May 24, 1932. T. M. DIVER 1,859,383

BOOKING MECHANISM FOR RADIATOR CORE MAKING MACHINES

Original Filed Aug. 4, 1928 4 Sheets-Sheet 1

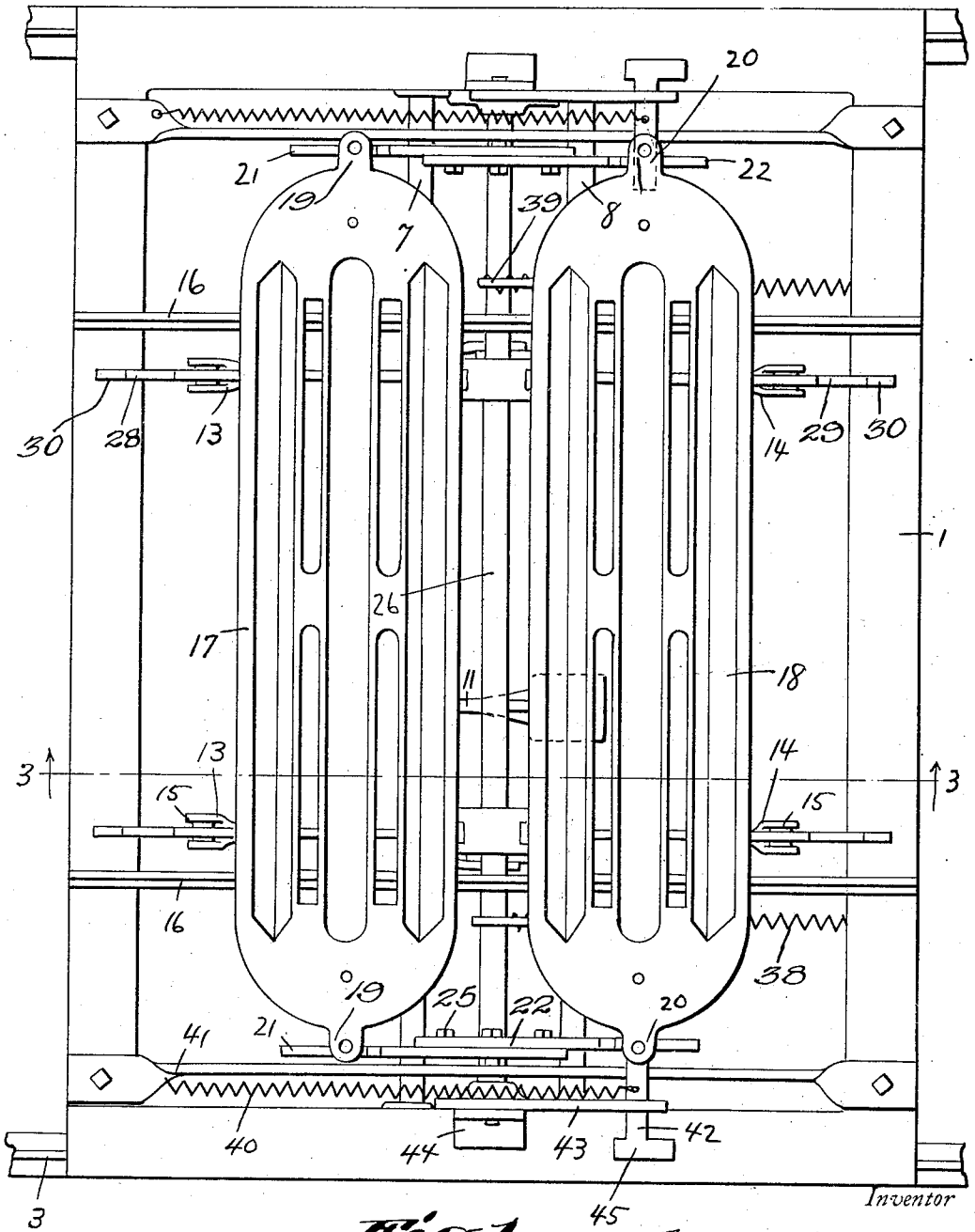


Fig. 1.

