

Dec. 25, 1945.

E. C. KLOSS

2,391,715

CORE BOX

Filed Oct. 24, 1942

3 Sheets-Sheet 1

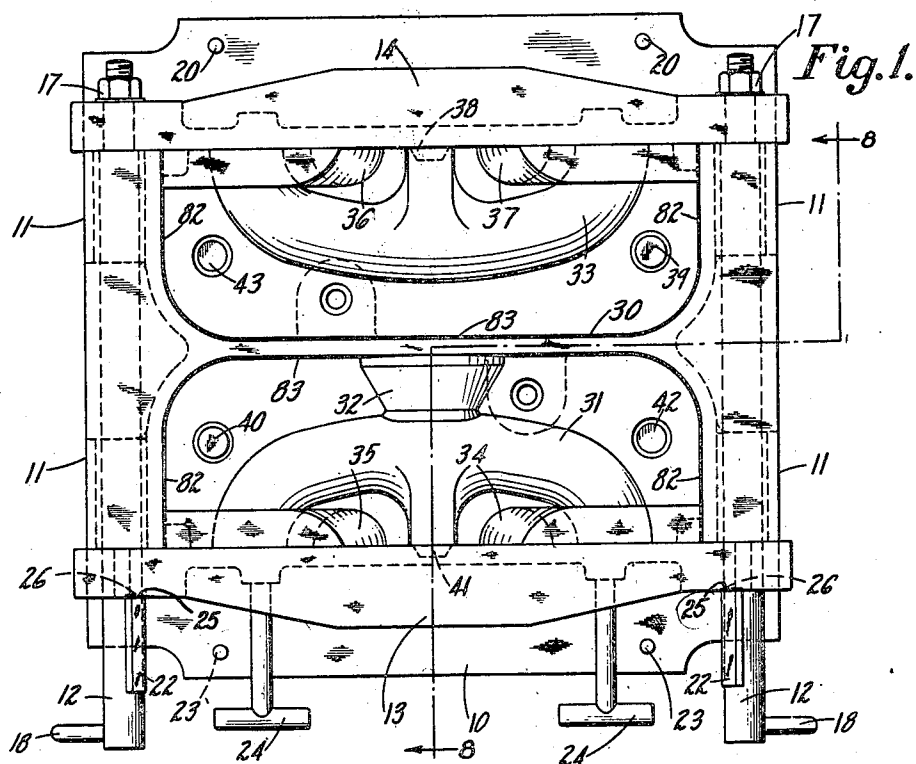
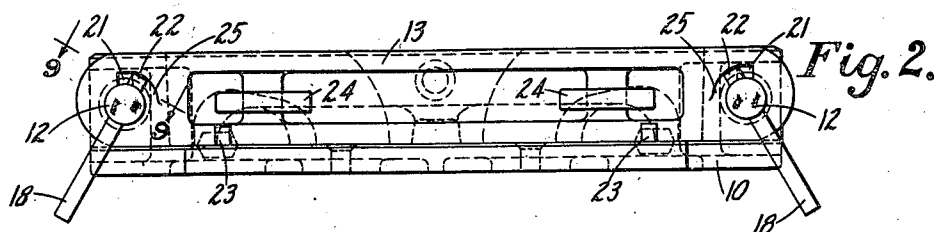
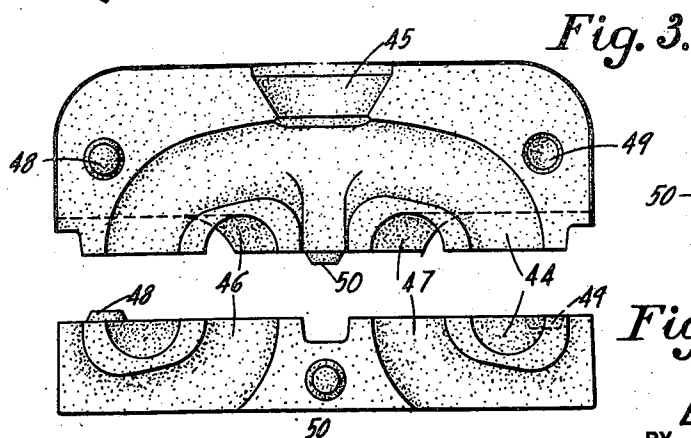
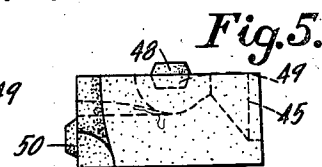


Fig. 4.

