

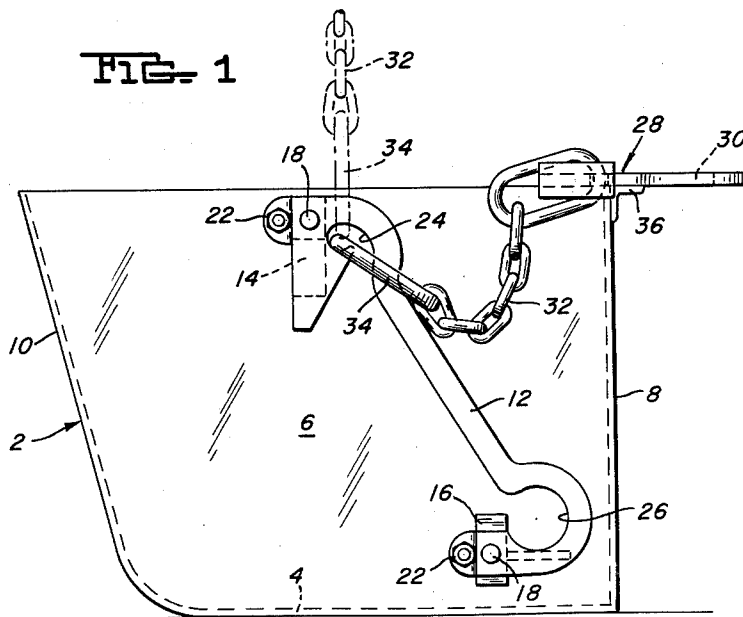
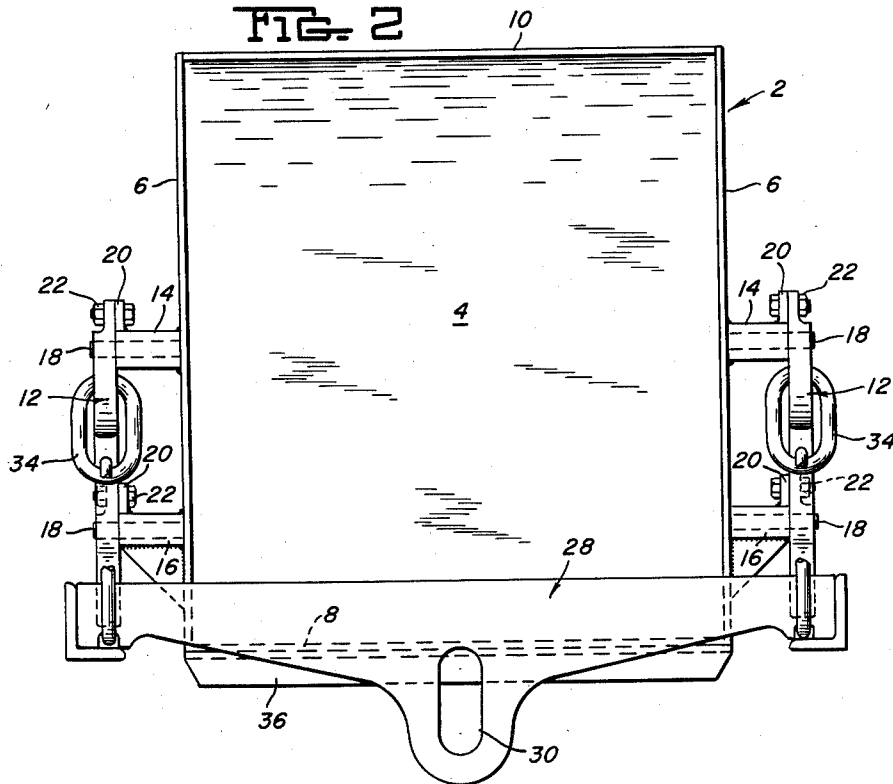
Aug. 13, 1963

