J. G. PINKSTON.

CRATE FORMING MACHINE.

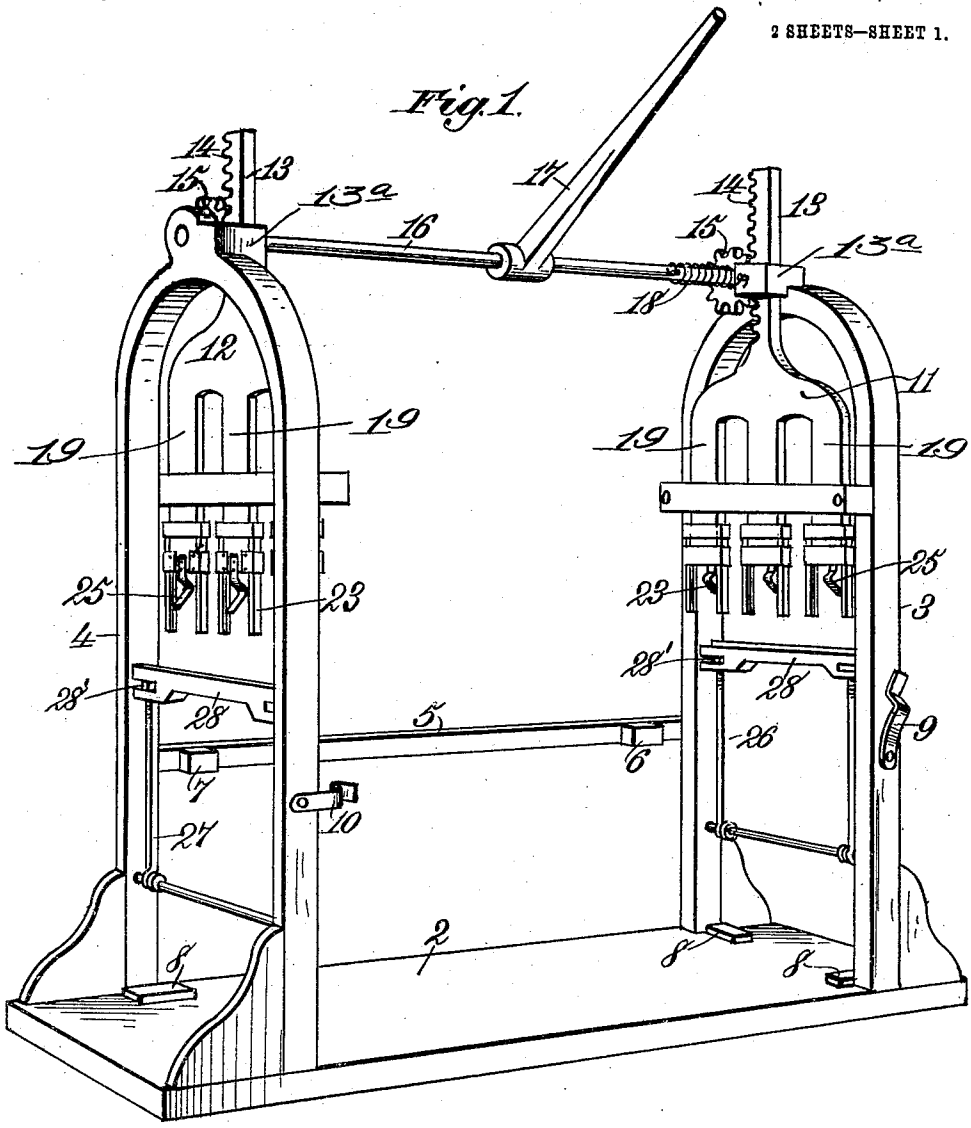
APPLICATION FILED JUNE 3, 1907.

910,310.

Patented Jan. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
Robert Everett.
H. B. Cooper

Inventor:
John Gray Pinkston.
By James L. Norris.
Atty.

THE NORRIS PETERS CO., WASHINGTON, D. C.

J. G. PINKSTON.

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2 SHEETS—SHEET 2.

Fig. 2.