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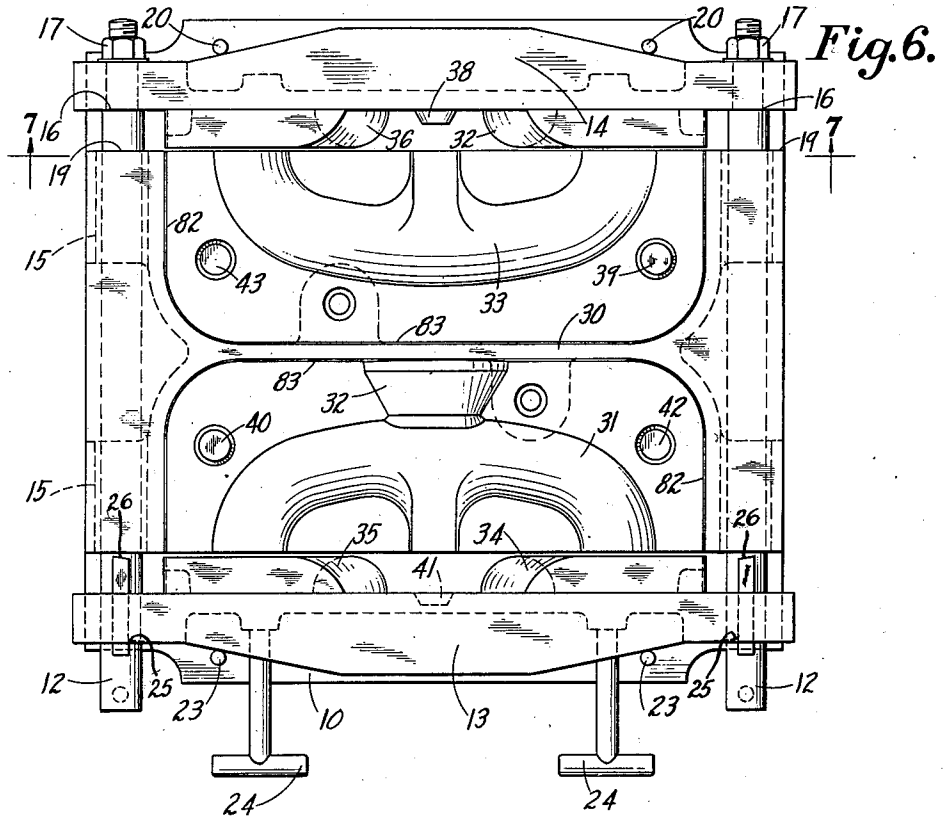


Fig. 7.

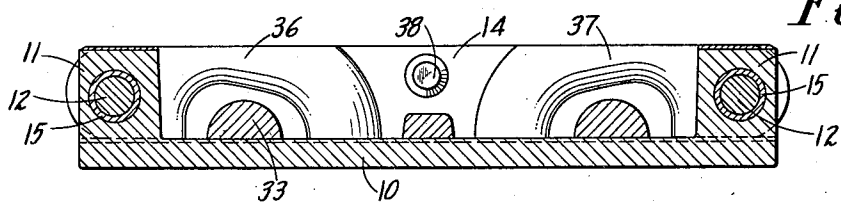


Fig. 8.

