Nov. 1, 1927. 1,647,706

A. R. McARTHUR

METHOD OF AND APPARATUS FOR STRAIGHTENING ANNEALING BOXES

Filed March 24. 1926 3 Sheets-Sheet 1

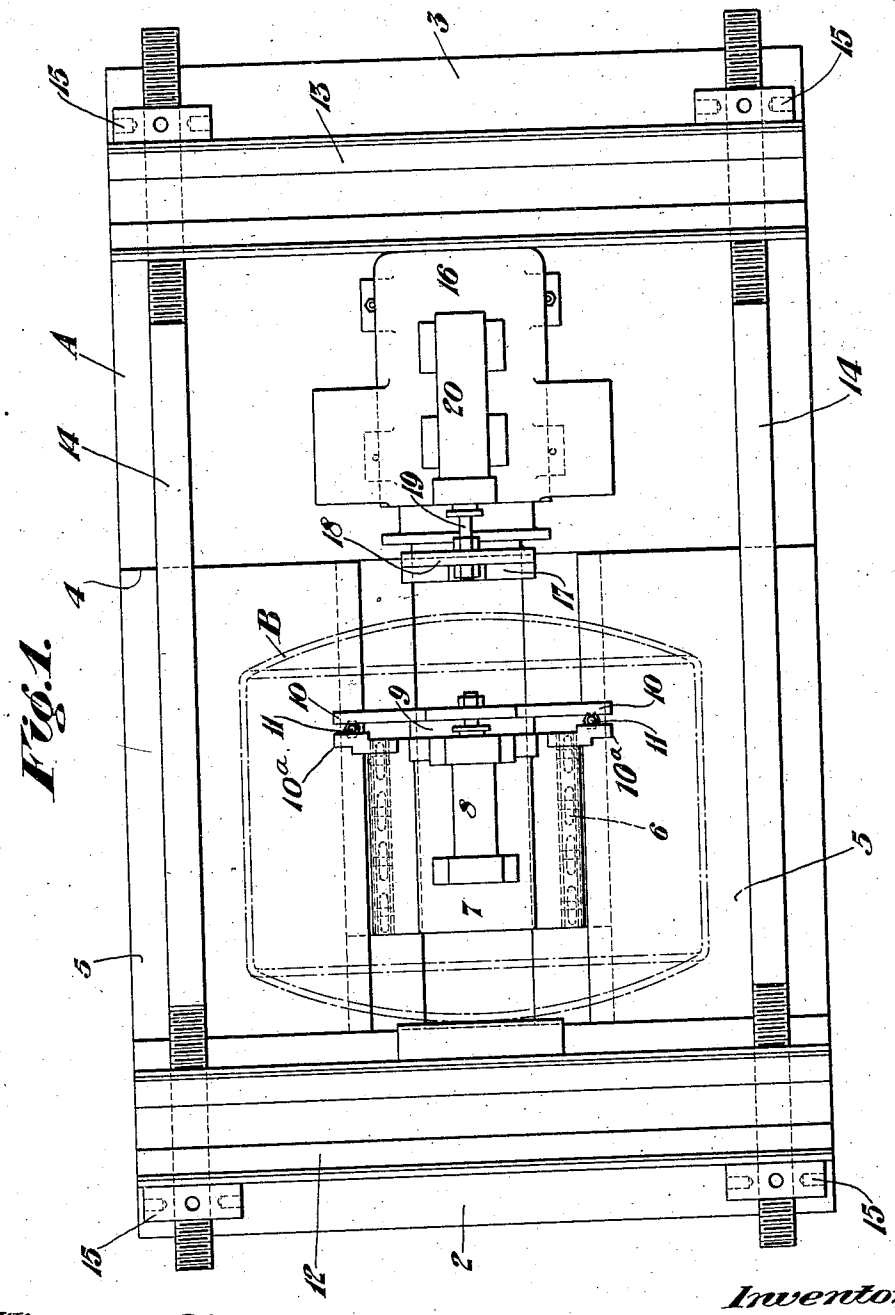


Fig. 1.