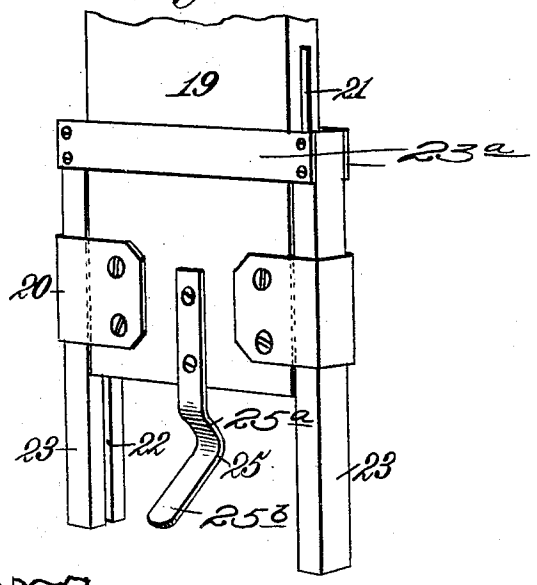


Fig. 3.

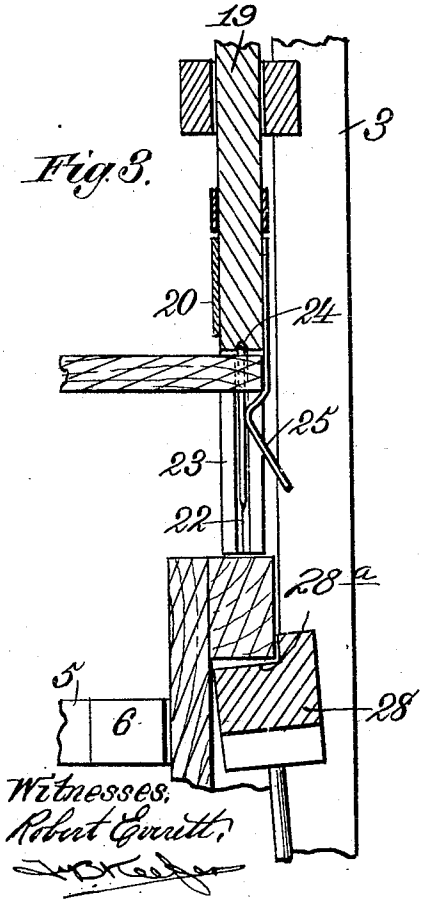
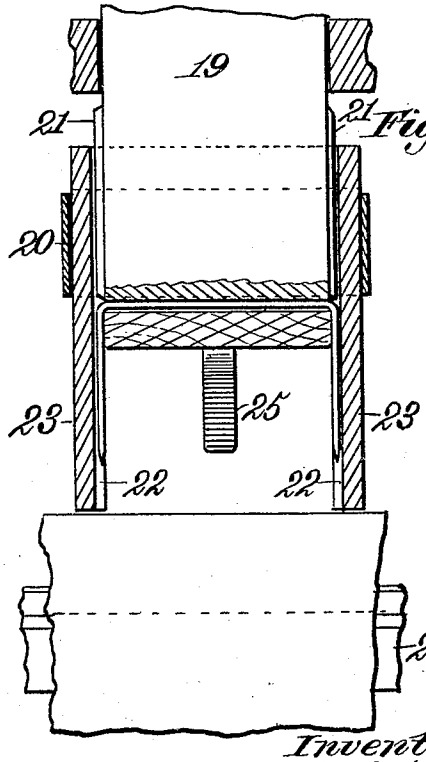


Fig. 4.



Witnesses:
Robt Gwatkin,
W. B. Taylor

Inventor,
John Gray Pinkston,
By James L. Norris, Atty.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN GRAY PINKSTON, OF LUMPKIN, GEORGIA, ASSIGNOR TO LULA L. PINKSTON, OF LUMPKIN, GEORGIA.

CRATE-FORMING MACHINE.

No. 910,310. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed June 3, 1907. Serial No. 377,007.

To all whom it may concern:

Be it known that I, JOHN G. PINKSTON, a citizen of the United States, residing at Lumpkin, in the county of Stewart and State of Georgia, have invented new and useful Improvements in Crate-Forming Machines, of which the following is a specification.

This invention relates to a crate forming apparatus, and the object of the same is to provide a simple and effective organization of parts capable of operation to expeditiously produce crates or analogous box-like inclosures.

The apparatus has been devised more particularly to facilitate the assemblage and attachment of the several parts of the crate or box-like inclosure and to aid in effectively directing and placing the fastening devices.

The invention consists in the construction and arrangement of the several parts which will be more fully hereinafter specified.

In the drawings: Figure 1 is a perspective view of a portion of an apparatus embodying the features of the invention. Fig. 2 is a detail perspective view showing a portion of the driving mechanism and certain coöperative parts. Figs. 3 and 4 are sectional views of the parts shown in Fig. 2, the two sections being at right angles to each other.

Similar characters of reference are employed to indicate corresponding parts in the several views.