N. R. HENNE
SELF-DUMPING BOX

3,100,666

Filed Sept. 27, 1962

2 Sheets-Sheet 1



INVENTOR
NORMAN R. HENNE
By *Donald L. Dalton*
Attorney

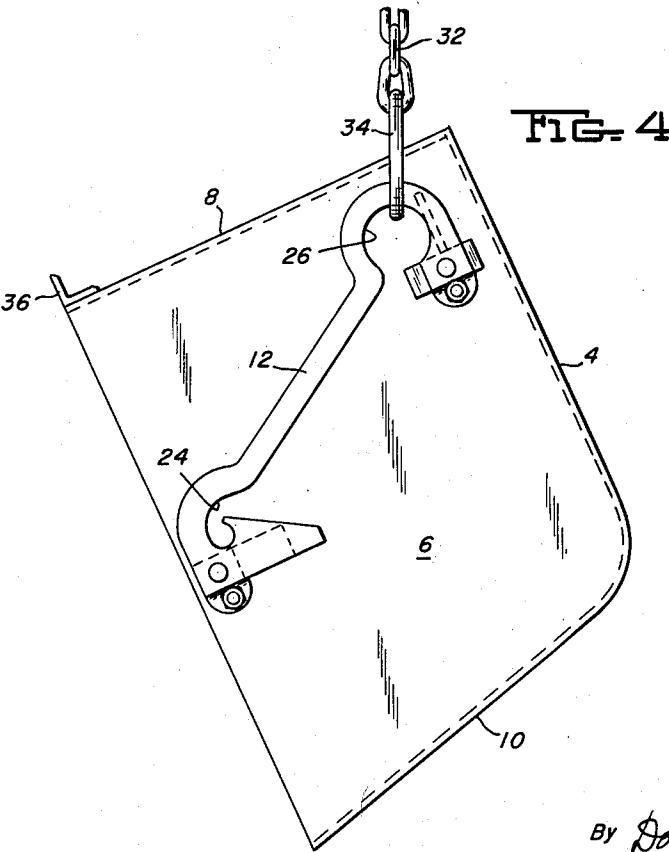
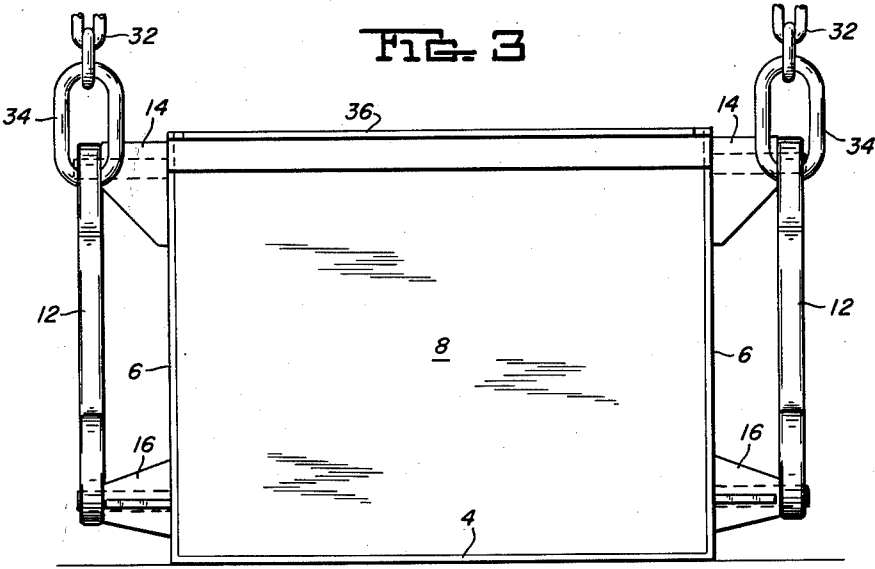
Aug. 13, 1963

N. R. HENNE
SELF-DUMPING BOX

3,100,666

Filed Sept. 27, 1962

2 Sheets-Sheet 2



INVENTOR
NORMAN R. HENNE
By *Donald H. Dalton*
Attorney

1

3,100,666

SELF-DUMPING BOX

Norman R. Henne, Mount Oliver Borough, Pa., assignor
to United States Steel Corporation, a corporation of
New Jersey

Filed Sept. 27, 1962, Ser. No. 226,550
3 Claims. (Cl. 294-73)

The present invention relates generally to apparatus for handling material and more particularly to an improved box or bucket which can be carried by an overhead crane and dumped through manipulation of the crane hook by the crane operator.

Although not restricted thereto, the self-dumping box of my invention is especially suitable for use as a chip box in a machine shop and in that use it will be hereinafter described.