Witnesses:
Edwin Trueb

Inventor:
ARTHUR R. McARTHUR,
by: D. Anthony Usina
his Attorney.

Nov. 1, 1927. 1,647,706

A. R. McARTHUR

METHOD OF AND APPARATUS FOR STRAIGHTENING ANNEALING BOXES

Filed March 24. 1926 3 Sheets-Sheet 2

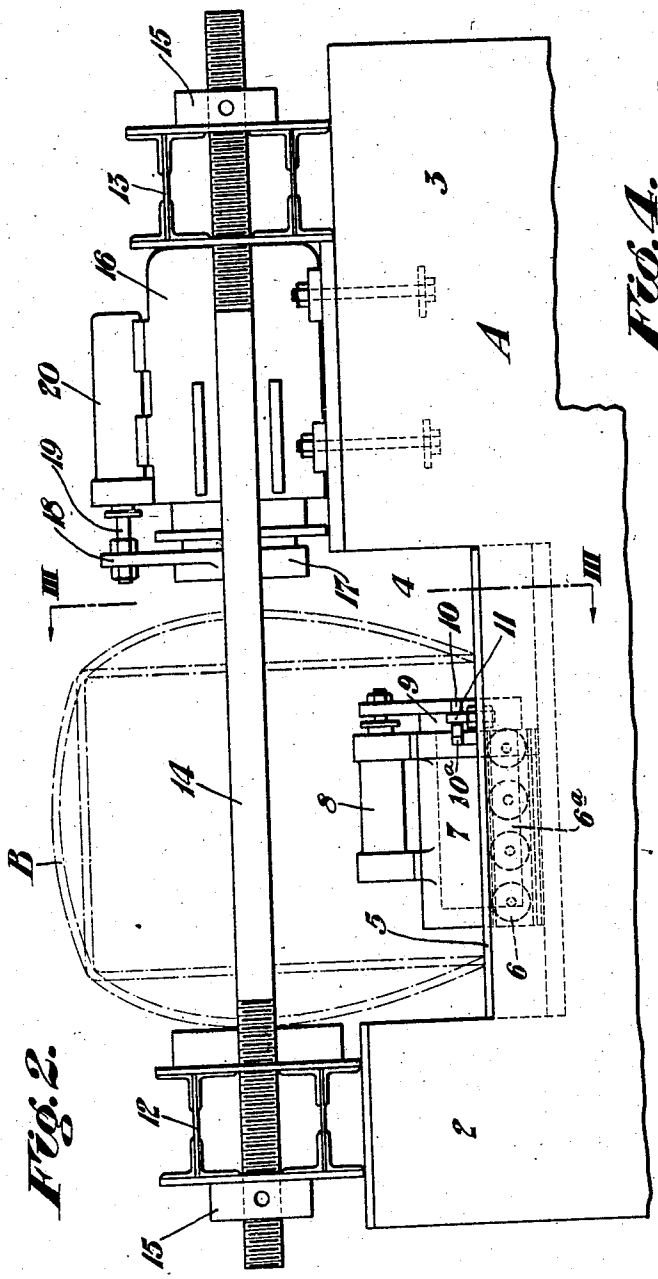


Fig. 2.

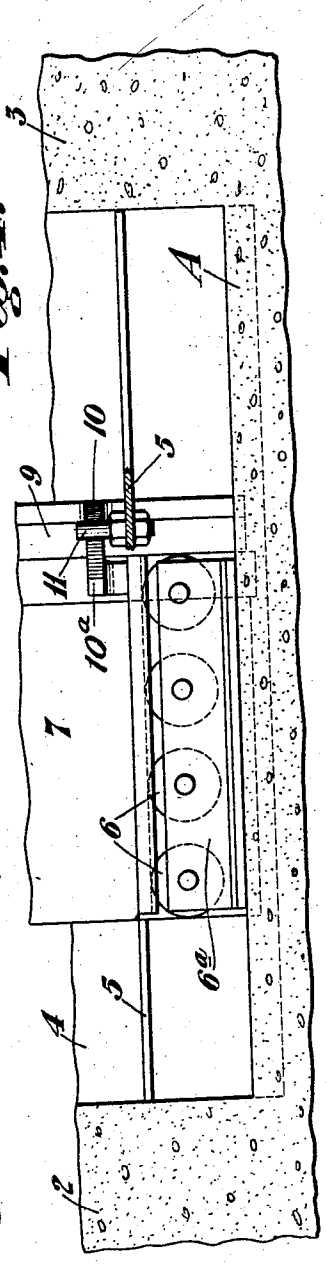


Fig. 4.

