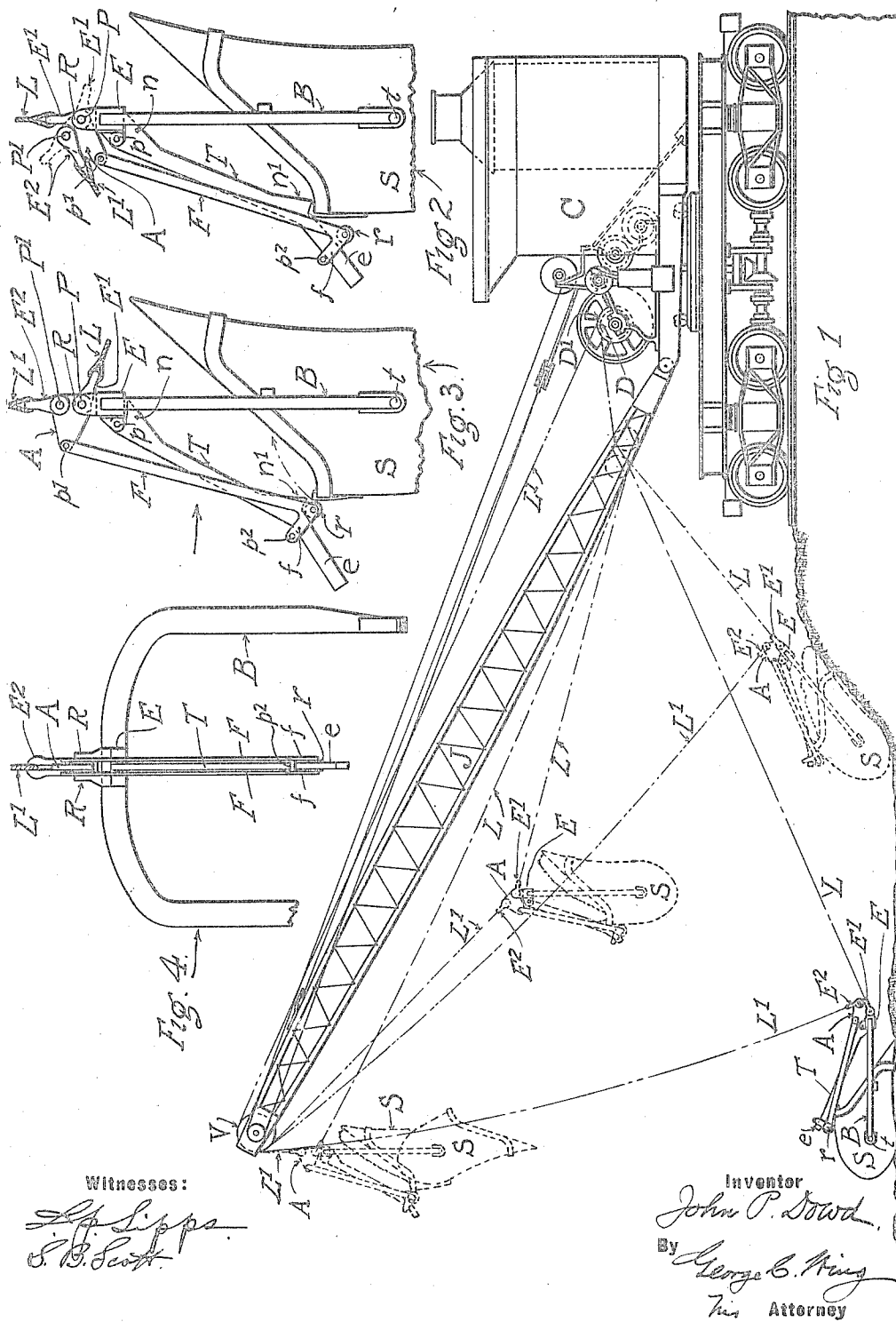


J. P. DOWD.
 MEANS FOR OPERATING SHOVEL BUCKETS AND SIMILAR RECEPTACLES.
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Witnesses:

J. P. Lippa
E. B. Scott

Inventor

John P. Dowd

By *George B. King*

His Attorney

UNITED STATES PATENT OFFICE.

JOHN P. DOWD, OF CLEVELAND, OHIO, ASSIGNOR TO THE BROWN HOISTING MACHINERY COMPANY, OF CLEVELAND, OHIO.

MEANS FOR OPERATING SHOVEL-BUCKETS AND SIMILAR RECEPTACLES.

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To all whom it may concern:

Be it known that I, JOHN P. DOWD, a citizen of the United States, residing at the city of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Means for Operating Shovel-Buckets and Similar Receptacles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of the specifications herewith, wherein similar parts are designated by similar letters in each case.

