

March 2, 1937.

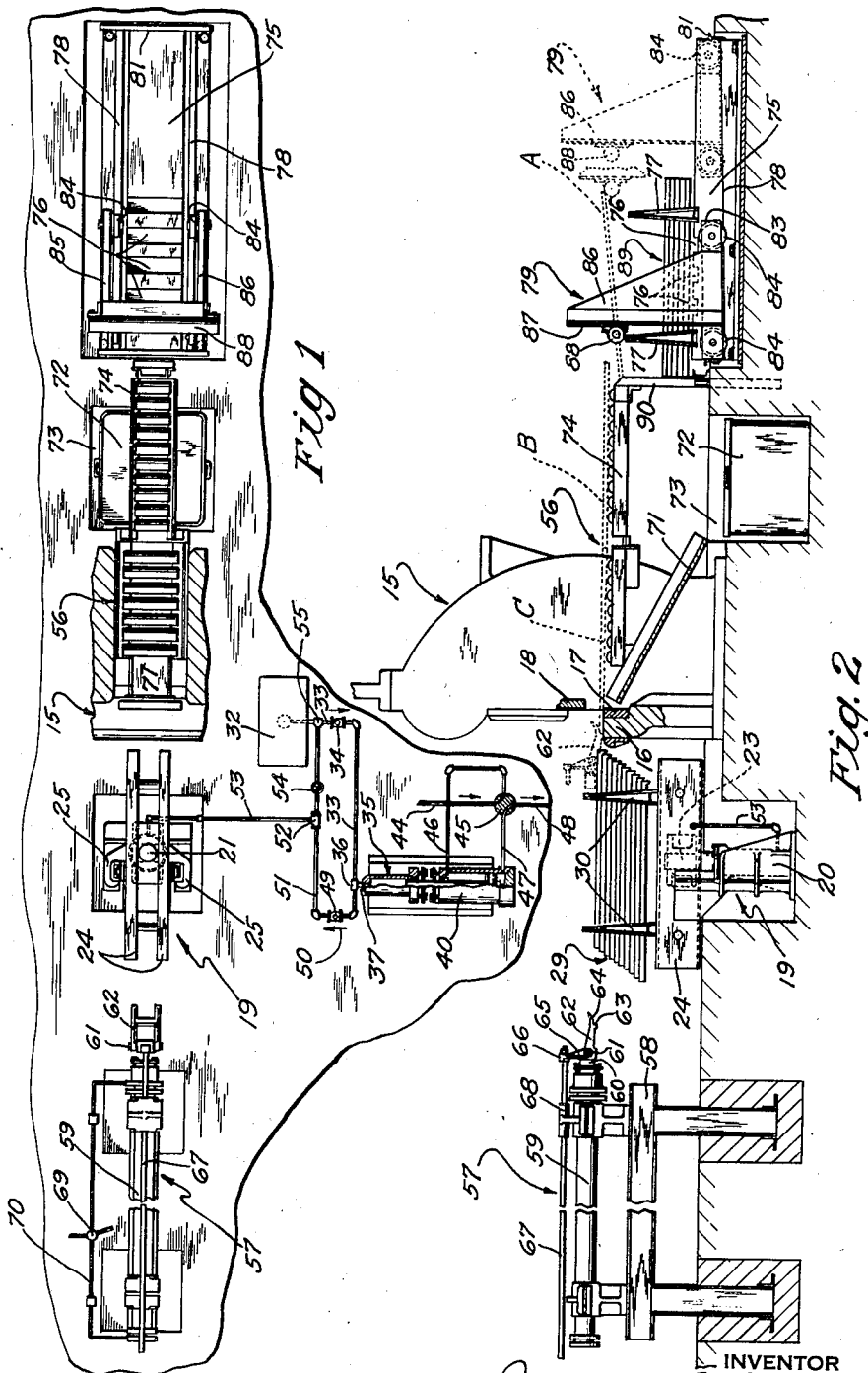
J. R. COE

2,072,667

ARTICLE PILER

Filed Aug. 2, 1934

3 Sheets-Sheet 1



INVENTOR
James R. Coe.
BY
Wooster Davis
ATTORNEYS.

March 2, 1937.