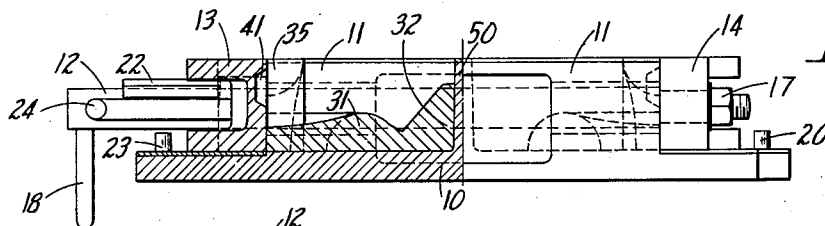
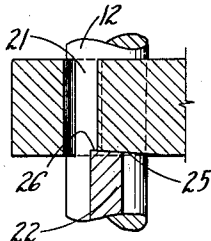


Fig. 9.



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Fig. 10.

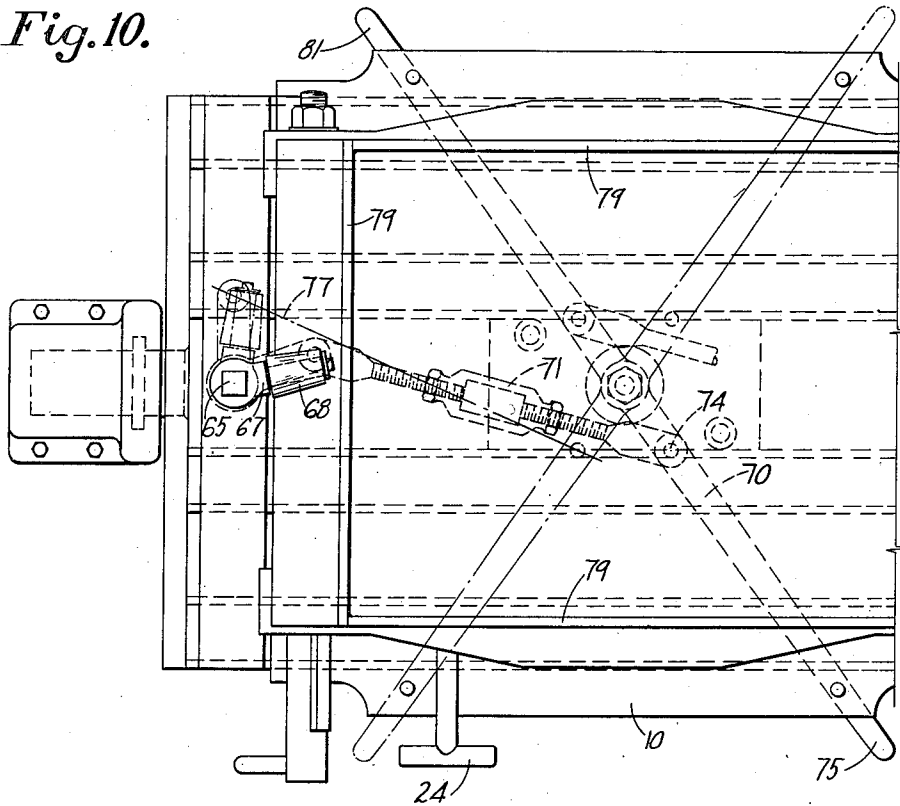
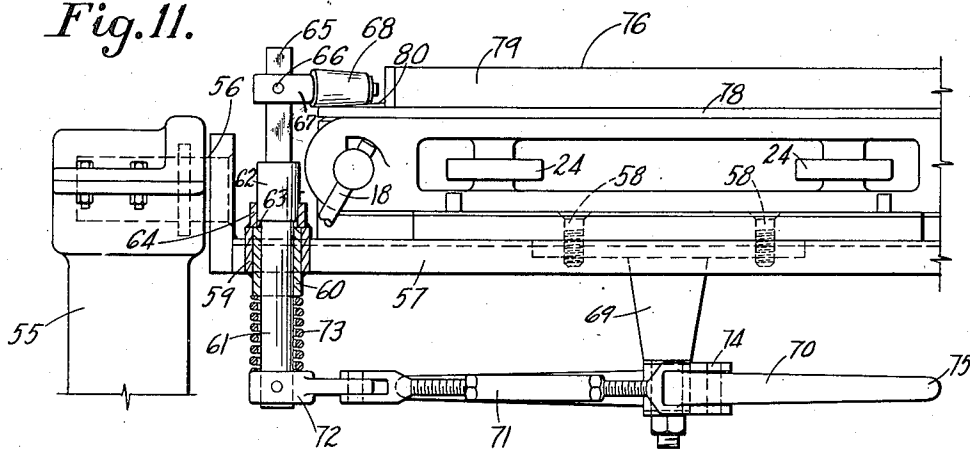