Witnesses:
Edwin Trueb

Inventor:
ARTHUR R. McARTHUR,
by: D. Anthony Usina
his Attorney.

Nov. 1, 1927. 1,647,706

A. R. McARTHUR

METHOD OF AND APPARATUS FOR STRAIGHTENING ANNEALING BOXES

Filed March 24, 1926 3 Sheets-Sheet 3

Fig. 3.

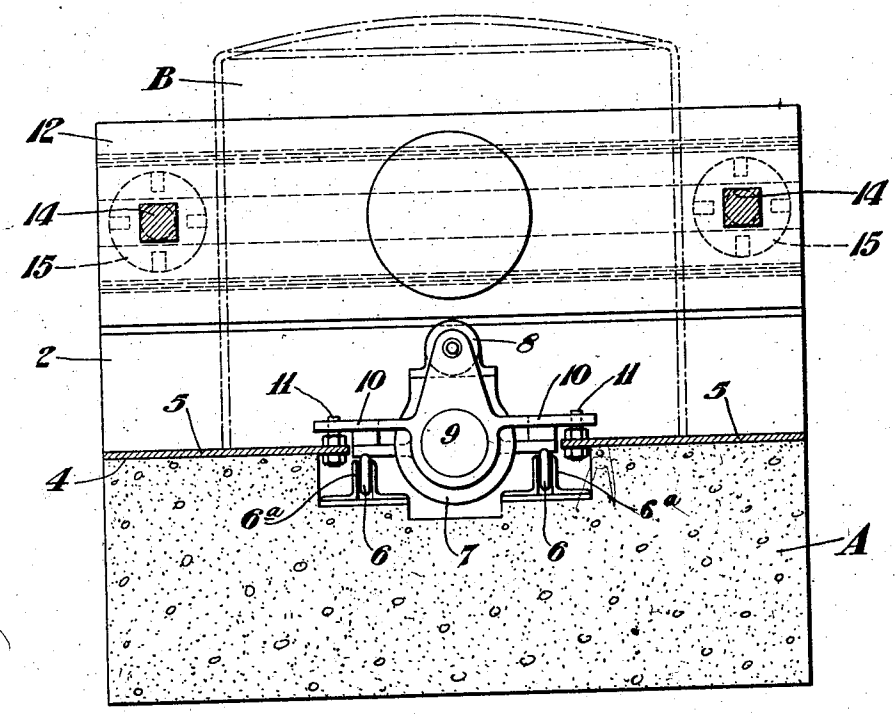
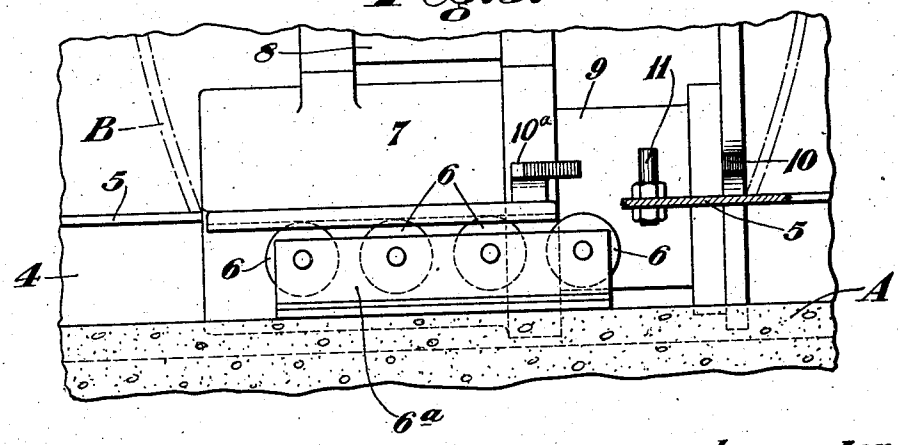


Fig. 5.