J. R. COE

2,072,667

ARTICLE PILER

Filed Aug. 2, 1934

3 Sheets-Sheet 2

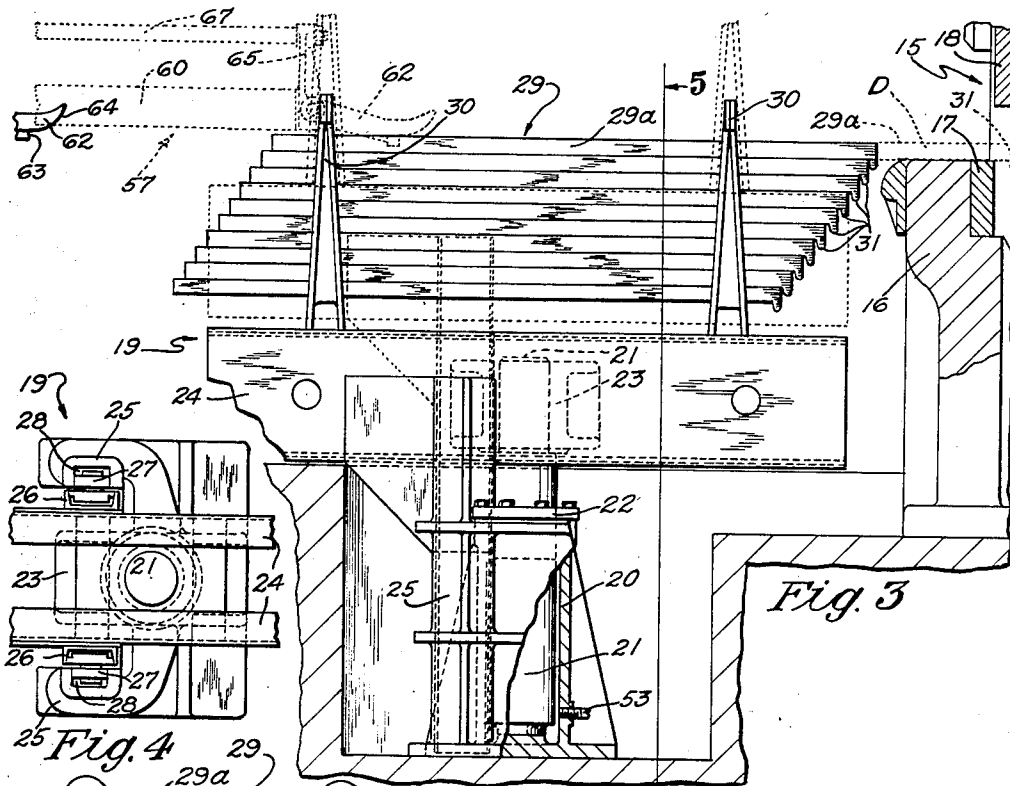
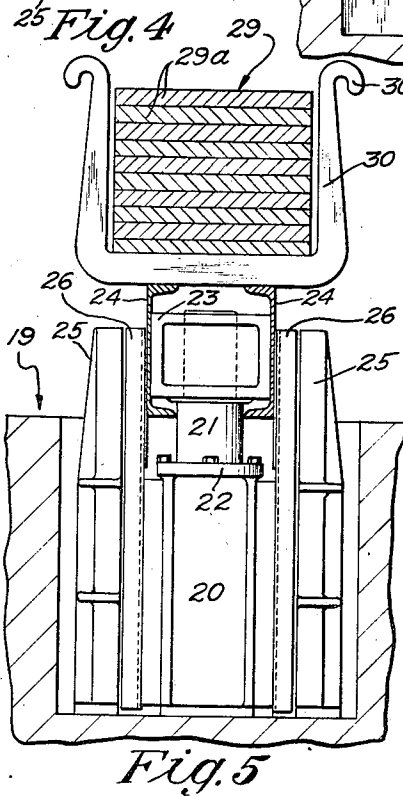
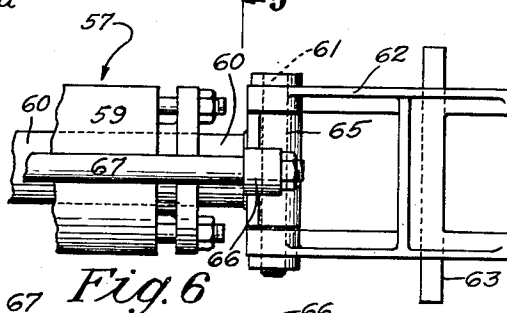
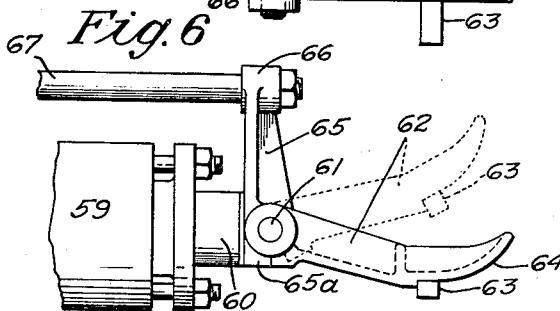


Fig. 7

INVENTOR
James R. Coe
BY
Walter Davis
ATTORNEYS

March 2, 1937.