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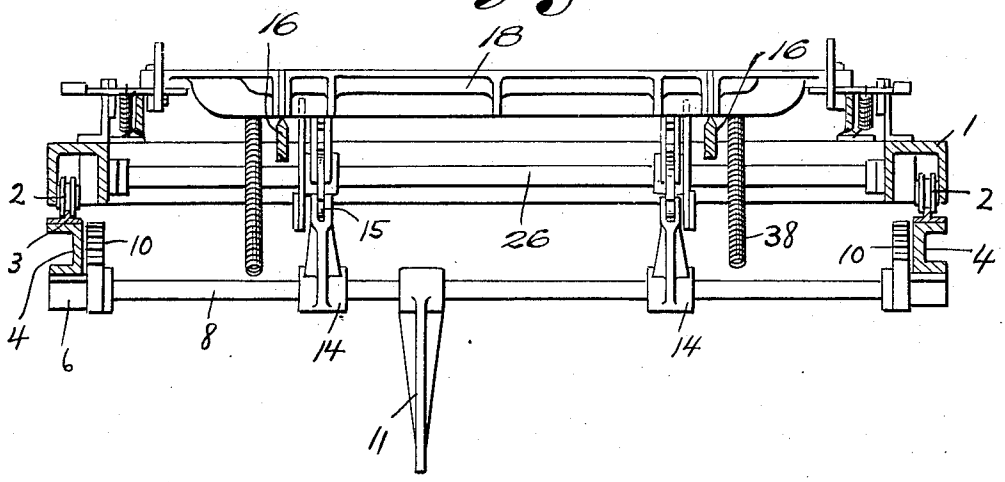
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BOOKING MECHANISM FOR RADIATOR CORE MAKING MACHINES

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Fig. 2.



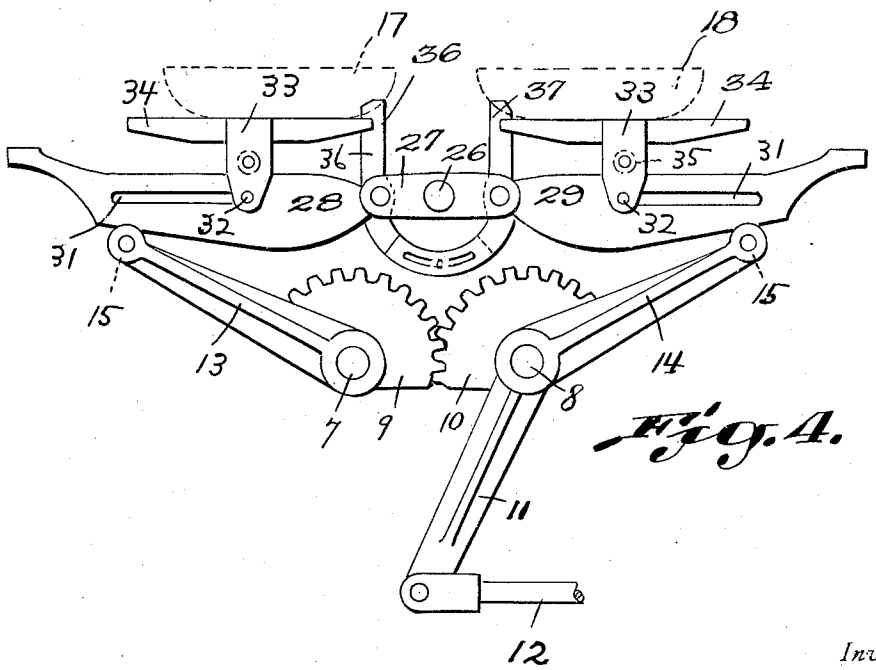


Fig. 4.

