

April 14, 1964

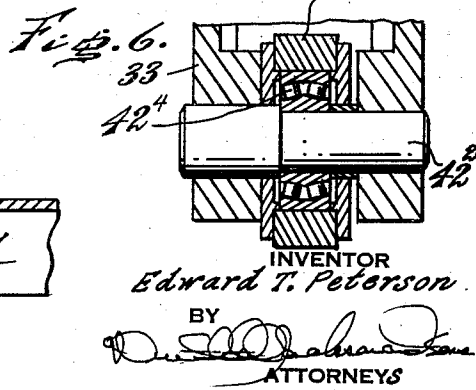
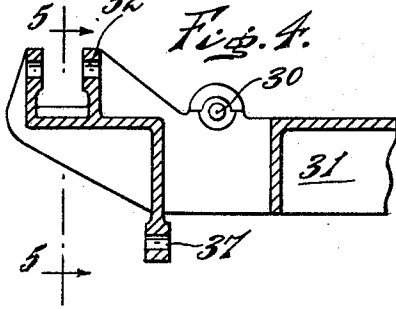
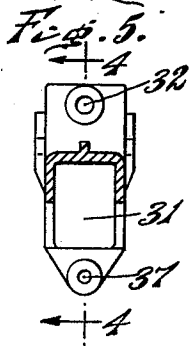
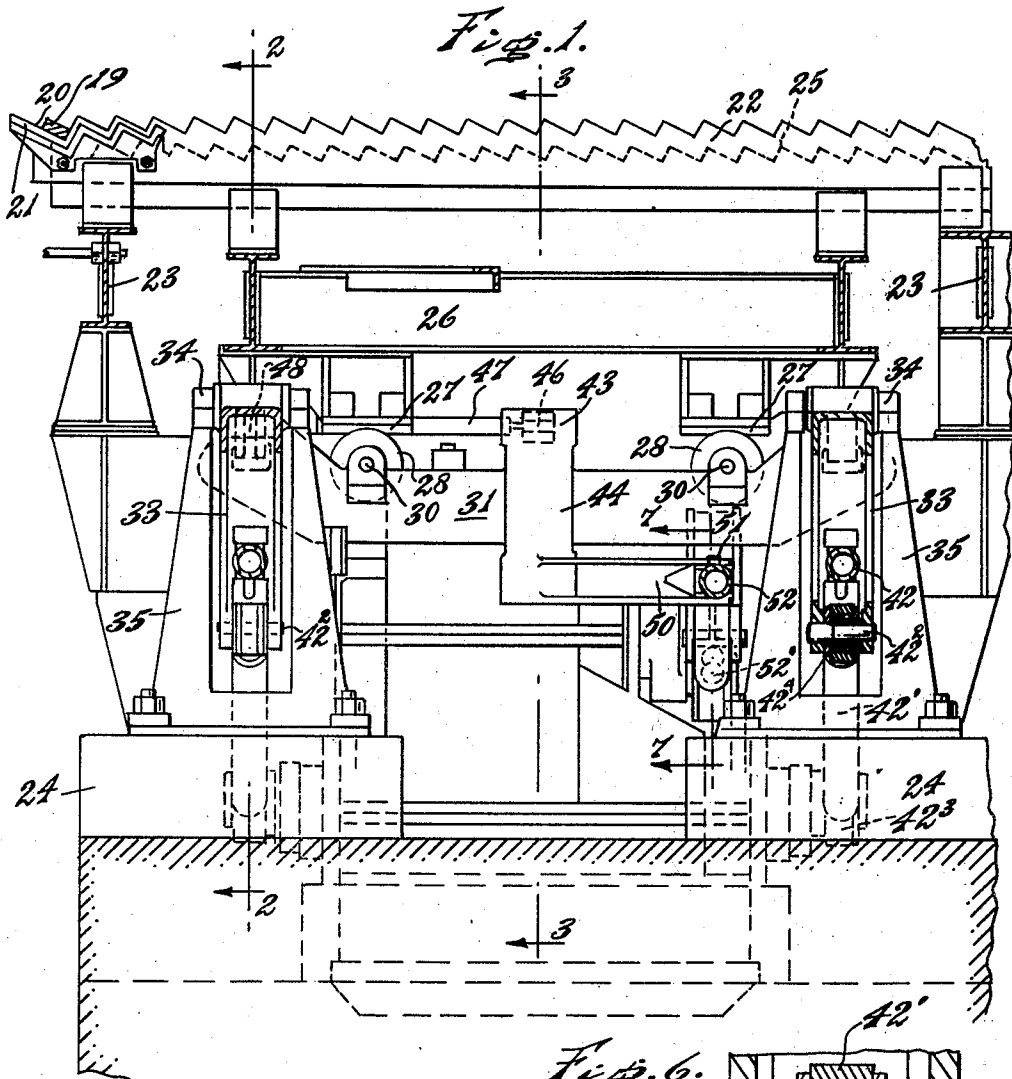
E. T. PETERSON

3,128,651

COOLING BED

Filed May 5, 1961

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Fig. 2.