J. R. COE

2,072,667

ARTICLE FILER

Filed Aug. 2, 1934

3 Sheets-Sheet 3

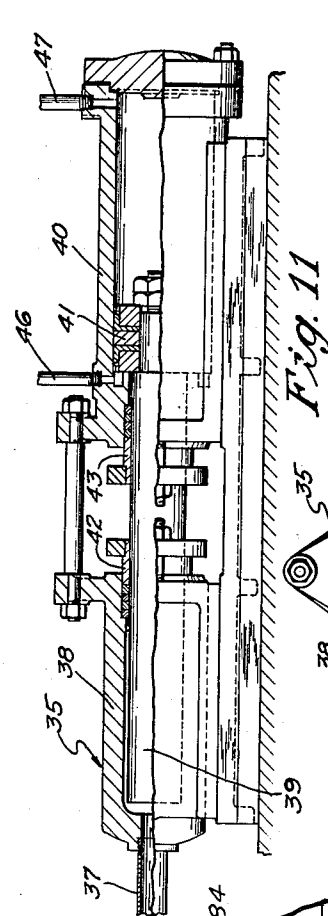


Fig. 11

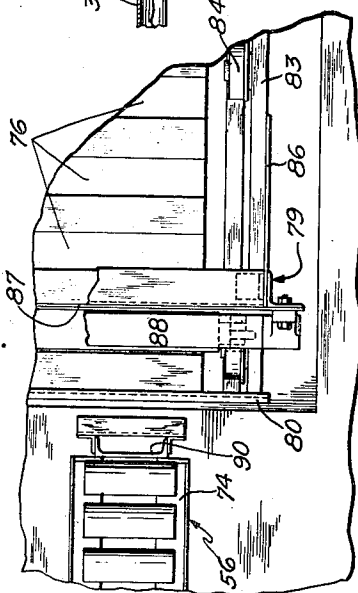


Fig. 8

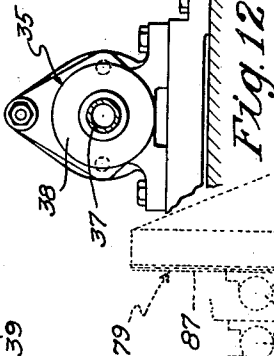


Fig. 12

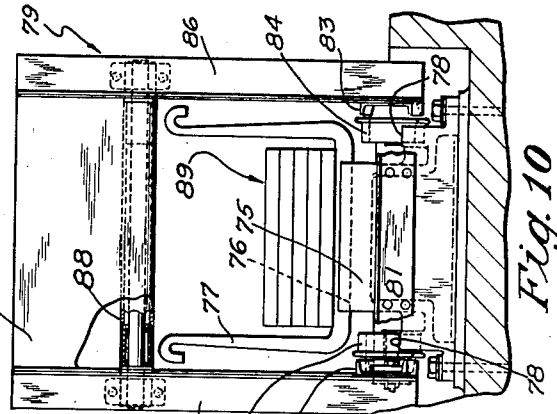


Fig. 10

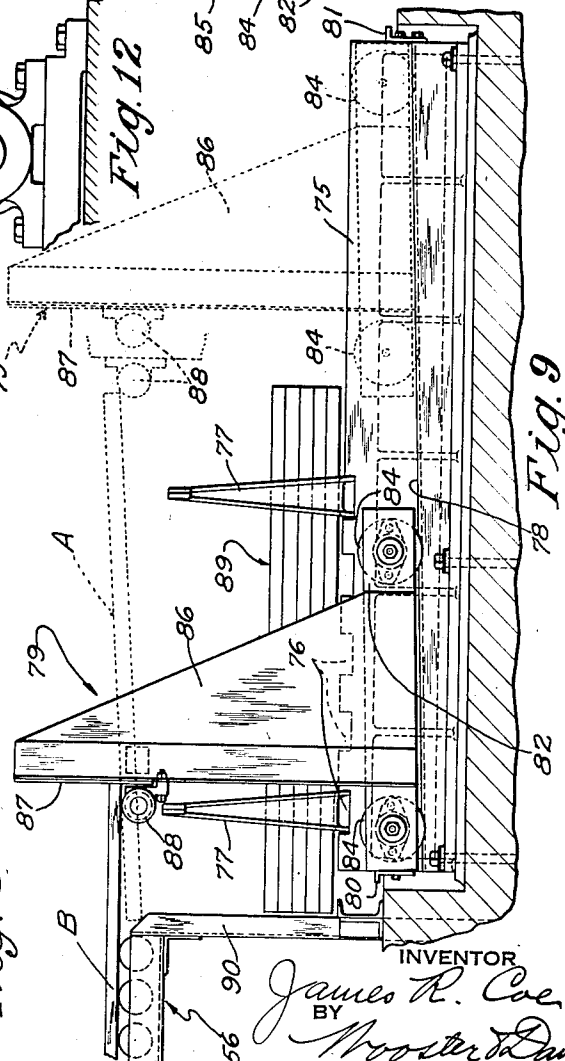


Fig. 9

INVENTOR
James R. Coe
BY
Wooten Davis
ATTORNEYS

UNITED STATES PATENT OFFICE

2,072,667

ARTICLE PILER

James R. Coe, Watertown, Conn., assignor to The
American Brass Company, Waterbury, Conn.,
a corporation of Connecticut

Application August 2, 1934, Serial No. 738,086

11 Claims. (Cl. 214—6)

This invention relates to new and useful improvements in mill equipment and methods and has particular relation to apparatus and methods for handling comparatively heavy bars at a shear or the like.

An object of the invention is to provide means and method whereby with a minimum of manual effort heavy castings may be efficiently handled at a shear designed to shear or crop the so-called gate from one end of each casting.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a top plan view showing somewhat diagrammatically the general arrangement of the various mechanisms;

Fig. 2 is a side elevational view of the mechanisms of Fig. 1;

Fig. 3 is a side elevational view on an enlarged scale showing an elevator employed and its relation to a shear;

Fig. 4 is an enlarged top plan view of the elevator;

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 3;

Fig. 6 is a top plan view on an enlarged scale of a pusher employed;

Fig. 7 is a side elevational view of the pusher as shown in Fig. 6;

Fig. 8 is a top plan view, on an enlarged scale, showing a portion of a table and piling car used;

Fig. 9 is a side elevational view on the same scale showing the piling car and associated mechanism;

Fig. 10 is a view looking from the right in Fig. 9, parts being broken away;

Fig. 11 is a view partly in section and partly in elevation showing a pump employed; and

Fig. 12 is an end elevational view looking from the left in Fig. 11.

In the operation of the present means a stack of castings such as flat bars from which the gates are to be cropped are placed on an elevator in front of a shear with the topmost casting of the stack at a height to be moved substantially horizontally into the shear. Power means are provided for moving the castings one

at a time to the shear, and as the gates are sheared off the castings are moved through the shear. After a casting is moved off the elevator the latter is raised a distance equal to the thickness of a casting so that the uppermost casting on the elevator is then at a height to be moved forwardly to the shear.