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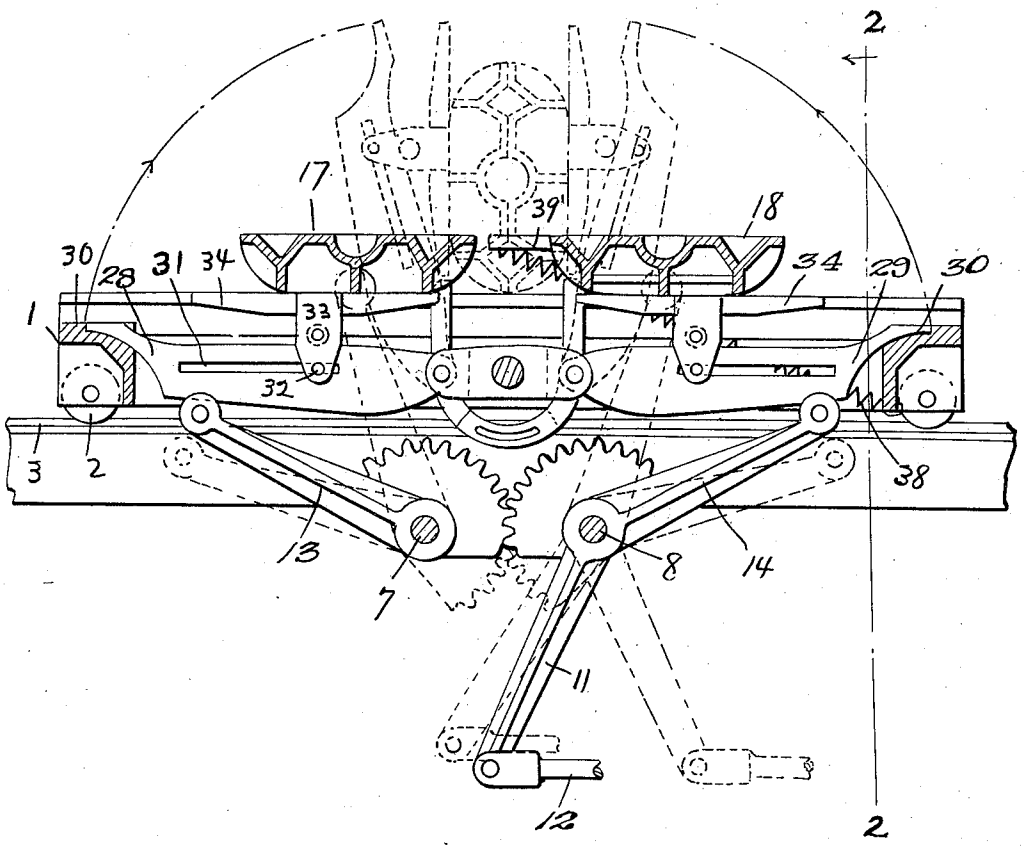
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BOOKING MECHANISM FOR RADIATOR CORE MAKING MACHINES

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Fig. 3.