The operative parts of the crate forming mechanism are supported upon a framework which preferably comprises a base 2 and similar or substantially similar standards or uprights 3 and 4 rising from and suitably secured to the said base. The base and standards may be of any material, either wood or metal, or a combination of these substances. Two of the standards on one side of the machine or apparatus are connected by a tie bar or strut 5 having on its inner face in proximity to the standards 3 and 4 stops 6 and 7 respectively. The ends of a box are adapted to snugly fit between the respective stops 6 and 7 and standards 3 and 4, the lower portions of the ends engaging stops 8 disposed on the base 2 adjacent to the standards 3 and 4 and preferably consisting of rectangular blocks arranged at angles to each other, as shown by Fig. 1, to effectively serve as a holding means for the lower portions of the ends of a box or crate. The stops 8 partially project inwardly beyond the inner edges or sides of the uprights 3 and 4, and one of each pair of the same adjacent to each pair of uprights 3 and 4 is arranged as to its length in a plane at right angles to the remaining stop of the same pair, this disposition of the stops 8 being reversed at opposite ends or extremities of the base 2. When the ends of the crate or box are in engagement with the several stops, said ends will be positioned to the best advantage for application thereto of the slats which in part go to make up the crate or box.

In addition to the several stops and coöperating therewith to maintain the ends of a box or crate in position during the application of slats thereto, latches 9 and 10 are used and respectively pivoted on the two standards 3 and 4 opposite the similar standards to which the strut or tie bar 5 is applied. The latches 9 and 10 are preferably formed from suitable spring metal and are snapped over the crate or box ends when the latter are placed in engagement with the several stops to prevent the said ends from moving during the application of the slats.

The machine or apparatus has been particularly organized for the use of staples as the fastening means for the slats, and the driving mechanism is so arranged that the staples at one side and opposite ends of a crate or box may be simultaneously driven and similarly clenched. For this purpose the machine or apparatus is equipped with duplicate driving members 11 and 12 which are suitably guided for vertical reciprocative movement respectively by the standards 3 and 4. These driving members 11 and 12 are provided with upwardly extending bars 13 having rack-teeth 14 and movable in guides 13^a held by the standards or uprights 3 and 4, as shown by Fig. 1. These bars 13 constitute rack-bars which are engaged by pinions 15 secured to a shaft 16 supported in any desirable manner for rotative movement in suitable bearings on the standards or uprights. The shaft 16 between its ends has a handle lever or other actuating member 17 and by which the said shaft may be turned to impart through the rack-bars 13 and pinions 15 a simultaneous downward or working stroke to the driving members 11 and 12. It is proposed to have the driving members 11 and 12 return to normally ele-

vated position in an automatic manner when the hand lever or actuating member 17 is released, and the simplest means for arriving at this result is to encircle the shaft 16 near one end with a spring 18 connected at one extremity to said shaft and also secured at its opposite extremity to an adjacent portion of the frame-work. When the hand-lever or actuating member 17 is operated to lower the two driving members 11 and 12 the spring 18 is tensioned or contracted, and when the hand lever is released the relaxation of the spring will return both driving members to their initial or normal upper positions.

The driving members 11 and 12 are of duplicate construction and a detail description of one will suffice for the other. The driving member 11, for instance, is shown as having three branches or driving sections 19, but this number may be increased and in some organizations of the machine might be decreased, it being obvious that in providing a number of driving sections a corresponding number of fasteners may be applied therewith. Each branch or driving section 19 is practically surrounded by a sleeve 20, and at the opposite side edges of the branch or driving section are tongues 21 to fit grooves 22 formed in the inner opposing sides of holding legs 23 slidable through the opposite projecting portions of the sleeve 20, the latter providing guides for the holding legs 23 and maintained in parallelism by connecting strips 23^a terminally secured to the upper extremities of the said holding legs and projecting across the opposite sides of the driving branch or section 19. The grooves 22 of the holding legs 23 are adapted to receive the legs of a staple, these grooves being clear or readily accessible when the driving members 11 and 12 are in normal elevated positions, as clearly shown by Fig. 1. The heads of the staples fitted in the grooves of the several branches or driving sections 19 engage grooves 24 in the lower edges of said sections, as shown by Fig. 3, the tongues 21 serving to institute a pressure at such points with relation to the bends between the legs and head of each staple as to insure a regular penetration of the staple legs into the crate or box members, or into the crate or box ends and obstruct irregular bending or distortion of the staple head adjacent to the opposite bends thereof and which merge into the legs.