From the shear the castings are moved onto a receiving table at the rear of which is a piling car straddling casting carriers on the base of the machine. As a casting is moved along the receiving table the most advanced or forward end of the casting after leaving the table engages the piling car and moves it rearwardly beyond the casting carriers, and the said car supports the front end of said casting until the rear end thereof moves off the receiving table when the casting falls to the carriers and the car is again advanced to position at the rear of the table. When the castings which have fallen to the pile form a stack the car is moved back or held back of such castings, and by means of a crane or the like the carriers and castings are removed. Now other carriers are positioned and the car is returned to normal position and a new stack of castings from which the gates are to be sheared is placed on the elevator.

Referring in detail to the drawings the shear of any desired construction is generally designated 15 and includes a table 16, a stationary lower shear blade 17 and a movable upper shear blade 18. As shown best in Figs. 1, 2, and 3 a hydraulic elevator generally designated 19 is arranged forwardly of the shear 15, and such elevator comprises a support for a stack of castings from which the gates are to be sheared. Elevator 19 includes a cylinder 20 in which is vertically movable a ram or plunger 21 projecting through the head or upper end 22 of the cylinder and at its upper end carrying a head 23 to the sides of which are secured elongated channel members 24 forming a platform on which may be disposed casting carriers 30 later to be described.

Rigid vertically extending guides 25 are shown as formed with the cylinder 20 and are arranged to one side of the cylinder and in opposing relation as best shown in Figs. 3 and 4. Movable with the platform members 24 are vertically disposed pieces or channels 26 which may be bolted, welded or otherwise secured to the outer sides of said members 24 and these members 26 carry rollers 27 operable in guideways 28 in the opposed faces of the guides 25. With this arrangement the plunger 21 and the parts carried thereby are

prevented from rotating relative to the cylinder 20 and the guide means described further serves to remove lateral strain from the plunger by checking any tendency there may be for the load 5 or the plunger head to tilt in one direction or the other.