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BOOKING MECHANISM FOR RADIATOR CORE MAKING MACHINES

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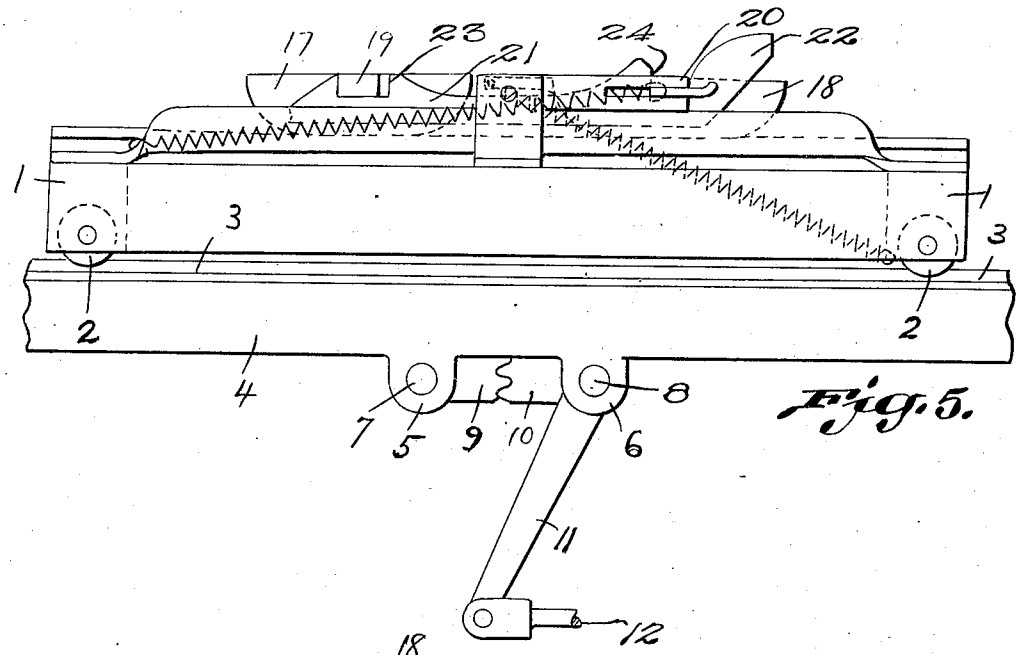


Fig. 5.

Fig. 6.

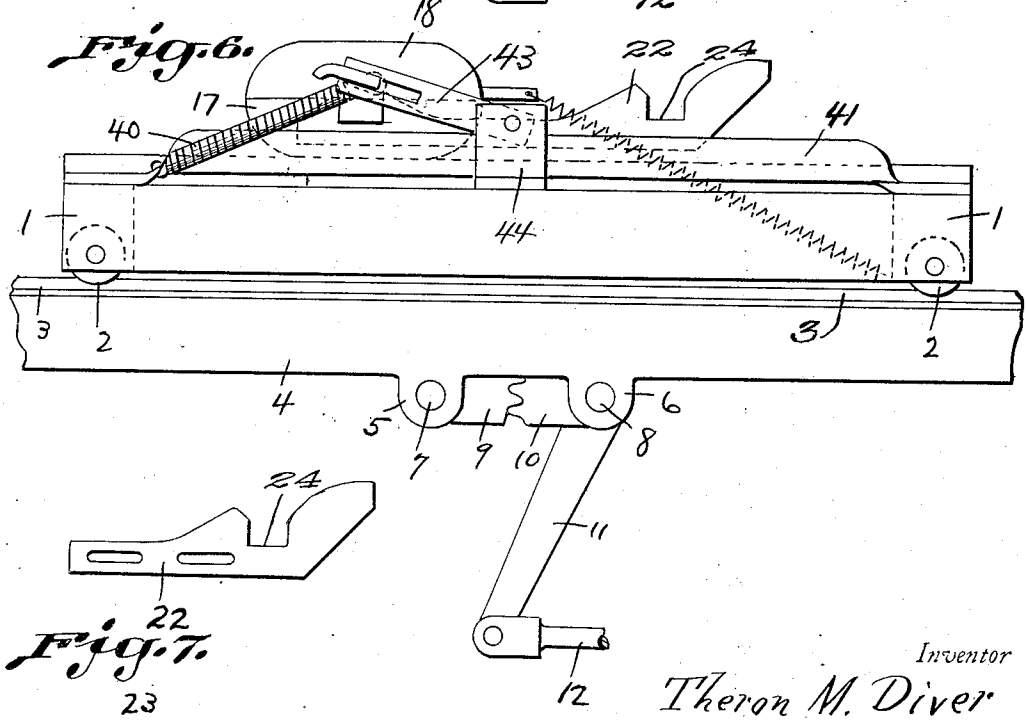


Fig. 7.

