined track between said devices, means for discharging the bails from the forming devices onto said track, a channel at the lower end of said track, pivoted fingers to engage one portion of the bail and hold it in said channel, and pickup devices for swinging the ends of the bails into position to be operated upon by said clenching devices.

13. In a machine of the character described, wire feeding devices, means for cutting the wire, wire forming devices, wire clenching devices, said forming devices comprising a stationary former block and a single movable former head, said head having two formers thereon coöperating with said block to bend the wire along the sides of said block, and two pivoted formers located at the lower end of the said block and coöperating therewith to bend the ends of the wire about the lower edge of said block, and means for delivering the bails from said forming devices to the clenching devices, substantially as specified.

14. In a machine of the character described, wire feeding mechanism, wire cutting and forming devices, said devices comprising a single movable head and a stationary block, said head carrying one member of the cutting device and also two formers coöperating with said block to bend the wire along the sides of said block, and two formers located at the lower end of said block and coöperating therewith for bending the ends of the wire, clenching devices, and means for delivering the bails to said clenching devices, substantially as specified.

15. In a machine of the character described, wire feeding mechanism, wire cutting and forming devices, an inclined track leading from said devices, and means for discharging the bails onto said track from said forming devices.

16. In a machine of the character described, wire feeding mechanism, a wire cutter, bail forming devices, said forming devices comprising a stationary vertically arranged block, an inclined track leading from the top of said block, a discharging device normally located back of said block, and means for operating said discharging device to discharge the completed bail from said block onto said track, clenching devices, and means for carrying said bails to said clenching device from said track.

17. In a machine of the character described, wire feeding mechanism, cutting and forming devices, a stationary support for the article to be bailed, means for delivering the ends of the bail to position with respect to said support, means for holding the flaps of the article to be bailed, and means for clenching the bail, substantially as specified.

18. In a machine of the character described, wire feeding mechanism, cutting and forming devices, a stationary support for the article to be bailed, means for delivering the ends of the bails to position with respect to said support, a holding device for the flaps of the article, a driving device for the bails, and means for clenching the bails, substantially as specified.

19. In a machine of the character described, wire feeding mechanism, cutting and forming devices, a support for the article to be bailed, means for delivering the bails thereto, means for clenching the bails, and a presser device to hold the flaps of the article while being bailed, said presser device comprising two pivoted devices normally spring-pressed away from the sides of the support together with means for pressing the same against the sides of the

support during the bailing operation, substantially as specified.

20. In a machine of the character described, wire feeding, cutting and forming devices, a support for the article to be bailed, means for delivering the bails to said support and holding the same in position to be bailed, means for clenching the bails, and means for holding the flaps of the article during the clenching operation comprising two pivoted pressers on opposite sides of the support normally spring-pressed away from said support, and two revoluble segments to contact therewith and press and hold the same against the sides of said support, substantially as specified.

21. In a machine of the character described, wire feeding, cutting and forming devices, a support for the article to be bailed, means for delivering and holding the bails in position to be clenched, driving devices comprising a revoluble segment on each side of said support, and pivoted clenchers on the inside of said support, substantially as specified.

22. In a machine of the character described, wire forming devices, driving devices and clenching devices, said driving devices comprising a revoluble segment each provided with a groove-way having a flaring mouth, substantially as specified.

23. In a machine of the character described, forming devices, driving devices and clenching devices, said driving devices comprising revoluble segments each having a groove-way, said groove-way being gradually decreased in depth to the rear and being provided with a flaring mouth at the front, substantially as specified.

24. In a machine of the character described, wire feeding, cutting and forming devices, a support for the article to be bailed, means for delivering and holding the bails in position to be clenched, a revoluble shaft on each side of said support, two segments located on each shaft, a holding segment and a driving segment, said holding segment being located in advance of the driving segment, spring-pressed devices coöperating with said holding segment to press the flaps of the article against said support, and clenching devices on the inside of said support coöperating with said driving segment, substantially as specified.

25. In a machine of the character described, a main driving shaft, means for imparting to said device a uniform intermittent movement; feeding, cutting and forming mechanism; operating devices for the same connected to said shaft; driving and clenching mechanism; separate operating devices for the same also connected to said shaft; the formation of and connection of the respective operating devices to said shaft being such that their operation will be entirely independent of each other and will be distributed throughout substantially during a complete revolution of said shaft, substantially as specified.