In operation the elevator 19 is in its lowermost position as shown in Figs. 2, 3 and 5 and by means of an overhead crane or the like a stack 29 of 10 castings is deposited on the platform members 24 of the elevator. This stack of casting is conveniently handled when the castings are in the U-shaped carriers 30 with hooks 30a at their upper ends and it will be appreciated that a crane 15 or other power means will be required to handle the stack of castings since usually there are ten castings in a stack and the castings weigh in the neighborhood of 400 lbs. each. Suitable chains from the crane may be attached to hooks 30a. 20 When a full stack of castings is on the elevator and the elevator is in its lowermost position the uppermost casting of the stack is in position to be moved substantially horizontally into position in the shear 15. As best shown in Fig. 3, each 25 of the castings 29a of the stack 29 has a so-called gate 31 and the present invention provides means for efficiently handling these heavy castings to cut this gate from them and to stack the castings after the gates have been sheared off. 30 It will be understood that the castings are moved one at a time from the elevator to the shear and that it is always the uppermost casting of the stack that is moved to the shear. In order that the castings may be pushed from the 35 stack into the shear and lie flat while in the shear it is desirable that the uppermost casting be so located that it may be moved horizontally to the shear. It is for this reason that the elevator 19 is employed. Fig. 1 best shows the piping arrangement to the elevator and in this figure 32 40 is a water or oil reservoir preferably located higher than the elevator 19. A pipe 33 from the reservoir 32 is provided with a check valve 34 whereby the liquid may pass the valve only in the 45 direction indicated by the arrow associated therewith. Connected with pipe 33 is a pump 35 the connection being made as by a T-fitting 36 to a short pipe or nipple 37.

The pump unit is shown enlarged in Fig. 11 50 and the pump includes a cylinder 38 within which is a ram or plunger 39 the rear or inner end of which is located within an engine cylinder 40, being connected with a piston 41 therein. The ram passes through stuffing boxes 42 and 43 as 55 shown. Air under pressure or other operating media is supplied from any suitable source (not shown) through a pipe 44 to a four-way valve 45 and this valve through pipes 46 and 47 communicates with the respective ends of the engine 60 cylinder 40. When the valve is positioned as in Fig. 1 steam or air under pressure is supplied to the inner end of the cylinder 40 through the pipe 46 and is exhausted from the outer end of the cylinder through a pipe 47 communicating with 65 an exhaust pipe 48 through the valve 45.

From this it will be clear that when the valve 45 is positioned as in Fig. 1 the piston 41 is forced to the outer end of the cylinder 40 and the ram 39 is drawn to the inner end of the pump cylinder 70 38. This results in oil or water being drawn into the pump 35 from the reservoir 32. Now, when the valve 45 is reversed fluid pressure will be admitted to the outer end of cylinder 40 and the piston and ram will be moved forwardly, the 75 ram acting to expel the oil or water in the pump

cylinder and forcing the oil or water out of such cylinder and through a check valve 49 which permits the oil or water to pass only in the direction indicated by the arrow 50. From valve 49 the oil or water from the pump 35 enters the pipe 51 5 connected as by a T-fitting 52 with a pipe 53 leading to the lower end of the elevator cylinder 20.

In the pipe line 52 beyond the fitting 50 is a gate valve 54 and this valve is closed when the 10 elevator is being raised to prevent the oil or water being pumped back into the reservoir 32 since the pipe 51 is connected with the pipe 33 as by a fitting 55. It will, therefore, be seen that as the pump 35 is operated it draws oil or water 15 from the reservoir 32 and forces such oil or water into the elevator cylinder 20 so as to act on and raise the ram 21 of the elevator. As above suggested it is the uppermost casting of the stack 29 which is moved into the shear 15 and it is 20 desirable that said uppermost casting be so positioned that it may be moved horizontally to the shear. In the present construction it is preferred that the diameter and stroke of the ram 39 of the pump be such that one forward stroke of the 25 pump will serve to raise the elevator platform exactly the thickness of one casting.

With the present construction a casting is moved from the elevator 19 to proper position in the shear 15 is indicated at D, Fig. 3, and after 30 the shear has acted to shear off the gate 31 of the casting the latter is moved onto a receiving table 56 at the rear of the shear 15. A power operated pusher is provided for moving the heavy 35 castings, and this pusher, generally designated 57, is arranged forwardly of the elevator 19 and includes a suitable support 58 on which is mounted a cylinder 59 containing any suitable piston construction, the forward end of the piston rod 60 40 of which carries a cross pin 61 on which is pivotally mounted a pusher shoe or slipper 62 (see Figs. 6 and 7).