In a typical industrial machine shop, metal chips created as a result of machining operations are periodically removed from the machines in the shop and deposited in a centrally located large chip box. Prior to my invention, when the box was filled it was attached to the hook of an overhead crane by means of a cable or chain sling secured to eyes at the top of two opposite sides of the box. The filled chip box was then carried by the crane to a railroad gondola car where it was lowered into the car until it rested on the car floor or on the pile of chips previously dumped into the car. When the loaded box came to rest in the car, the cable or chain sling was detached from the eyes at the top of the sides of the box and inserted in eyes on one side of the box which were located adjacent the box bottom to effect a lower hold. Then, when the crane lifted the sling, the box rotated 180 degrees about the lower hold as it was raised and dumped its contents. After the box had been dumped it was lowered to rest again and the sling was detached from the lower hold and re-applied to the eyes at the upper edges of the box so it would be carried back to the loading area by the crane. When the box was returned to rest at the loading area, the sling was again removed from the box.

Thus, the dumping operation not only required use of the crane for an excessive period of time each time the box had to be emptied but also required the services of a floorman or hooker since the sling had to be attached and detached manually. The dumping operation was also a hazardous one inasmuch as it exposed the floorman to injury from the sharp chips in the gondola car while rearranging the sling on the box in the car.

It is, accordingly, the primary object of my invention to provide a self-dumping box which is completely manipulatable by an overhead lift hoist without the assistance of a floorman.

It is another object of my invention to provide a self-dumping box of the character described having a flexible bail permanently attached thereto.

As a corollary to the above object it is a further object of my invention to provide a self-dumping box of the character described having a flexible bail attached thereto which can be easily shifted to an out-of-the-way position so as not to interfere with loading of the box.

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

FIGURE 1 is a side elevational view showing the bail of the box of the invention in inoperative resting position in solid lines and the lower portion of the bail in chain lines in position for carrying the box in upright position;

FIGURE 2 is a plan view with a portion of the bail removed for clarity;

FIGURE 3 is an end elevational view showing the

2

lower portion of the bail in position for carrying the box in upright position; and

FIGURE 4 is a side elevational view showing the box of the invention lifted in dumping position.

Referring more particularly to the drawings reference character 2 designates, generally, the box of the invention which is substantially rectangular in shape and has a flat bottom 4, parallel vertical side walls 6, a vertical end wall 8, an inclined end wall 10 and an open top.

As best shown in FIGURES 2 and 4, a diagonally disposed lift bar 12 is rigidly mounted on the outer surface of each of the side walls 6 in spaced apart relation thereto by means of upper and lower spacer blocks 14 and 16, respectively. The upper spacer blocks 14 are welded to the side walls subjacent the upper edges thereof at a point approximately at the center of the upper edge of each side wall. The lower spacer blocks 16 are welded to their respective side walls adjacent the bottom edge of the vertical end wall 8. The lift bars 12 are mounted on studs 18 which project from the spacer blocks, and are secured at their ends to ears 20 of the spacer blocks by nut and bolt means 22. Each of the lift bars 12 is bowed upwardly at its ends to form upper and lower recesses 24 and 26, respectively, for a purpose which will become apparent.

The bail of the box of the invention includes a spreader beam 28 constituting a common hoisting means having an elongated hook-receiving slot 30 intermediate its ends. Chains 32 are attached to and depend from each end of the spreader beam. The free end of each chain 32 is connected with one of the lift bars 12 by means of a ring 34 which is circumferentially mounted on its respective lift bar for free sliding movement therealong. When the box 2 is being filled the spreader beam may be conveniently laid horizontally along a ledge 36 formed along the upper edge of the vertical end wall 8. When the spreader beam is in this inoperative position on the ledge 36, the portion thereof having the hook-receiving slot 30 therein projects outwardly of the ledge 36 so that the spreader beam can be readily picked up by the hook of an overhead crane.

Thus, the bail of the box of my invention is flexibly but permanently attached to the box so that it can be easily shifted to an out-of-the-way position on one end of the box when the box is being filled and does not require manually attaching to or detaching from the box, as will become apparent hereinafter.