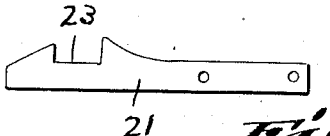


Fig. 8.

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UNITED STATES PATENT OFFICE

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BOOKING MECHANISM FOR RADIATOR CORE MAKING MACHINES

Application filed August 4, 1928, Serial No. 297,532. Renewed October 23, 1931.

This invention relates to improvements in core making machines for heating radiators and has reference more particularly to a booking mechanism therefor.

One of the important objects of the present invention is to provide a booking mechanism that includes a core pan and a core box, the same being normally separated and disposed in a horizontal position, means being provided for swinging the core pan and core box upwardly and toward each other for contact with each other when in a vertical position, additional means being provided whereby these parts can be moved to a horizontal position with the core box arranged on top of the core pan, and when in this last mentioned position by lifting upwardly on the core box, the core pan, with the core in it can be removed without any danger of disturbing the core. The core can then be baked in the exact condition and position it was in when booked.

A further object is to provide a booking mechanism for a radiator core making machine that will save considerable time and labor and will furthermore be reliable and efficient in its operation.

Still a further object is to provide a booking mechanism for a radiator core making machine which is simple in construction, inexpensive, strong and durable, and further well adapted to the purpose for which it is designed.

Other objects of the invention will become apparent as the nature of the invention proceeds and when taken in connection with the accompanying drawings.

In the accompanying drawings, forming a part of this application, and wherein like reference characters designate like parts throughout the several views;

Figure 1 is a top plan view of the booking mechanism embodying my invention showing the core pan and the core box in an open horizontal position.

Figure 2 is a vertical sectional view, taken approximately on the line 2—2 of Figure 3, looking in the direction of the arrow.

Figure 3 is a transverse section taken on the line 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4 is an end elevation showing diagrammatically the arrangement of the parts that actuate the core pan and the core box.

Figure 5 is an end elevation of the booking mechanism showing the parts in their normal position, the core pan and the core box being arranged horizontally in an open manner.

Figure 6 is a view similar to Figure 5, showing the core box superimposed upon the core pan and the same being disposed horizontally prior to the removal of the core pan and the core therein, and

Figures 7 and 8 are details of the hook shaped brackets that cooperate with the lugs that extend outwardly from the ends of the core pan and core box.

In the drawings, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates a substantially rectangular shaped frame, that is preferably constructed of channel iron material. Grooved rollers 2 are journaled for rotation at the corners of the frame, and travel on the spaced track 3 that are disposed longitudinally beneath the end portions of the rectangular frame 1, as clearly illustrated in the drawings. These tracks are mounted upon a suitable supporting side beam 4, which may also be of channel iron. A pair of spaced apertured lugs 5 and 6 respectively depend from the bottom of the intermediate portion of each beam 4. A shaft 7 extends transversely beneath the side beams and the ends of this shaft are journaled in the aligned apertured lugs 5.

A similar shaft 8 has its ends journaled in the other pair of aligned apertured lugs 6. These shafts are operatively connected together for simultaneous movement through the medium of the intermeshing segmental gears 9 and 10 respectively and furthermore, these intermeshing segmental gears will effect the turning movement of the shafts 7 and 8 in opposite directions.

A primary operating lever 11 is fixedly secured at its upper end to the intermediate portion of the transverse shaft 8, while the

lower end of this lever is adapted to be connected to a power transmission rod 12 as suggested in Figures 3, 4, 5, and 6 of the drawings.

Also secured on the shafts 7 and 8, for movement therewith are the secondary operating levers 13 and 14 respectively, two pairs of such secondary operating levers being provided as clearly indicated in the drawings, and each pair is arranged inwardly of the respective ends of the frame 1. The secondary operating levers are slightly inclined upwardly and a roller 15 is carried by the outer end of each of these secondary operating levers for a purpose to be presently described.