The shoe 62 is provided with a heel or shoulder 63 and forwardly of such heel or shoulder the 45 underside of the shoe is curved upwardly as at 64. The head 65a on the piston 60 carrying the cross pin or bar 61 has an upwardly extending bracket or arm 65, the upper end of which is formed into an eye 66 receiving a rod 67 extending 50 above and parallel with the cylinder 59. This rod 67 passes through a tubular guide 68 located at the upper side of the cylinder 69. With this construction it will be apparent that the piston rod 60 and the pusher shoe 62 will be held against any turning movement about the longitudinal 55 axis of the piston rod and relative to the cylinder 59, but that the rod 67 will not interfere with reciprocating movement of the piston rod.

The piston rod 60 is reciprocated by alternately admitting fluid, as air or water, under pressure to the respective ends of the cylinder 59. The fluid 60 under pressure is supplied from any suitable source (not shown) and is distributed by a valve 69 arranged in a pipe 70 communicating with both ends of the cylinder 59. In one position of the 65 valve 69 fluid under pressure is admitted to the rear end of the cylinder and exhausted from the forward end thereof and in the other position of the valve fluid under pressure is admitted to the forward end of the cylinder and exhausted from 70 the rear end thereof. It will, therefore, be apparent that by proper manipulation of the valve 69 the pusher shoe 62 may be moved forwardly or retracted as required. As the pusher shoe is moved forwardly its curved portion 64 rides onto 75

the upper surface of the uppermost casting of the stack on the elevator and its heel or shoulder 63 engages the rear end of such casting with the result that the casting is pushed forwardly.

5 In the operation of the apparatus, assuming that there is a casting on the elevator 19 the valve 69 may be operated to admit fluid under pressure to the rear end of the cylinder 59 and the shoe 62 will be moved forwardly and engage 10 and push forwardly the said casting. Since the elevator is so positioned that the casting may move horizontally to the shear 15 the casting is pushed onto the shear bed 16 into such position that the gate 31 of the casting is at the rear of 15 the shear blade 17 as indicated at D Fig. 3. Valve 69 is then closed so as not to move the casting further and the shear 15 is operated to shear the gate from the casting, and the gate will slide or roll down a chute 71 into a scrap bucket 72 arranged in a pit 73 beneath a removable portion 20 74 of the receiving table 56.

Valve 69 is then again opened to supply fluid under pressure to the rear end of the cylinder 59 and the shoe 62 is further advanced, as into the 25 dotted line position of Fig. 2, to carry the casting from which the gate has been sheared through the shear and onto the table 56. After the shoe 62 is withdrawn to normal position the valve 45 may be operated so as to bring about a raising of 30 the platform of the elevator 19 to locate the next casting of the stack in position to be moved horizontally from the elevator to and through the shear. When all of the castings of a stack have been moved off the elevator the gate valve 54 may 35 be opened and the oil or water forced into the elevator cylinder 20 to raise the elevator will be released and will be forced back into the reservoir 32 owing to the weight of the parts which have been raised by such oil or water. The empty 40 carriers 30 may now be removed from the elevator and carriers with a new supply of castings may be deposited on the elevator.

To the rear of the receiving table 56 and below the surface of such table the apparatus is continued and includes a base part or block 75 having 45 transversely extending slots 76 therein receiving carriers 77 similar to the carriers 30 previously referred to. At each longitudinal edge of the block 75 is a track 78 for a piling car 79. It will be 50 noted that the tracks 78 incline upwardly away from the table 74 so that the normal tendency of the car 79, operable on said tracks, is to gravitate toward the table. Stop plates 80 and 81 connect the rails 78 at their respective ends and serve to 55 prevent the car running off the rails and further serve to brace the rails.

The car 79 comprises lower side members 82 and 83 each of which mounts a pair of wheels 84, and extending upwardly from and reinforcing said side plates 82 and 83 are heavy vertical 60 angles 85 and 86 respectively. The upper parts of the angle plates 85 and 86 are connected by a cross girt 87 located above the carriers 77. An idle cross roll 88 is mounted in roller bearings on 65 the vertical sides of the angle plates 85 and 86, and the top of this roll is on a level with the tops of the rolls of the receiving table 56. From the foregoing, it will now be understood that the normal position of a piling car 79 is that in 70 which it is shown in full lines in Figs. 1, 2, and 9, and since the car includes wheels mounted on the rails 78 it will be apparent that the car may be moved rearwardly of the table 56 to the dotted line positions of the figures mentioned.