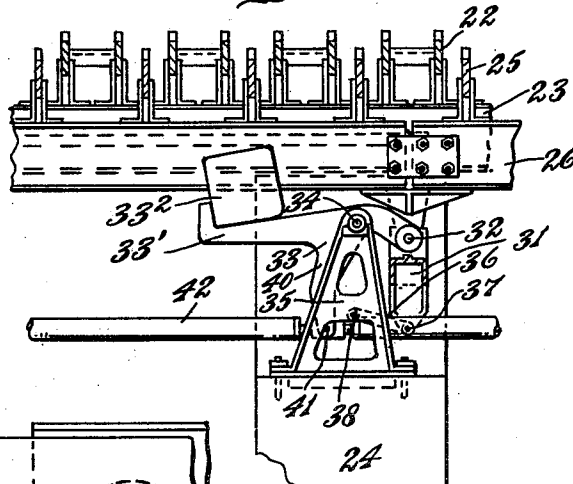


Fig. 7.

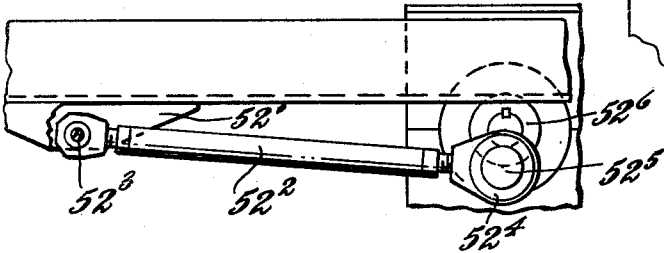
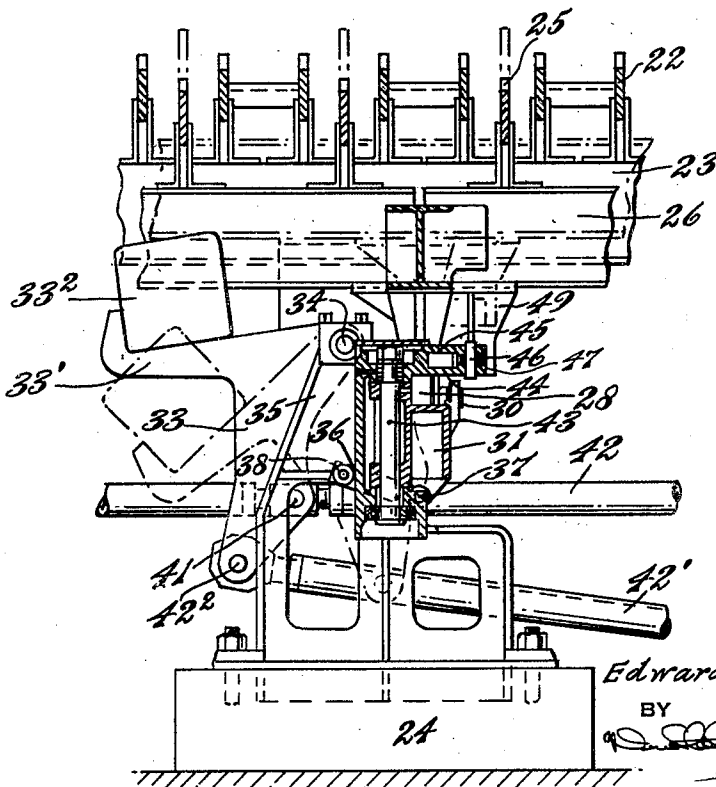
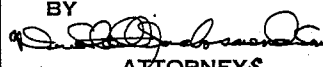


Fig. 3.



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3,128,651

COOLING BED

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Filed May 5, 1961, Ser. No. 107,981

4 Claims. (Cl. 80-42)

The present invention relates to cooling beds of the type which manipulate work bars successively over a notched bar section.

A purpose of the invention is to provide a more simple and inexpensive mechanism for operating the notched bar section of a cooling bed.

A further purpose is to reduce the amount of head room required beneath a cooling bed for the operating mechanism.

A further purpose is to render a cooling bed more sturdy and reliable in service and reduce the need for maintenance.

A further purpose is to provide one set of relatively stationary notched bars and one set of notched bars which move horizontally by the action between tracks and rollers and which move vertically by the action of the bellcranks.

A further purpose is to support rollers on cross beams and to hold the cross beams in vertical position as they are raised and lowered by parallel linkages.

