BUCKET ATTACHMENT FOR INGOT STRIPPERS AND THE LIKE

Ervin A. Drill, Duluth, Minn.

Application November 15, 1951, Serial No. 255,469

6 Claims. (Cl. 22--95)

This invention relates to a bucket attachment for ingot strippers and the like.

Strippers with which the bucket of the present invention can be used have a pair of tong arms for pushing trunnions of an ingot mold or the like and thus lifting the mold and an independently movable ram for pushing down on the ingot or the like and thus forcing the mold and ingot apart. Such a stripper is shown, for example, in George Patent No. 1,760,054, which issued May 27, 1930, although it is apparent that the bucket of the present invention is not restricted to use with the particular stripper this patent shows, but can be used with any stripper of the same general construction.

An object of the present invention is to provide a bucket attachment which can be installed on strippers and operated by the ram and tong arms thereof for handling loose material or other loads not readily handled by the stripper.

Another object of the invention is to provide a bucket attachment which includes a pair of hangers adapted to be held by stripper tongs, a pair of bucket halves hinged to said hangers and a mechanism for opening and closing said bucket halves adapted to be operated by the stripper ram.

A further object of the invention is to provide a bucket attachment which is adapted to be installed on a stripper or released therefrom by simply operating the tongs and ram of the stripper in the usual fashion, and which can be attached to a standard ingot stripper with only a minor modification in the ram head, namely the inclusion of a pair of dog engaging notches, which in no way interfere with normal operation of the stripper.

These and other objects will become more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a top plan view of a bucket attachment which embodies features of the present invention;

Figure 2 is a side elevational view of the attachment with the bucket halves closed;

Figure 3 is a side elevational view of the attachment resting on a stand and with the bucket halves open; and

Figures 4 and 5 are vertical sectional views illustrating the means for fastening the attachment to a stripper.

Figures 4 and 5 show part of an ingot stripper which includes a pair of slotted tong arms 10 and 12 and a ram 13. The tongs normally are used for gripping the trunnions of an ingot mold and the ram for pushing down on an ingot therein and thus separating the mold from the ingot. The stripper includes any standard or desired mechanism, not shown, for spreading and closing the tongs and for raising and lowering the ram. The stripper is supported in the usual fashion from an overhead crane.

The bucket attachment of the present invention comprises a pair of laterally spaced hangers 14 and 15, each of which has a lug 16 for engagement by tong arms 10 and 12. A pair of bucket halves 17 and 18 are hinged to said hangers on four pins 19. Each bucket half is formed of a pair of flat side plates, whose outline is approximately a sector of a circle, and a curved bottom plate fixed to the arcuate edge of its side plates. The inner edges of the bucket halves are adapted to mate, so that said halves, when brought together, form a receptacle capable of holding a load of loose material.

The bucket attachment further comprises a vertically movable head 20 which contains an upwardly facing socket 21 adapted to receive the lower end of ram 13. A pair of dogs 22 and 23 are pivoted to the head 20 and have inner portions which normally extend into the socket 21 and outer portions which extend outside the head on the same sides of the attachment as the lugs 16. The lower end of ram 13 carries a foot 24, which contains opposed notches 25 and 26 adapted to be engaged by the inner portions of dogs 22 and 23. The inclusion of these notches is the only modification which is made to the stripper to enable the bucket to be used therewith, and the notches do not interfere with normal use of the stripper. The dogs 22 and 23 are constructed to gravitate to the position in which their inner portions project into the socket 21. The upper faces of the inner portions of the dogs have cam surfaces 27 so that the dogs swing out of the socket 21 when ram 13 engages the cam surfaces as it is lowered into the socket. Thereafter the dogs gravitate back to the position where their inner portions engage the notches. The head 20 can be lowered to a position between the hangers 14 and 15 or raised to a position thereabove.

The head 20 has a pair of opposed pivot ears 28 and 29. Bucket half 17 has pivot ears 30 along the upper edge of its bottom member and bucket half 18 has similar pivot ears 31. A link 32, preferably as shown in Figure 1, extends between ears 28 and 30 and is connected thereto by pins 33 and 34 respectively. Similarly a link 35 and pins 36 and 37 extend between and connect ears 29 and 31.

When the attachment is not in use, it is conveniently supported in open position on a stand 38. The top of this stand has downwardly sloping surfaces 39 and 40 against which the mating edges of the bucket halves rest. In this position the head 20 is spaced above the hangers 14 and 15.

In operation, assume first that the bucket attachment is resting on its stand 38 and it is desired to install it on the stripper. First the stripper mechanism is adjusted to spread the tong arms 10 and 12 and raise the ram 13 with respect to the tongs. Next the overhead crane, not shown, lowers the stripper over the bucket attachment until the ram foot 24 enters socket 21 in the head 20, whereupon dogs 22 and 23 engage notches 25 and 26 in the ram foot. Finally the tongs are closed and engage lugs 16 of the hangers 14 and 15. Engagement of these tongs with the hangers supports the attachment, and movement of the ram down or up with respect to the tongs lowers or raises the head 20 and thus, acting through links 32 and 35, closes or opens the bucket halves.