26. In a machine of the character described; a main driving device, means for imparting to said device a uniform intermittent movement; feeding, cutting and forming mechanism, operating devices for said mechanism, said operating devices being so formed and connected to said driving device as to distribute the operation of said mechanism throughout substantially the entire movement of said device; and driving and clenching mechanism, operating devices for the same, said latter operating devices being so formed and connected to said driving device as to distribute the operation of the driving and clenching mechanism throughout substantially the entire movement of said driving device, substantially as specified.

27. In a machine of the character described; a main driving device, means for imparting to said device a uniform intermittent movement; feeding, cutting and forming mechanism, cam, gear and crank devices for operating said mechanism, said devices having an operative connection with said driving device, and being so formed as to distribute the operation of said mechanism throughout substantially the entire movement of said driving device; driving and clenching mechanism, operating devices for the same comprising a series of cams and gears, said cams and gears being so formed and connected to said driving device as to cause the operation of said driving and clenching mechanism to be distributed throughout substantially the entire movement of said driving device, substantially as specified.

28. In a machine of the character described, a main driving device, means for imparting to said device a uniform intermittent movement; feeding, cutting and forming mechanism, operating devices for said mechanism; driving and clenching mechanism, operating devices for said last-mentioned mechanism; and devices for delivering the bail from the forming mechanism to said driving and clenching mechanism, all of said mechanisms and devices being so formed and connected to said driving device as to cause the operation thereof to be distributed throughout substantially the entire movement of said driving device, substantially as specified.

29. In a machine of the character described, a main driving device; means for imparting to said device a uniform intermittent movement; feeding, cutting and forming mechanism; driving and clenching mechanism, mechanism for delivering the bails from the forming mechanism to the

driving and clenching mechanism; operating devices for each of said mechanisms; said mechanisms and operating devices being so formed and connected with said driving device as to distribute the operation thereof throughout substantially the entire movement of said driving device, substantially as specified.

30. In a machine of the character described, a main driving device, means for imparting to said device a uniform intermittent movement; feeding, cutting and forming mechanism, devices for operating the same; driving and clenching mechanism and mechanism for delivering the bails from the forming mechanism to the driving and clenching mechanism, devices for operating the delivery mechanism and the driving and forming mechanism in sequence; all of said mechanisms and devices being so formed and connected with said driving device as to cause the operation thereof to be distributed substantially throughout the entire movement of said driving device, substantially as specified.

31. In a machine of the character described, a main driving device, means for imparting to said driving device a uniform intermittent movement, bail forming devices, bail clenching mechanism, and mechanism for delivering the bails from the forming mechanism to the clenching mechanism, said bail forming mechanism being so constructed and connected to said driving mechanism as to form a bail during one substantially complete intermittent movement of said device, and said bail clenching mechanism being so constructed and connected to said driving device as to perform the operation of clenching a bail during one substantially complete intermittent movement of said driving device and independent of the operation of said bail forming mechanism, substantially as specified.

32. In a machine of the character described, a main driving device, means for imparting to said driving device a uniform intermittent movement, bail forming mechanism, a device for discharging the bails therefrom, bail holding and pickup devices, bail driving and clenching devices, said bail forming mechanism and discharging device being so constructed and connected to said driving device as to perform the operation of forming a bail and discharging it to the holding and pickup devices during a substantially complete intermittent movement of the driving devices, and said holding and pickup devices and clenching mechanisms being so constructed and connected to said driving devices as to perform the complete operation of clenching a bail during a substantially complete intermittent movement of said driving devices and entirely independent of the operation of said forming mechanism and discharging device, substantially as specified.

33. In a machine for forming bails, wire feeding mechanism, cutting devices, and forming devices, and a movable discharging device together with means for operating the same to discharge the bails from said forming devices.

In testimony whereof, I have hereunto set my hand this 7th day of May, 1909.

EDWARD E. EUCHENHOFER.

Witnesses:
CHAS. I. WELCH,
OLIVER T. CLARKE.