75 The pusher 62 at the limit of its forward move-

ment, as shown by the dotted lines in Fig. 2, has pushed a casting C substantially through the shear 15 and onto the receiving table 56 where the casting lies in a horizontal position. Prior 5 to the movement of the casting C into the dotted line position of Fig. 2 a casting B, also shown by dotted lines, had been moved into that position and as the casting C was advanced its forward end engaged the rearward end of the casting 10 B and pushed it along from the position in which casting C is now shown in dotted lines to the position in which the casting B is now shown in dotted lines. Prior to the casting B a casting A also shown by dotted lines in Figs. 2 and 15 9 have been pushed through the shear by the shoe 62 and into the position B. This casting indicated by the dotted lines A is falling onto a stack of castings 89 on the carriers 77. As the casting next following the casting C is pushed 20 through the shear its forward end will engage the rear end of the casting C and push the latter forwardly and the forward end of the casting C being in engagement with the rear end of the casting B will force the latter along.

After the forward end of the casting B leaves 25 the table 56 it moves onto the top of the idle cross roll 88 and engages the cross girt 87 as best shown in Fig. 9. As the pushing movement continues the casting B forces the piling car 79 rearwardly along its tracks 78 as suggested by 30 the dotted line and the idle cross roll 88 continues to support the forward end of the casting which is being pushed off the table 56 while the rear portion of said casting rests on the table. The car continues to be forced rearwardly until the 35 rear end of the most advanced casting moves off the table 56 when such end falls and the forward end of the casting is released by or falls off the idle cross roll 88 so that the casting drops onto the pile 89 in the carriers 77. At the rear end 40 of the table 56 is a vertically disposed channel member 90 forming a support for said end of the table and also acting to guide the rear ends of the castings as the latter falls onto the stack 89.

When a casting falls onto the stack 89 the car 45 79 is released and may gravitate forwardly to normal position. However, if desired the car may be manually or otherwise pushed to normal position and, if it is desired, suitable counterweights may be applied to the car to automatically return it to this position. However, it will be understood that as the forward end of each casting leaves the table 56 the said end of the casting is received and supported by the idle 50 cross roll 88 and abuts the girt 87 so that the forward end of the casting is supported until its rear end is pushed off the table, it being understood that the said forward end of the casting abutting against the girt 87 pushes the car 79 rearwardly along its rails 78. When the carriers 77 are loaded the car 79 may be pushed rearwardly or held in its rearmost position so as to permit of the use of an overhead crane or the like in the removal of the carriers and their load. 55 Similarly when the scrap bucket 72 is filled the portion 74 of the table 56 may be removed so as to permit of the use of a crane or the like in the removal of the scrap bucket. From the foregoing description taken in connection with 60 the drawings it will be seen that with the present apparatus heavy castings may efficiently and with a minimum of manual effort be passed through a shear to have their so-called gates sheared or cropped off. By means of a crane 65 70

or the like a stack of castings are placed on the platform of the elevator 19 with the uppermost casting of the stack in position to be moved horizontally to the shear 15. Thereafter, valve 5 69 is manipulated to have the pusher 57 move the casting to the shear and the shear is operated to remove the gate from the casting after which the casting is pushed onto the table 56. Control valve 45 for the elevator 19 is then 10 operated to have the engine operate the pump 35 one stroke whereby to raise the elevator platform a distance equal to the thickness of one casting. When valve 45 is thus operated valve 54 must be closed.

15 In this way the castings of a stack are successively moved to and through the shear and when all the castings of a stack have been moved from the elevator the valve 54 is opened to permit the liquid to return to the reservoir 32. After 20 the forward end of the casting moves off the table 56 said end abuts the girt 87 and is supported by the idle cross roll 88, and as the movement pushing said casting off the table continues the said casting pushes the piling car 25 rearwardly away from the table until the rear end of the casting moves off the table when the casting falls onto the stack 89 between the rails 78 and in position to be straddled by the car when the car returns or is returned to normal 30 position.

Having thus set forth the nature of my invention, what I claim is:

1. In combination, a table, means for moving a casting over the table, means at the rear of the 35 table adapted to receive the forward end of a casting after said end leaves the table and support said end until the rear end of the casting leaves the table, said latter means being movable rearwardly away from the table with the 40 forward end of the casting as the casting is being moved off the table, an abutment on said means arranged to be engaged by the end of the casting to shift said means, and said means adapted to release the forward end of the casting and 45 permit the latter to fall when its rear end leaves the table.

2. In combination, a table, means for moving a casting over said table, means at the rear of the table adapted to receive the forward end of a 50 casting after said end leaves the table and support said end until the rear end of the casting leaves the table, said latter means being movable rearwardly away from the table with the forward end of the casting as the casting is being 55 moved off the table, an abutment on said means to be engaged by the end of the casting to shift said means, said means adapted to release the forward end of the casting and permit the latter to fall when its rear end leaves the table, and 60 means to automatically return said latter means to its original position to receive another casting.