Witnesses:
Edwin Trueb

Inventor:
ARTHUR R. McARTHUR,
by: D. Anthony Usina
his Attorney.

Patented Nov. 1, 1927. 1,647,706

UNITED STATES PATENT OFFICE.

ARTHUR R. McARTHUR, OF GARY, INDIANA, ASSIGNOR TO AMERICAN SHEET AND TIN PLATE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

METHOD OF AND APPARATUS FOR STRAIGHTENING ANNEALING BOXES.

Application filed March 24, 1926. Serial No. 97,053.

This invention relates to methods of and apparatus for straightening distorted side walls of annealing boxes, and has for its object the provision of a method and apparatus which will materially lessen the cost of this operation.

After annealing boxes have been put into use, the continual expansion and contraction to which they are submitted causes their side walls to buckle and become distorted. Heretofore it has been the practice to send the annealing boxes to the shop to be straightened, which involved labor and expense in handling and transporting, and the expense of the labor necessary to straighten the boxes.

The present invention provides apparatus adapted to be located in the mill where the boxes are in use, and the novel method of this invention is adapted to be practiced with this apparatus by the annealing crane crew during spare time, thus eliminating all the cost heretofore involved in the straightening of the boxes.

In the drawings:

Figure 1 is a plan view of the apparatus.

Figure 2 is a side elevation thereof.

Figure 3 is a sectional view thereof on the line III—III of Figure 2.

Figure 4 is an enlarged fragmentary detail view showing the jack, for engaging the inside of the boxes to be straightened, retracted.

Figure 5 is a similar view showing the jack extended.

Referring more particularly to the drawings, the letter A designates the base as a whole, which is formed from concrete and has side members 2 and 3 and a central recess or depressed box receiving portion 4 in which the box B to be straightened is mounted. The portion 4 has a metal bottom or wear-plate 5 therein to prevent the annealing boxes wearing the concrete.

A series of rollers 6 are mounted in bearings 6^a below the plate 5, and a hydraulic jack 7 is mounted on the rollers 6 and freely movable transversely of the base A. The jack 7 is of well-known standard design and is provided with an air cylinder 8 for retracting its plunger 9.

The head of the plunger 9 is provided with arms 10 adapted to engage stop-lugs 11 on the plate 5 for a purpose to be described. The jack 7 is also provided with stop lugs or arms 10^a adapted to engage the stop lugs 11.

Cross-heads 12 and 13 are mounted on the top of the side portions 2 and 3 of the base A and are adjustably tied together by tie rods 14 having adjusting nuts 15 threaded thereon.

A hydraulic jack 16 of standard design, is mounted on the side member 3 in front of the cross-head 13 so as to be backed up thereby. The head of the plunger 17 of the jack 16 is provided with an extension 18 which is connected to the plunger rod 19 of an air cylinder 20 which is adapted to be operated to retract the plunger 17 of the jack.

In carrying out my improved method by the apparatus above described, a box B is positioned in the recess or depression 4 and fluid is then admitted to the jack 7 to extend the jack and cause the plunger 9 to engage one side wall of the box adjacent its lower edge, while the rear end of the jack cylinder will engage the other side wall of the box adjacent its lower edge. The admission of fluid to the jack 7 will be continued until the jack has pushed the lower edges of the side walls of the box out into normal or straight line position, at which time the supply of fluid to the jack will be stopped and the jack will remain stationary in its extended position to hold the lower edges of the side walls in position.

Fluid under pressure will then be admitted to the jack 16 causing its plunger 17 to be extended and to engage the bulged or buckled portion of the side wall of the box nearest the jack, and to push the box bodily sidewise until the opposite side wall of the box engages the cross-head 12. The box will then be held stationary and as the extension of the plunger 17 continues, the side walls of the box will be pressed or forced

inwardly by the cross-head 12 and plunger 17 until they return to normal straight line position. The fluid will then be cut off from the jack 16.