Fig. 11.



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UNITED STATES PATENT OFFICE

2,391,715

CORE BOX

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Application October 24, 1942, Serial No. 463,206

5 Claims. (Cl. 22—137)

This invention relates to an improved core box for making cores used in the manufacture of cast anchor chain, mooring chain and the like.

In the manufacture of cast chain the molds for the links are made of a plurality of baked sand cores. The cores are made in sections so that precast links can be assembled in certain cavities in the cores. The connecting links, which join the precast links, are formed by pouring metal in the mold cavities provided therefor in the assembled core sections. The method of assembling the various links and cores is described in my copending application Serial No. 451,882, filed July 22, 1942, now Patent No. 2,348,979, issued May 16, 1944. The present invention deals with improved apparatus for making the cores used with the method described and claimed in the aforesaid application.

In making the cores the core box is mounted on a molding machine having provisions for inverting the core box and withdrawing the cores on a plate with which they are transferred to a baking oven. Inasmuch as impressions for several links are formed in each core, one of the impressions being at right angles to the others, parts of the core box must move relative to the remainder thereof so as to permit the core to be withdrawn. A feature of my invention therefore relates to the means for clamping and releasing the movable parts of the core box so that the mold may clamp and release the movable parts simply and expeditiously during the molding operation.

A further feature of the invention relates to the means for clamping the cover plate on the core box so that it may be readily released and lowered with the core when the core box is inverted before removing the core therefrom.

Other features and advantages of the invention will be understood from the following description taken in conjunction with the drawings, in which:

Figure 1 is a plan view of the core box.

Figure 2 is a view of the core box in front elevation.

Figure 3 is a plan view of a core.

Figure 4 is a side view of a core.

Figure 5 is an end view of a core.

Figure 6 is a view similar to Fig. 1 with the parts moved to the position for removing a core.

Figure 7 is a view in vertical section, taken on line 7—7 of Fig. 6.

Figure 8 is a view partly in vertical section, taken on line 8—8 of Fig. 1.

Figure 9 is a partial sectional view, taken on line 9—9 of Fig. 2.

Figure 10 is a plan view of the core box mounted on a molding machine (only partly illustrated) showing the clamping means for the plate on which the cores are supported when removed from the core box; and

Figure 11 is a view partly in vertical section and partly in front elevation of the mechanism shown in Fig. 10.

Referring to the drawings, the core box comprises a bottom wall 10 and side walls 11. Extending through openings in walls 11 are rods 12 which movably support members 13 and 14 at the front and rear respectively of the core box. The openings in side walls 11 are provided with bushings 15 which may be replaced when wear occurs. The rear end of each of rods 12 is formed with a shoulder 16 against which member 14 abuts. Nuts 17 prevent rods 12 from being withdrawn from member 14 so that the rods and member move as a unit relative to the remainder of the core box. At the forward end of the rods are handles 18 by which member 14 can be moved forwardly and rearwardly until stopped either by the rear surface 19 of walls 11 or by pegs 20.