Cross bars 16 extend transversely across the top of the frame 1, inwardly of the respective ends thereof to provide a support upon which the core pan 17 and the core box 18 are adapted to rest when in a normally open horizontal position, as suggested in Figure 1. Lugs 19 extend outwardly from the respective ends of the core pan 17 and similar lugs 20 extend from the outer ends of the core box 18. The core pan and core box are constructed principally for use in the formation of a heat radiator core. The core pan is not connected to the core box, but the manner in which these elements cooperate with each other will be presently described in detail.

Adjustably connected hook shaped brackets 21 and 22 are arranged at the respective end portions of the frame and the outer ends of these brackets are formed with the lug receiving notches 23 and 24 respectively. The laterally projecting lugs 19 associated with the core pan 17 normally rests within the notches 23 of the respective brackets 21, while the lugs 20 that extend laterally from the core box 18 are adapted for disposition within the notches 24 of the complementary brackets 22, and this is clearly indicated in Figures 1 and 5 of the drawings. The securing means for the overlapping inner ends of the complementary bracket shown is at 25, while in Figures 7 and 8 there is disclosed in detail the specific construction of each of these brackets.

A rod 26 extends longitudinally of the frame 1 and is secured at its ends to the intermediate portions of the forward and rear ends of the frames 1. A pair of stationary brackets 27 have their intermediate portions secured on the rod 26, and these brackets are disposed in a substantially horizontal plane as clearly indicated in Figures 3 and 4 of the drawings.

Cam arms 28 and 29 are pivotally connected at their inner opposed ends to the respective ends of each stationary bracket 27.

Each of these cam arms is in the form of a relatively thin bar or strip, the lower end of which constitutes a cam face for cooperation with the roller 15 of the respective secondary operating lever as clearly suggested in Figures 3 and 4 of the drawings. The outer free ends of these cam arms are adapted to rest within suitable cut-out portions 30 provided therefor in the respective sides of the rectangular frame 1, as clearly shown in Figure 3. Furthermore, each cam arm is formed with a longitudinally extending slot 31, in which is operable a pin 32, that extends laterally from the lower end of a leg 33, that is secured at its upper end to a horizontally disposed shoe 34. A roller 35 is carried by each vertical leg member for engagement with the upper edge of the respective cam arms and there are as many leg members and shoes as there are cam arms.

The shoes 34 are furthermore adapted to engage with the bottoms of the core pan and core boxes 17 and 18 respectively, when the latter are disposed in their normal horizontal open positions, and this is also shown very clearly in Figures 3 and 4 of the drawings. The shoes 34 will furthermore engage with the core pan and core box when the latter are disposed in a vertical position as shown by the dotted lines in Figure 3.

Associated with each bracket 27 are the upwardly disposed adjustably connected trip dogs 36, and 37 respectively. The upper ends of the dogs are disposed adjacent the inner opposed edges or ends of the respective pair of shoes.

The trip dogs 36 and 37 keep the core pan and core box a correct distance apart, as they rise to the vertical position until the edges of the pan and box meet and assume a vertical position. The dog 36 further tends to stabilize the box and pan when they are lowered to a horizontal position.

A pair of coil springs 38 are connected at their outer ends to the adjacent side of the frame 1, the inner ends of these springs being connected to pins 39 that extend from the inner side edge of the core box 18. Additional coil springs 40 are connected, at their outer ends to suitable brace bars 41 that extend across the frame, adjacent the forward and rear ends thereof. The inner ends of the springs 40 are connected to a finger 42 that extends from each end of the core box 18 and is disposed through a slotted member 43 that is pivoted at its lower end on an upstanding bracket 44 secured on the forward and rear ends of the frame. An extension 45 is formed on the outer end of each finger 42, as suggested in Figure 1.