3. In combination, a table, means for moving a casting over the table, a piling car at the rear 65 of the table, tracks along which said car is movable toward and from the table, said car including means to receive and support the forward end of a casting after said end leaves the table and support said end until the rear end of the casting 70 leaves the table, said car being movable along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, an abutment on the car to be engaged by the end of the casting to shift the car, and said 75 car adapted to release the forward end of the

casting and permit the latter to fall as its rear end moves off the table.

4. In combination, a table, means for moving a casting over the table, a piling car at the rear of the table, tracks along which said car is movable toward and from the table, said car including means to receive and support the forward end of a casting after said end leaves the table and support said end until the rear end of the casting leaves the table, said car being movable along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, said car adapted to release the forward end of the casting and permit the latter to drop as the rear end thereof moves off the table, and said tracks being inclined whereby on the dropping of a casting the car automatically rolls back to normal position ready to receive the forward end of the next casting moved over the table. 20

5. In combination, a table, means to push a casting onto and across said table, a piling car at the rear of the table, tracks along which said car is movable toward and from the table, said car including means to receive and support the forward end of a casting after said end leaves the table and support said end until the rear end of the casting leaves the table, said car being movable along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, an abutment on said car to be engaged by the end of the casting to shift the car, said car adapted to release the forward end of the casting and permit the latter to fall as the rear end thereof moves off the table, and means to automatically return the car to its original position to receive another casting. 35

6. In combination, a table, means to push a casting onto and across said table, a piling car at the rear of the table, tracks along which said car is movable toward and from the table, a roller on said car to support the forward end of a casting after said end leaves the table and support said end until the rear end of the casting leaves the table, said car being movable along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, an abutment on the car to be engaged by the casting to shift the car, and said roller adapted to release the forward end of the casting and permit the latter to fall as the rear end thereof moves off the table. 45

7. In combination, a table, means to push a casting across said table, a casting carrier at the rear of and below the surface of said table, a piling car at the rear of said table, tracks along which said car is movable toward and from the table, said car including a part above said carrier and substantially flush with the surface of the table to receive and support the forward end of a casting after said end leaves the table and support said forward end until the rear end of the casting leaves the table, said car being movable along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, an abutment on the car to be engaged by the end of the casting to shift the car, and said part adapted to release the forward end of the casting and permit the latter to drop onto said casting carrier as the rear end of the casting moves off the table. 60

8. In combination, a table, means to push a casting onto and across said table, a casting carrier at the rear of and below the surface of said table, tracks arranged one at each side of 75

said carrier, a piling car on said tracks and straddling said carrier and movable on the tracks between a position over the carrier and a position rearwardly thereof, said car including a part 5 above said carrier and substantially flush with the surface of the table to receive and support the forward end of a casting after said end leaves the table and support said forward end until the rear end of the casting leaves the table, 10 said car being movable along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, an abutment on the car to be engaged by the end of the casting to shift the car, and 15 said part adapted to release the forward end of the casting and permit the latter to drop on to said casting carrier as the rear end of the casting moves off the table.

9. In combination, a table, means to push a 20 casting across said table, a casting carrier at the rear of and below the surface of said table, a piling car at the rear of said table, tracks along which said car is movable toward and from the table, said car including a roller above said 25 carrier and substantially flush with the surface of the table to receive and support the forward end of a casting after said end leaves the table and support said forward end until the rear end of the casting leaves the table, said car movable 30 along its tracks away from the table with the forward end of the casting as the casting is being moved off the table, and said roller adapted to release the forward end of the casting and permit the latter to drop on to said casting car-

rier as the rear end of the casting moves off the table.

10. In combination, a table, means to push a casting across said table, a casting carrier at the rear of and below the surface of said table, a 5 piling car at the rear of said table, tracks along which said car is movable toward and from the table, said car including a part above said carrier and substantially flush with the surface of the table to receive and support the forward end 10 of a casting after said end leaves the table and support said forward end until the rear end of the casting leaves the table, a part on the car to be abutted by the forward end of the casting whereby the latter pushes the car away from 15 the support as the casting is being moved off the table, and said first part adapted to release the forward end of the casting and permit the latter to drop onto said carrier as the rear end of the casting moves off the table. 20

11. In combination, a table, means to push a casting across said table, means at the rear of the table to support the forward end of the casting after it leaves the table, said support being 25 movable away from the table with the forward end of the casting until the rear end of the casting leaves the table and adapted to then release the casting, an abutment on said support to be engaged by the end of the casting to shift the support, and means whereby the support is 30 automatically moved back to its original position to receive the next casting.

JAMES R. COE.