During the operation of the jack 16 when the box B is moved bodily toward the cross-head 12, the jack 7 will be also moved since it is engaged with the lower edges of the side walls of the box.

After the side walls of the box have been straightened, air will be admitted to the cylinder 8 to retract the jack 7, and the plunger 9 of the jack will be retracted until the arms 10 engage the stop-lugs 11, continued operation of the air cylinder 8 will then move the body of the jack 7 toward the plunger 9 until the stop arms 10^a engage the stop lugs 11 and thereby center the jack in readiness for operation on another box.

After the jack 7 has been retracted, air will be admitted to the air cylinder 20 to retract the jack 16 and the box B will be removed by the usual annealing cranes.

While I have described one specific embodiment of my invention and certain specific steps of my novel method, it will be understood that I do not wish to be limited thereto, since various modifications may be made without departing from the scope of my invention as defined in the appended claims.

I claim:

1. An apparatus for straightening the side walls of annealing boxes comprising a base adapted to receive the box to be straightened, a jack mounted on said base and adapted to engage and force the lower edges of the side walls of the box outwardly into proper position, and independently operated means for engaging the outer surfaces of the side walls of the box to force said walls inwardly into straight line position.

2. An apparatus for straightening the side walls of annealing boxes comprising a base adapted to receive the box to be straightened, a jack mounted on said base and adapted to engage and force the lower edges of the side walls of the box outwardly into proper position, and an independently operated jack adapted to force the side walls of the box inwardly into straight line position.

3. An apparatus for straightening the side walls of annealing boxes comprising a base adapted to receive the box to be straightened, a jack movably mounted on said base and adapted to engage and force the lower edges of the side walls of the box outwardly into proper position, and independently operated means for engaging the outer surfaces of the side walls of the box to force said walls inwardly into straight line position.

4. An apparatus for straightening the side walls of annealing boxes comprising a a base having a depressed portion in which the annealing box to be straightened is adapted to be positioned, a jack mounted in said depressed portion of said base and movable bodily transversely thereof, said jack being adapted to be extended so as to force the lower edges of the side walls of the box outwardly into straight line position, means for retracting said jack, and an independently operated jack adapted to force the side walls of the box inwardly into straight line position.

5. An apparatus for straightening the side walls of annealing boxes comprising a base having a depressed portion in which the annealing box to be straightened is adapted to be positioned, a jack mounted in said depressed portion of said base and movable bodily transversely thereof, said jack being adapted to be extended so as to force the lower edges of the side walls of the box outwardly into straight line position, means for retracting said jack, cross-heads on each side of said base, means connecting said cross-heads, and a jack mounted on said base and backed up by one of said cross-heads, said jack being adapted to be extended to engage the one side wall of the box being straightened and to move said box into engagement with the other of said cross-heads, said operation being continued until the side walls of said box are collapsed into a straight line position.

6. An apparatus for straightening the side walls of annealing boxes comprising a base having a depressed portion to receive the annealing box to be straightened, a jack mounted in said depressed portion of said base and bodily movable transversely thereof, said jack being adapted to be extended to force the lower edges of the side walls of the box outwardly into straight line position, means for retracting said jack, cross-heads on each side of said base, means connecting said cross-heads, a jack mounted on said base and backed up by one of said cross-heads, said jack being adapted to be extended to engage the one side wall of the box being straightened and to move said box into engagement with the other cross-head, said operation being continued until the side walls of said box are collapsed into a straight line position, and means for retracting said last named jack.

7. The method of straightening the bulged and distorted side walls of annealing boxes, which consists in forcing the lower edges of said side walls outwardly into original straight line position, holding the lower edges of said side walls in this position, and then applying pressure to the outer surfaces of said side walls to collapse said walls into original straight line position.

8. The method of straightening the bulged

and distorted side walls of annealing boxes, which consists in forcing the lower edges of said side walls outwardly into original straight line position, holding the lower edges of said side walls in this position, and then simultaneously applying pressure to the outer surfaces of said side walls to collapse said walls into original straight line position while still holding the lower edges of said walls in their straightened position.

In testimony whereof, I have hereunto set my hand.

ARTHUR R. McARTHUR.