The operation of my improved booking mechanism may be briefly stated as follows:

Normally the parts are arranged as shown in Figures 1 and 5, wherein the pan and box are disposed horizontally in an open position for rest upon the cross bar 16. By operating the power operating rod 12, and to pull the same to the right, the primary oper-

ating lever 11 will actuate the shaft 8 and as the shaft 8 is geared to the shaft 7 through the segmental gears 9 and 10, said shafts 7 and 8 will rotate in unison toward each other. This action results in the secondary operating levers 13 and 14 being raised, and as the rollers 15 engage with the cam faces of the respective cam arms 28 and 29, the latter will swing upwardly by reason of their pivotal connection with the stationary brackets 27.

This upward movement of the cam arms results in the tilting of the shoes 34 so that the core pan and core box will be swung upwardly toward each other and the same will come in contact when in a vertical position and form the core from the sand that has, before the movement just begun, and by another mechanical arrangement (not shown) placed in the pan and box.

The position of the parts when the core pan and core box are in a vertical position is clearly shown in the dotted lines in Figure 3. After the core has been formed, the core box and pan are still in contact with each other and through the medium of the trip dogs 36 and 37, the core box and pan will be caused to swing downwardly in a left hand direction to the position shown in Figure 6, whereupon the pan 17 will again rest on the cross bars 16, while the box 18 will be disposed on top of the pan. This movement of the pan and box from a vertical to a horizontal position is further assisted through the medium of the springs 40. The tension of the springs are released after the power on the transmission rod 12 is released, but during the actuation of the mechanism to dispose the core pan and core box in a vertical position, the springs 40 are placed under tension.

Subsequently the core box 18 is lifted off of the core pan, sufficiently to permit the pan and the core in the same to be removed and to permit the insertion of another pan. As soon as the core pan containing the core ready for the oven is removed, and a new core pan substituted in lieu thereof, the parts of the booking mechanism are returned to their normal positions as shown in Figures 1 and 5.

The core can be backed in the exact condition and position it was in when booked.

The provision of a booking mechanism for a heat radiator core making machine will enable a perfect core to be formed. Furthermore, the improved booking mechanism as described above will at all times be positive and efficient in its operation, and due to its simplicity, access to the several parts can be readily and easily had.

A booking mechanism of the above mentioned character can be constructed at a very low cost, and will furthermore be strong and durable.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A booking mechanism for radiator core making machines comprising in combination a supporting frame, cross bars arranged on the frame, a core box, a core pan separate from the core box, said core box and core pan normally resting on the cross bars in an open horizontal position, means for swinging the core box and the core pan upwardly toward each other to a vertical closed position, whereby the inner opposed edges of the box and pan will rest on the cross bars, and additional means for swinging the box and pan while still in a closed position downwardly to a horizontal position for rest upon the cross bars with the pan underlying the cross bar.

2. A booking mechanism for a radiator core making machine comprising in combination, a frame, cross bars arranged on the frame, a core box, and a core pan independent of the box, said box and pan being adapted to normally rest in a horizontally open position on said cross bars, a pair of lifting arms pivoted at their inner opposed ends for disposition beneath the core box and pan respectively, a shoe carried by each arm for engagement with the other side of the box and pan respectively, means for actuating said arms simultaneously to swing the box and pan upwardly toward each other to a vertical closed position and additional means for swinging the box and pan while still in a closed position downwardly to a horizontal position for rest upon the cross bars with the pan underlying the box.

3. A booking mechanism for radiator core making machine comprising in combination, a frame, cross bars arranged on the frame, a core box, and a core pan independent of the box, said box and pan being adapted to normally rest in a horizontally open position on said cross bars, a pair of lifting arms pivoted at their inner opposed ends for disposition beneath the core box and pan respectively, a shoe carried by each arm for engagement with the other side of the box and pan respectively, means for actuating said arms simultaneously to swing the box and pan upwardly toward each other to a vertical closed position, and additional means for swinging the box and pan while still in a closed position downwardly to a horizontal position for rest upon the cross bars with the pan underlying the box, said first mentioned means comprising a pair of shafts supported below the arms, means for actuating the shaft to turn the same in opposite directions, and levers secured to the shaft for movement therewith, said levers being operatively engaged with the respective arms.