Member 13 at the forward end of the core box is formed with openings for slidably receiving rods 12. Adjacent each of said openings is a key slot 21 adapted to receive a key 22 on each of the rods when the rods are rotated so that the keys are in registry with the key slots. At such times as keys 22 are in registry with key slots 21, member 13 may be moved forwardly on rods 12 until stopped by pegs 23. Handles 24 on member 13 are provided to slide the member as desired. Immediately adjacent each key slot 21 is a sloping surface 25 adapted to be engaged by the inner end 26 of the key as rods 12 are rotated. The wedging action caused by the engagement of ends 26 with surfaces 25 will draw members 13 and 14 tight against the forward and rear ends respectively of walls 11.

Extending across the middle of the core box is a wall 30 which divides the core box into two compartments so that two sections of the core can be made in one box. In the front compartment is pattern 31 which forms a portion of the mold cavity for a connecting link. Pattern 32 which is joined to pattern 31 forms one-half of the pouring opening of the mold. These patterns are secured to the bottom of the core box and a pair of cores made therefrom forms the upper half of the mold. In the rear compartment is pattern 33 which forms a mold cavity for an-

other portion of the connecting link and a pair of cores made therefrom is used in the bottom half of the mold.

Attached to member 13 are patterns 34 and 35 which form cavities in the core receiving portions of adjacent precast links that are to be joined by the connecting link to be poured in the same core. Member 14 likewise has patterns 36 and 37 for other portions of the precast links. Projections 38, 39, 40 and recesses 41, 42, 43 form respectively recesses and projections in the cores to aid in positioning the cores when they are assembled prior to the pouring operation.

In Figs. 3, 4 and 5 the various mold cavities can readily be distinguished in the views of one of the cores made in the front compartment of the core box. Thus patterns 31 and 32 form cavities 44 and 45 respectively. Pattern 34 forms cavity 46 and pattern 35 forms cavity 47. Depression 42 in the core box forms projection 48 on the core and projection 40 forms depression 49. Depression 41 in member 13 results in projection 50 on the core.

In the process of molding the cores members 13 and 14 are first clamped by keys 22 into engagement with the opposite ends of walls 11. The core box is then filled with core sand of usual composition and the sand rammed well around the patterns. The excess sand is next wiped off flush with the top surface of the core box and a supporting plate placed on the top surface so as to completely cover the cores. Members 13 and 14 are then released by turning handles 18 until keys 22 are in registry with keyslots 21 after which member 13 is pulled forwardly by handles 24 and member 14 is moved rearwardly by pushing on rods 12 thus withdrawing patterns 34, 35 and 36, 37 from the cores. (See Fig. 6.)

The core box is mounted on a molding machine in such a manner that it can be inverted and the supporting plate lowered, thus withdrawing the cores from the core box. The plate and cores can then be transferred to an oven where the cores are baked and ready for use. However, before the core box is inverted the plate must be securely clamped thereto. A particularly simple and effective means for clamping the plate to the core box is shown in Figs. 10 and 11. Only one side of the clamping device is illustrated, it being understood that the other side is the same, the mechanism being symmetrical about the center of the machine. Supporting members 55 on the molding machine provide bearings for trunnions 56 on a cradle 57. The core box is secured to the cradle by machine screws 58. On each side of cradle 57 is a bearing member 59 and a bushing 60 for a shaft 61 which extends above and below the cradle. The shaft has an enlarged portion 62 forming a shoulder 63 that rests on the upper surface of bushing 60 to limit downward movement of the shaft. A collar 64 surrounds a part of portion 62 to give additional support to the shaft. The upper end 65 of each shaft is square and secured thereto by a pin or set-screw 66 is a lever 67 having a tapered roller 68 pivotally mounted thereon.

Extending downwardly from the under side of cradle 57 is a center post 69 upon which a lever 70 is pivotally mounted. A turnbuckle 71 joins lever 70 with an arm 72 secured to the bottom of shaft 61. A compression spring 73 is positioned between arm 72 and the bottom surface of bushing 60 so as to normally pull the shaft downwardly until shoulder 63 is in engagement with the upper surface of bushing 60. It will be ob-

served that the pivotal connection at 74 between turnbuckle 71 and lever 70 is spaced from the pivot point of said lever. Therefore as end 75 of lever 70 is moved to the left (as viewed in Figs. 10 and 11), arm 72, and hence shaft 61, will be rotated in a counter-clockwise direction, Fig. 10, and roller 68 will be moved out of engagement with supporting plate 76 which covers the top of the core box. The released position of roller 68 is shown in dot-dash lines in Fig. 10 and to avoid confusion the position of turnbuckle 71 in released position is illustrated by a dot-dash center line 77.