A further purpose is to mount levers on moving cross beams for moving the movably notched bars horizontally.

A further purpose is to provide a connecting rod which accommodates motion of one end pivot in a plane not parallel to the instantaneous direction of motion of the other end pivot.

A further purpose is to provide a connecting rod which will accommodate normal construction misalignment and misalignment due to unequal thermal expansion of the supporting structure without binding in operation.

Further purposes appear in the specification and in the claims.

In the drawings I have chosen to illustrate one only of the numerous embodiments in which my invention may appear, selecting the form shown from the standpoints of convenience in illustration, satisfactory operation and clear demonstration of the principles involved.

FIGURE 1 is a section of a cooling bed of the invention in the direction parallel to the length of the notched bars.

FIGURE 2 is a fragmentary section on the line 2-2 of FIGURE 1.

FIGURE 3 is a fragmentary section on the line 3-3 of FIGURE 1.

FIGURE 4 is a fragmentary section of the cross beam, the section being generally longitudinal and taken on the line 4-4 of FIGURE 5.

FIGURE 5 is a section of the cross beam on the line 5-5 of FIGURE 4.

FIGURE 6 is an enlarged fragment of FIGURE 1 showing the spherical bearing.

FIGURE 7 is a fragmentary view taken on the line 7-7 of FIGURE 1, illustrating the mechanism for driving the lever arms 50.

Describing in illustration but not in limitation and referring to the drawings:

The present invention is concerned with an improved operating mechanism for a notched bar cooling bed. The invention is designed to produce a relatively inexpensive, reliably low maintenance mechanism, which will occupy a minimum of space and will thus reduce the cost for preparing foundations.

The cooling bed, as best seen in FIGURE 1, receives work bars 19 in notch 20 at the left of a notched apron 21 which is adjoining a run-in table, as well known. The stationary set of transferring notched bars 22 extends

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across the cooling bed and the notched bars 22 are supported on beams 23 from a foundation construction 24.

Interspersed among the stationary notched transferring bars 22 and entering into grooves of the apron are movable suitably notched transferring bars 25 which are mounted on supports 26, generally horizontal in position, which carry horizontal downwardly disposed rails 27 extending in the direction of horizontal motion of bars 25.

The rails are received, supported and guided by flanged rollers 28 pivoted at 30 on opposite ends of cross beams 31 which extend generally horizontally beneath the transferring bars.

The cross beams at their opposite ends pivotally connect at 32 with bellcranks 33 which are pivotally mounted at 34 on standards 35 supported from the foundation 24. The cross beams are held vertically by parallel linkages. Stabilizing link 36 pivotally connects at one end at 37 to the bottom of one cross beam 31 and pivotally connects to the standards at 38. The distance between pivots 32 and 34 at the top is the same as the distance between pivots 37 and 38 at the bottom and the distance between pivots 32 and 37 on the right is the same as the distance between pivots 34 and 38 on the left, so that a parallelogram of levers is formed.

The bellcranks have arms 40, best seen in FIGURE 2, which pivotally connect at 41 to connecting rods 42 which extend across the machine and are suitably actuated by connecting rod 42' pivoted at 42² to one of the bellcranks and manipulated by crank drive 42³. The pivot 42² to the connecting rod 42' includes a spherical bearing 42⁴ so that the connecting rod can correct for misalignment, and a similar spherical bearing (not shown) is provided at the other end of connecting rod 42'. Each bellcrank 33 has an arm 33' which carries counterweight 33².

Near the middle of each cross beam 31 there is a vertical pivot 43, best seen in FIGURE 3, which pivotally mounts a lever 44 which has an arm 45 at its upper end which pivotally connects at 46 with connecting rod 47, the opposite end of which pivotally connects at 48 with abutment 49 on the support 26. Each lever 44 also has an arm 50 which pivotally connects at 51 with connecting rods 52 which run from one cross beam to the next. At one point along their length in series with the connecting rods 52 and connected to the pivots 51 is a beam section 52' of the connecting rods 52. Actuation of the connecting rods 52 is accomplished by a crank drive consisting of a connecting rod 52² which is pivotally connected at 52³ to the beam section 52' of the connecting rod 52 by a spherical bearing and at the opposite end is pivotally connected at 52⁴ to crank pin 52⁵ on crank shaft 52⁶ by a spherical bearing. The spherical bearings 52³ and 52⁴ are similar to that illustrated in FIGURE 6 and permit pivoting motion on an axis which shifts as the arm 50 turns in order to move the cooling bed bars horizontally. The motion illustrated in FIGURE 7 is transmitted to the other lever arms 50 by connecting rod 52.

It will be evident that if the crank for the horizontal drive and the crank for the vertical drive are displaced 90°, and both have the same rotational speed, a generally circular or elliptical motion can be imparted to the transferring bars 25, such that the material in the notches will move freely over the crests of the stationary bars and be deposited in the next notch.