In operation, after the box has been filled and is to be emptied, an overhead crane (not shown) is positioned over the box and the crane hook (not shown) is lowered to engage the spreader beam through the hook-receiving slot 30 thereof. The crane hook is then moved slightly toward the left end of the box 2, as viewed in FIGURE 1, and lifted to raise the spreader beam and move rings 34 upwardly along the lift bars 12 so that the rings are engaged in the upper recesses 24. Then continued lifting of the spreader beam by the crane hook will cause the box to be suspended in an upright position so that it can be carried to a gondola car (not shown) for dumping. At the gondola car the box is lowered to the floor of the car if the car is empty or to the top of the load of the car if the car is partially loaded, and as the chains 32 slacken, the crane hook is moved slightly toward the right end wall of the box, as viewed in FIGURE 1, which permits the rings 34 to disengage from the upper recesses 24 and fall along the bars 12 to the lower recesses 26. When the rings 34 are engaged in the lower recesses the spreader beam is again raised to lift the box. As the box is lifted with the rings 34 engaged in lower recesses 26 it is rotated approximately 180 degrees about its horizontal transverse axis, as shown in FIGURE 4, and it is

3

emptied of its contents. Then the box is again lowered to rest in an upright position and the crane hook is moved slightly toward the left end of the box and raised causing rings 34 to disengage from the lower recesses 26, travel upwardly along the lift bars 12, and be engaged in the upper recesses 24. The box is then carried back to the loading area by the crane and lowered to the floor. After the box has been lowered to the floor, the crane operator lowers the crane hook to lower the spreader beam 28 to rest on the ledge 36 on the upper edge of the vertical end wall 8, as shown in solid lines in FIGURES 1 and 2. After the spreader beam has been placed on the ledge, the crane hook is lowered to disengage it from the hook-receiving slot of the spreader beam and the crane is then free to perform its other duties.

Although I have shown chains 32 being used to connect rings 34 to the spreader beam 28 it will be understood that flexible cables or the like can be used in place of the chains, if desired.

It will be understood that numerous modifications and variations may be made from the illustrative embodiment of the invention, described above and shown in the accompanying drawings, without departing from the concepts and novel principles of the invention.

I claim:

1. Material handling apparatus comprising a box having vertical side walls and end walls, a horizontal bottom, and an open top, a lift bar affixed diagonally on the outer surface of each of said side walls in spaced relation thereto, each of said bars having an upper end disposed subjacent the top longitudinal edge of its respective side wall intermediate the ends thereof and a lower end disposed on its respective side wall adjacent the lower end of one of said end walls, each of said lift bars having a recess therein adjacent its upper end and a recess therein adjacent its lower end, elongated flexible suspension means loosely attached by one end to each of said bars, said one end of each of said suspension means being adapted to be selectively engaged in the recesses of said bars, and common hoisting means attached to the other ends of said suspension means.

4

2. Material handling apparatus as defined by claim 1 characterized by said one end of each of said elongated flexible suspension means including a ring member circumferentially mounted on its respective bar for free sliding movement therealong.

3. Material handling apparatus comprising a box having vertical side walls and end walls, a horizontal bottom and an open top, a lift bar affixed to the outer surface of each side wall in spaced relation thereto, each of said lift bars being substantially identically disposed diagonally relative to the side wall to which it is affixed and extending from a point subjacent the upper edge of the side wall intermediate said end walls to a point on the bottom portion of the side wall adjacent one of said end walls, each of said bars being bowed upwardly adjacent each end thereof, said bowed portions forming recesses adjacent the upper and lower ends, respectively, of each of said bars, a ring member circumferentially mounted on each of said bars for free sliding movement therealong, each of said rings being adapted to be selectively engaged in said recesses, a rigid horizontally disposed spreader bar adapted to be suspended from and raised and lowered by hoist means above said bucket, flexible suspension means depending from each end of said spreader beam, said flexible suspension means being attached one to each of said rings whereby said bucket is raised in upright position when said spreader beam is raised while said rings are engaged in the upper end recesses of said bars and said bucket is tilted approximately 180 degrees about its transverse horizontal axis when said spreader beam is raised while said rings are engaged in the lower end recesses of said bars.

References Cited in the file of this patent

UNITED STATES PATENTS

689,993	Smith	Dec. 31, 1901
902,223	Focht	Oct. 27, 1908
2,796,283	Grazier	June 18, 1957