Operated in this fashion, the attachment can be used for picking up and moving any suitable load.

When it is desired to release the bucket attachment and again deposit it on stand 38, the ram is raised and the head 20 and open the bucket halves, which then are placed on the stand. Next the tongs are spread and raised above the hangers 14 and 15 and then closed to a somewhat closer spacing than previously. The tongs are raised farther and engage the outer portions of dogs 22 and 23 and swing these dogs out of engagement with notches 25 and 26. Next the ram is raised clear of socket 21 impeded by the dogs. Finally the tongs again are spread until they clear the dogs and the stripper moved away.

From the foregoing description it is seen that the bucket
attachment of the present invention is of simple construction and very readily installed on or released from a standard ingot stripper. One purpose for which I have found this attachment particularly useful is for transporting coke breeze from railroad cars to soaking pits for making bottom in the latter. The stripper which is available around the pits thus can be used for this additional purpose, and the need for manual handling or other special equipment is eliminated. While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

1. A bucket attachment for strippers and the like comprising a pair of hangers, a pair of bucket halves hinged to said hangers and having inner edges adapted to mate so that said halves when brought together form a receptacle, a head having an upwardly facing socket, a pair of dogs pivoted to said head and adapted to project into said socket, and links pivoted to opposite sides of said head and to the outer edges of said bucket halves, whereby movement of said head with respect to said hangers opens and closes said bucket halves.

2. A bucket attachment for strippers and the like, which have a pair of tong arms and a vertically movable ram, comprising a pair of hangers adapted to be engaged with the tong arms for carrying the attachment, a pair of bucket halves hinged to said hangers and having inner edges adapted to mate so that said halves when brought together form a receptacle, a head adapted to receive the lower end of the ram, pivoted means in said head adapted to fix the head to the ram and being releasable from the ram on actuation by the tong arms, and links pivoted to opposite sides of said head and to the outer edges of said bucket halves, whereby vertical movement of said head with respect to said hangers opens and closes said bucket halves.

3. A bucket attachment for strippers and the like, which have a pair of tong arms and a vertically movable ram, comprising a pair of spaced apart hangers adapted to be engaged with the tong arms for carrying the attachment, a pair of bucket halves hinged to said hangers and having inner edges adapted to mate so that said halves when brought together form a receptacle, a vertically movable head having an upwardly facing socket adapted to receive the lower end of the ram, a pair of dogs pivoted to said head and having inner portions normally projecting into said socket for releasably fixing the ram to said head and outer portions outside the head adapted to be engaged by the tong arms for releasing said dogs from the ram, and links pivoted to opposite sides of said head and to the outer edges of said bucket halves, whereby vertical movement of said head with respect to said hangers opens and closes said bucket halves.

5. The combination with a stripper which includes a pair of tong arms and a ram movable vertically with respect thereto and having opposed notches adjacent its lower end, of a bucket attachment comprising a pair of spaced apart hangers engaged with said tongs, a pair of bucket halves hinged to said hangers and having inner edges adapted to mate so that said halves when brought together form a receptacle, a vertically movable head having an upwardly facing socket receiving the lower end of said ram, a pair of dogs pivoted to said head and engaging said notches and thus releasably fixing said head to said ram, and links pivoted to opposite sides of said head and to the outer edges of said bucket halves, whereby vertical movement of said ram with respect to said tong arms opens and closes said bucket halves.

6. The combination with a stripper which includes a pair of tong arms and a ram movable vertically with respect thereto and having opposed notches adjacent its lower end, of a bucket attachment comprising a pair of spaced apart hangers engaged with said tongs, a pair of bucket halves hinged to said hangers and having inner edges adapted to mate so that said halves when brought together form a receptacle, a vertically movable head having an upwardly facing socket receiving the lower end of said ram, a pair of dogs pivoted to said head and having inner portions engaging said notches and thus releasably fixing said head to said ram and outer portions outside the head adapted to be engaged by said tong arms for releasing said dogs from said notches, and links pivoted to opposite sides of said head and to the outer edges of said bucket halves, whereby vertical movement of said ram with respect to said tong arms opens and closes said bucket halves.

References Cited in the file of this patent

UNITED STATES PATENTS

247,829 Johnson ------------- Oct. 4, 1881
986,761 Roscoe -------------- Mar. 14, 1911
1,309,846 Fotheringham ------ July 15, 1919
1,398,844 Danforth --------- Nov. 29, 1921
1,415,720 Shore -------------- May 9, 1922
1,760,054 George -------------- May 27, 1930
2,148,625 Joliet -------------- Feb. 28, 1939
2,188,672 Atkinson ---------- Jan. 30, 1940

FOREIGN PATENTS

422,823 France -------------- Jan. 30, 1911
46,985 Sweden --------------- Oct. 25, 1918