Thus if the crank length and lever ratio for horizontal motion and vertical motion make the horizontal and vertical motion of the moving notched bars equal, the moving notched bars and the stock resting on them will travel in a circular path. On the other hand, if the horizontal motion is greater than the vertical motion, the moving notched bars and the stock on them will travel in an elliptical path with the major axis horizontal. Again, if the vertical motion is greater than the horizontal motion, the moving

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notched bars and the stock resting on them will travel in an elliptical path with the major axis vertical.

This combination of various possible paths is desirable as it makes it possible to fit in the motion of the bed with various notch proportions dictated by different kinds of work. It is unusual to obtain this combination of possible paths in a cooling bed of such simple construction.

The horizontal drive is capable of operating notwithstanding that the cross beams are moving up and down, and this is a very desirable feature of the device.

In operation, work bars travelling on the cooling bed run-in table are kicked off into the first notch 20 and slide to a stop, the notches being suitably chamfered to avoid danger of striking against the end of the bar. At this time the movable transferring notch bars 25 are desirably in a position below the stationary bars 22. After the work bar 19 has stopped in the first notch 20, the cooling bed runs for one cycle and transfers the work bar to the next notch. It is then just a matter of repetition to transfer the work bar 19 to successive notches. The cooling bed can be operated to run only one cycle and then stop under limit switch control or it can run indefinitely through repeated cycles as desired.

In view of my invention and disclosure, variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the structure shown, and I, therefore, claim all such insofar as they fall within the reasonable spirit and scope of my claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a cooling bed, a first set of relatively stationary notched bars extending generally horizontally, a second set of relatively movable notched bars extending generally horizontally and interspersed among the bars of the first set, a support for the bars of the second set, rails on the support extending generally horizontally in the direction of horizontal motion of the bars of the second set, stationary standards, vertically movable horizontal cross beams adapted to remain horizontal beneath the rails, rollers on the cross beams engaging the rails, levers pivotally connected at both ends of the cross beams for manipulating the cross beams vertically comprising bellcranks pivotally connected to the standards at a relatively upper position and pivotally connected to the cross beams near the top, an equalizing link connected to a cross beam near the bottom and pivotally connected to a lower portion of one of the standards, the equalizing link being parallel to the bellcrank position at the top of the lever, a connecting rod and a spherical bearing interconnecting the connecting rod with one of the levers for actuating the levers in unison and means for driving the support horizontally on the rollers.

2. In a cooling bed, a first set of relatively stationary

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notched bars extending generally horizontally, a second set of relatively movable notched bars extending generally horizontally and interspersed among the bars of the first set, a support for the bars of the second set rigidly connected to the said second set, rails on the support extending generally horizontally in the direction of horizontal motion of the bars of the second set, vertically movable horizontal cross beams beneath the rails, rollers at each end on the cross beam engaging the rails, means for raising and lowering the cross beams, levers vertically pivoted on the cross beams, connecting rods pivotally connected at one end to the vertically pivoted levers and at the other end to the supports and means for actuating the vertically pivoted levers.

3. A cooling bed of claim 2, in which the means for actuating the vertically pivoted levers comprises crank means and a connecting rod pivotally connected to the crank means on a spherical pivot and pivotally connected to each lever on a spherical pivot.

4. In a cooling bed, a first set of relatively stationary notched bars extending generally horizontally, a second set of relatively movable notched bars extending generally horizontally and interspersed among the bars of the first set, a support for the bars of the second set rigidly connected to the said bars, rails on the bottom of the support extending generally horizontally in the direction of horizontal motion of the bars of the second set, vertically movable horizontal cross beams beneath the rails, rollers on the cross beams engaging the bottoms of the rails, bellcranks pivotally connected to the opposite ends of the cross beams near the top, standards pivoting the bellcranks on horizontal pivots, the pivotal connection of the bellcranks to the standards being at a relatively upper position, an equalizing link pivotally connected to a cross beam near the bottom and pivotally connected to a lower portion of one of the standards, said equalizing link being parallel to the bellcrank portion at the top of said bellcrank, means for actuating the bellcranks in unison and thus raising and lowering the cross beams, levers vertically pivoted on the cross beams, connecting rods pivotally connected at one end to said vertically pivoted levers and at the other end to said supports and means for actuating said vertically pivoted levers in unison.

References Cited in the file of this patent

UNITED STATES PATENTS

451,175	Worms et al.	Apr. 28, 1891
1,027,124	Griffith	May 21, 1912
1,834,728	Peterson	Dec. 31, 1931
2,067,524	Flaherty	Jan. 12, 1937

FOREIGN PATENTS

746,917	Germany	Aug. 30, 1944
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