Attached to the outer side and to the central portion of each driving section 19 is a retaining tongue 25, the said tongues in the respective driving sections at opposite extremities of the machine or apparatus being arranged in alined pairs. These tongues 25 serve as detents for supporting the slats during the descent of the driving organizations or devices explained, and each tongue is inwardly deflected as at 25^a to form a seat between the same and the adjacent lower edge of the driving section 19, and from the lower portion of the said inward deflection the tongue is continued outwardly and downwardly to provide a clearing projection 25^b which is adapted to engage the end of the crate or box when the driving members 11 and 12 have practically reached the lower limit of their downward movement to force the said detent outwardly at each extremity of the machine and liberate the slat that may have been carried thereby during the descent of the driving members. The detents 25 depend below the lower edges of the driving sections 19 and are preferably located in central relation between the legs 23.

Means are also provided as a part of the machine or apparatus for positively clenching the staples driven through the crate or box ends, and consist of swinging arms or carriers 26 and 27 held between the standards 3 and 4 below the driving members 11 and 12 and free to be swung up into operative position or moved out of the way after a side has been applied to the ends of a crate or box. Each clenching member has a head 28 preferably formed of metal adjustably mounted on the upper or free ends of the arms or carriers 26 and 27, the said free ends of the arms or carriers being threaded and engaged by adjusting nuts 28^7 located in slots or apertures in the said clenching heads. This adjustable feature of the clenching means is advantageous in that the heads 28 may be shifted or moved on the arms or carriers 26 and 27 to compensate for variations in the length of the staple legs or to vary the portions of the upset extremities of the staple legs. The contacting edge of each head 28 is formed with an angular seat 28^a to receive the cross strip of the crate or box end as shown by Fig. 3, the clenching heads 28 being normally disposed at a slight inward inclination to render them more effective in clenching the staple extremities and also to insure an inward drawing tendency of the said heads when pressure from above is imposed thereon and during the stapling operation and obviate any tendency of the said heads to slip away or shift outwardly from beneath the strips or parts of the ends of the crates or boxes with which they engage.

Initially two crate or box ends will be placed in position in the apparatus or machine and in engagement with the stops 6, 7 and 8 and the latches 9 and 10. The driving members will then be loaded with staples which are fitted in the grooves 22 of the legs 23. The slats will then be placed in engagement with the tongues or detents 25, the slat ends being held by the said tongues or detents, as shown by Fig. 3, within the staple legs and below and close to the staple

heads, as shown by Fig. 4. The driving members are then lowered, as hereinbefore explained, until the lower ends of the legs 23 come in contact with the crate or box ends to confine the staple legs in proper relation to the portions of the crate or box ends into which they are to be driven. The sections 19 continue to move downwardly and force the staple legs through the upper strips of the box ends, it being understood that the clenching heads 28 will have first been arranged under the said strips as shown by Fig. 3. The extremities of the staple legs projected through the upper strips of the crate or box ends will be upset against the under edges of the said strips by coming in contact with the clenching heads 28, the latter serving as upsetting anvils. The outwardly deflected downwardly inclined clearing projections 25^b of the tongues or detents 25 will, as readily understood, descend regularly with the sections 19 and will strike the outer corners of the upper strips of the crate or box ends and gradually expand in outward direction owing to their inclination and liberate or release the slats after the latter have been accurately positioned on the crate or box ends, the said tongues under these conditions sliding downwardly over the outer sides of the upper strips of the crate or box ends. When the slats are applied to the upper edges or tops of the crate or box ends, their opposite ends will be positioned inwardly a short distance from the outer sides of the upper strips of the crate or box ends so that the joints between the slat ends and the said upper strips will be inaccessible for engagement by the tongues or detents 25 when the latter return to normal elevated position, the said tongues or detents slipping over the slat ends without any tendency to loosen the latter or without creating undue friction on the tongues or detents that might interfere with the automatic return action of the spring 18. After thus securing one set of slats, the crate or box ends may have other slats similarly applied thereto and by releasing the latches 9 and 10 and disengaging the clenching heads or anvils 28, the crate or box may be removed and readjusted or when completed replaced by crate or box ends for similarly applying slats thereto.

It is proposed to construct the ends or heads of the box or crate in any suitable manner and by means of any preferred mechanism prior to the disposition of said ends or heads in the apparatus to receive the slats.

Having thus described the invention, what is claimed as new, is:

1. In an apparatus of the class described, a pair of driving members involving holding legs and sections movable between the said legs, the sections of the driving members being disposed opposite to each other, yieldable slat holding means depending below the lower edge of each driving section and having slat holding seats and outwardly and downwardly inclined clearing projections, the legs of the driving members being provided with means for holding fastening devices, and the slat extremities being retained between the holding legs by the said slat holding means, mechanism for simultaneously operating said driving members, and means for supporting the end portions of a crate or box to which the slats are to be fastened, the clearing projections of the slat holding means engaging portions of the end portions of the crate or box in their descent to release the slats.