4. A booking mechanism for a radiator core making machine comprising in combination, a frame, cross bars arranged on the frame, a core box, a separate core pan, said box and pan normally supported in a horizontal open position upon the cross bars, a stationary bracket supported below the inner opposed edge portions of the box and pan, cam arms pivotally connected at their inner ends to the respective ends of the stationary bracket and extending horizontally, a shoe carried by each cam arm for engagement with the under side of the core box and core pan respectively, a pair of oppositely rotating shafts arranged below the stationary brackets, actuating means for the shaft, said shafts rotating in unison, lifting levers secured at their inner ends on the respective shafts, said levers being inclined upwardly, the upper ends of the levers engaging with the bottom cam face of the respective arms to swing the core box and pan upwardly toward each other to a vertical closed position, and additional means for moving the box and pan while still in a closed position to a horizontal position for rest upon the cross bars with the core pans underlying the core box.

5. A booking mechanism for core making machines comprising a stationary bracket, cam arms pivotally connected at their inner ends to the respective ends of the bracket, each arm having a longitudinal slot and a lower cam edge, a longitudinally disposed horizontal shoe above each cam arm, each of said shoes furnishing a support for a half core box disposed horizontally thereon, a connecting leg extending from each shoe and engaged in the slots of the cam arm for movement longitudinally of the latter, a roller carried by each leg and in contact with the upper edge of the cam arm to prevent relative pivotal movement of the connected members, and means for moving the said cams upwardly and inwardly about their respective pivots to effect similar movement of the core box supporting shoe, thereby bringing together the halves of the core box, and a U-shaped trip member fixed between the said shoes with its respective arms disposed adjacent the inner ends of the shoes to provide fulcrums upon which the said half core boxes rest and upon which they move when raised to the vertical position.

6. A booking mechanism for core making machines comprising oppositely disposed sets of core box supporting members, each set being adapted to support a horizontally disposed half core box and the two sets being pivotally connected for movement upwardly into a vertical position for bringing the half core boxes together, the said sets respectively including lifting units, each of which comprising a pivoted member and a slidable member carried by the pivotal member and having movement longitudinally of the pivoted member, fulcrum providing means between the inner end of opposed slidable members for engaging and assisting the half core boxes to assume a vertical position, means for moving the said main pivoted members for bringing the half core boxes together, and means for causing the associated core box sections to move laterally and downwardly to a horizontal position.

7. A booking mechanism for core making machines comprising a frame, a core box and core pan movable with respect to the frame, said pan and box normally supported in horizontal position in open relation, means for moving the box and pan to a vertical position whereby the box and pan are in closed relation, and spring tension means connected to the frame and with the core box for swinging the pan and box in closed relation from vertical to a horizontal position when power is released from said first mentioned means.

8. A booking mechanism for core making machines including in combination a frame, a support for a core box and core pan pivotally connected with the frame, and means connected with the support for shifting the axis of the support.

9. A booking mechanism for core making machines including in combination, supporting shoes for a core pan and a core box normally disposed in horizontal position in open relation, means associated with the shoes for swinging the shoes toward each other, and the shoes being shiftable during the swinging operation.

10. A booking mechanism for core making machine comprising a frame, cam arms pivotally connected with the frame, supporting shoes adapted for carrying a core box and a core pan rockably connected with the cam arms and having the rockable axis thereof shiftable.

11. A booking mechanism for core making machines comprising a movable frame, a supporting track for carrying the frame, cam arms pivotally connected with the frame, supporting shoes adapted for carrying a core box and a core pan rockably connected to the cam arms having the rockable axis thereof shiftable with respect to the cam arms, and means carried by the track for moving the cam arms.

In testimony whereof I affix my signature.

THERON MILTON DIVER.