Supporting plate 76 is formed of a flat bottom portion 78 and upstanding reinforcing ribs 79. At each end of the bottom portion is a sloping surface 80 adapted to be engaged by the adjacent roller 68 as the latter is moved into clamping position. Roller 68 is located vertically on shaft 61 so that in clamping position spring 73 is slightly compressed as is indicated by the position of shoulder 63 which is shown in Fig. 11 raised in relation to the upper surface of bushing 60. As lever 67 is rotated to released position spring 73 pulls shaft 61, and hence lever 67, downwardly until shoulder 63 engages the upper surface of bushing 60. However, when in released position the outermost part of roller 68 is slightly above the lower end of sloping surface 80. Hence, when the roller is moved to clamping position it will roll up surface 80 and raise shaft 61 against the pressure of spring 73. Plate 76 is thus securely held in contact with the core box. The core box may then be inverted in the molding machine and supporting plate 76 released by moving handle 81 at the other end of lever 70 to the position corresponding to that shown in dot-dash lines in Fig. 10. The usual platform of the molding machine (not shown) on which plate 76 rests may then be lowered which results in the cores being withdrawn from the core box. The inner surfaces 82 of walls 11 and surfaces 83 of wall 30 are formed with the usual amount of pattern draft so that the cores will readily slip out of the core box.

It will be observed that in making cores with my improved core box the molder may perform all of the operations from one side of the molding machine since members 13 and 14 and lever 70 are all operable from the front of the core box. Thus the operations may be performed rapidly and effectively by one molder with no loss of time in clamping, releasing and moving the various parts.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What I claim is:

1. A core box comprising bottom and side walls, a movable member extending through each side wall, front and rear walls mounted on said members, said rear wall being secured to said members for movement therewith, said front wall being slidable on said members for movement forwardly and rearwardly of said box, and wedging means on said members and front wall for forcing said front and rear walls into engagement with the ends of said side walls.

2. A core box comprising bottom and side walls, movable means extending through said side walls, a rear wall mounted on said movable means for movement therewith forwardly and

rearwardly of said core box, a front wall slidably mounted on said movable means for independent movement forwardly and rearwardly of said core box, and wedging means on said front wall and said movable means for wedging said front and rear walls into engagement with the ends of said side walls.

3. A core box comprising bottom and side walls, movable means extending through said side walls, a rear wall mounted on said movable means for movement therewith forwardly and rearwardly of said core box, a front wall slidably mounted on said movable means for independent movement forwardly and rearwardly of said core box, a pair of keyways in said front wall and a pair of keys on said movable means adapted, in one position of said movable means, to permit forward and rearward movement of said front and rear walls and in another position to wedge said front and rear walls into engagement with the ends of said side walls.

4. A core box for making chain comprising a bottom wall having patterns for portions of a pair of connecting links secured thereto, side

walls, movable front and rear walls having patterns for portions of precast links secured thereto, and means for controlling movement of said rear wall from the front of said core box comprising a pair of members extending through said front, side and rear walls and adapted to move with said rear wall relative to said front and side walls.

5. A core box for making chain comprising a bottom wall having patterns for portions of a pair of connecting links secured thereto, side walls, movable front and rear walls having patterns for portions of precast links secured thereto, means for controlling movement of said rear wall from the front of said core box comprising a pair of members extending through said front, side and rear walls and adapted to move with said rear wall relative to said front and side walls, and means on said controlling means adapted to engage said front wall to wedge said front and rear walls into engagement with said side walls.

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