2. In an apparatus of the class described, the combination of a base, standards rising from the base, stops on the base adjacent to the standards, a strut engaging the standards on one side of the apparatus and provided with stops against which the ends of the crate are adapted to abut, swinging anvil means held by and between the standards and also serving to engage a portion of the crate or box and hold the latter in place, the anvil means being disposable at an inward angle with relation to the standards to effectively hold the part of the crate engaged thereby, and driving means for fastening devices movably held by and operatively associated with the standards above the anvil means and provided with slat holding devices operating to dispose and hold the slats in place on the crate while applying the fastening devices therefor and to automatically release the slats.

3. In an apparatus of the class described, a frame means having standards at opposite extremities arranged in pairs, means for holding crate or box ends in upright positions close to the pairs of standards, vertically reciprocative driving members held between the standards and comprising holding legs to receive fastening devices therebetween and driving sections movable between the legs, the legs and driving sections being unitedly movable for a certain distance and the driving sections subsequently movable between the said legs, clenching members held between the standards below the driving members and arranged to engage the upper portions of the crate or box ends, and yieldable slat holders secured to and depending below the lower extremities of the driving sections and having portions to engage parts of the crate or box ends to force the said holders outwardly and release the slats carried thereby.

4. In an apparatus of the class described, a pair of driving members each provided with holding legs and a driving section movable between the legs, the legs and section being unitedly movable during a part of

their operation and the driving section subsequently movable between the legs while the latter are in a position of rest, the said legs being adapted to receive staples, yieldable slat holding means carried by and depending below the lower end of each driving section and provided with outwardly inclined portions to contact with parts of the ends of a crate or box for releasing a slat held thereby, and means for simultaneously operating the said driving members.

5. In an apparatus of the class described, a pair of driving members each provided with holding legs and a driving section movable between the legs, the legs and section being unitedly movable during a part of their operation and the driving section subsequently movable between the legs while the latter are in a position of rest, the said legs being adapted to receive staples, yieldable slat holding means carried by and depending below the lower end of each driving section and provided with outwardly inclined portions to contact with parts of the ends of a crate or box for releasing a slat held thereby, clenching members movably disposed below the driving members to engage portions of the crate or box ends, and means for supporting the said clenching members and for simultaneously operating the said driving members.

6. In an apparatus of the class described, means for supporting crate or box ends, a pair of driving members each having a driving section, the driving members adapted to receive fastening devices, the driving members and their sections being unitedly movable during a portion of their operation and the driving sections being movable within the driving members during the remaining portion of their operation, a yieldable slat holder directly secured to and depending from each driving section and movable with the latter after the driving members have stopped movement, each slat holder being provided with an outwardly projecting inclined portion to engage the crate or box end and automatically release the slat carried thereby just prior to the complete attachment of the slat to the crate end, and mechanism for operating said driving members.

7. In an apparatus of the class described, means for holding crate or box ends in upright position, swinging anvils movable under portions of the crate or box ends, a pair of driving members disposed above the anvils and individually arranged to cooperate with a crate or box end and comprising holding legs for receiving fastening staples and driving sections movable between the legs and having their lower ends disposed to engage the heads of the staples, a yieldable slat holding device secured to the intermediate portion of and depending below each driving section to engage opposite extremities of a slat and hold the same beneath the staple heads, the slat holding devices being operative to release the slat by contact with portions of the crate or box ends.

8. In an apparatus of the class described, means for holding crate or box ends, mechanism for holding staple fastenings and permitting the legs of the fastenings to depend therefrom, and means for holding slats depending from and movable with the said mechanism, the slats being held by said means within the staple fastenings with the heads of the latter over the top portions of the slats, the mechanism for holding the fastenings being provided with operating devices for moving the fastenings simultaneously downwardly towards and into the crate or box ends over the slats.

9. In an apparatus of the class described, means for holding crate or box ends, mechanism for holding staple fastenings provided with means to carry a slat within the legs of the fastenings and so that the heads of the latter will be over the upper portions of the slats, means for simultaneously moving the fastenings downwardly towards and into the box ends and applying the slats to said ends, and clenching anvils movably arranged below the said fastening holding mechanism to engage portions of the crate or box ends.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN GRAY PINKSTON.

Witnesses:
JOHN T. HARRISON,
A. T. FORTE.