The device in question, from its nature, is readier of application to and likely to be more generally used in connection with the class of scoops or shovel-buckets, handled by boom-cranes, wherein the buckets are pivotally suspended within the bails at points on their sides that are forward of the center of gravity of the bucket when empty, but behind the same when loaded, so that, when free to move, the bucket will automatically discharge its load and immediately right itself to the proper position with reference to its bail to take in a new load. It follows, of course, that tail-latches or corresponding devices are usual and necessary in the use of buckets of this kind to preserve a fixed relation between the bucket and its bail while the load is being scooped, and to prevent a premature discharge of the same as it is being carried around by the crane to the dumping point. It consequently becomes highly desirable to so contrive and arrange the tail-latch to be used in this connection that when the dumping point is reached, the bucket itself, without need of any special movements or manipulation to this end, will immediately become unlocked and allowed to turn over and let out its load.

Having in consideration that revolving shovel-buckets of the above design, when used in connection with boom-cranes, or like excavating implements, are invariably controlled in their principal movements by the oppositely related hoist, and drag or haul ropes of the crane that engage the bucket at or near the bail, I take advantage of this operative feature and provide a form of tail-latch in the connection that will become unlocked by simply the normal tension of said ropes whenever, in the course of the crane's ordinary movements in handling the bucket, a certain anticipated angular rela-

tion between said ropes and the direction of their pull, is reached.

In the drawings, Figure 1 is a side elevation of a locomotive crane with its bucket, in full lines, in position beneath the head of the boom to be hauled in for its load, and, in dotted lines, the several positions the bucket will assume from the time it has gained a load until the same is dumped. Fig. 2 is the upper part of such a bucket with the means I propose for effecting the latching and unlatching thereof, the full lines showing parts in the same relation to the bucket as in Fig. 1, and, the dotted lines at the top, the position certain parts will assume when the bucket is upright for carrying. Fig. 3 is a like view when the bucket is free to dump, and Fig. 4 is a view of the parts shown in Fig. 3, in the direction of the arrow, one side being broken away.

C is a locomotive-crane and S the shovel-bucket to be operated thereby; L is the usual haul rope connected to the bail and extending directly therefrom to a controlling drum D on the crane, L¹ is the hoisting rope immediately connected to said bail through a level-member A. L¹ extends upwardly to and over a sheave V in the head of the boom, and thence backwardly to a similar controlling drum D¹.

B is the bail. It pivotally engages the sides of the bucket at points *t* thereon that are forward of the bucket's center of gravity when empty and behind the same when filled. Centrally of the bail at the top, is a clevis E, having upwardly projecting ears R R, at the sides thereof between and to which a second clevis E¹ is pivotally fastened, wrist-upward, by means of the pin P. The outer end of the haul-rope L is fastened to said clevis E¹. Between and to the jaws of the clevis E¹ a bell-crank lever, preferably in the form of a triangular plate A, is pivotally connected, by being threaded and fulcrumed upon the pin P, through one corner or angle of the same. This plate, and its remaining angles, project backwardly with respect to the bail and the front or shovel portion of the bucket, when the latter is in its normal or latched position. At the uppermost angle of said plate, a clevis E² (to which is fastened the hoist rope L¹) is pivotally connected to the same by means of a pin P¹. The tail-latch proper consists of a bar T whose upper end is pivotally attached

midway of and to the rear of the bail by a pin p , the under side of this bar near the point of this attachment being preferably given an inner projection n , to limit or stop any tendency of the bar to swing in that direction when free of its locking engagement with the bucket. On the same side of the bar, at a suitable point to overhang and engage the rear upper edge of the bucket when the latter is in an upright position with relation to the bail, is a second projection or nose n^1 . The lower end e , of the bar T, extends downwardly and outwardly from the shoulder or nose n^1 , at an angle with the upper portion of said bar. At the third and rearmost angle of the plate A, on each side thereof, and pivotally attached thereto at their upper ends by a pin p^1 , are parallel bars F F. These bars embrace the latch-bar T, and extend downwardly to a point below the inclined portion e , of the same, where they are joined together, in a trapezoidal frame, by a cross-roller indicated by r . At this point, in order to provide against any undue forward swing of the same, the bars are given sharp upturns f at each side to above the bar T, where they are connected together by a cross-pin p^2 .

Having thus described a concrete application and embodiment of my invention, its mode of operation will be readily apparent to one skilled in the art to which it relates. The crane which is to operate the bucket S being so stationed that its boom-head is approximately over the material through which the scoop is to be made, and the bucket suspended beneath said head, the bucket may be lowered into an operative position by simply paying out the hoisting rope L^1 . In this position the bucket will, of course, be front-down with the latch-bar T locked against the same. The haul-rope L is now wound up upon its drum D and the hoisting rope L^1 correspondingly unwound, until the bucket has been dragged inwardly, beneath the boom J, and its fill made. The hoist-rope L^1 is then wound in and the drum D, controlling the rope L, at the same time braked, until the resultant of the two opposite angular pulls or forces, exerted on said bucket by said ropes, raises the bucket from its prone position on the material bed to an upright position (as in Figs. 1 and 2) beneath and nearer the boom J.

It is manifest that by maintaining the boom J at some normal angle to the horizon during the above operation as indicated in the drawings, the hoist will be without appreciable movement of the plate A around its fulcrum at P, or consequent actuation of the unlocking lever or part F, and that when the bucket has thus been raised to an upright position the direction of the pull of the two ropes L and L^1 will be in substantial opposition. While in this position the boom

may be swung around to the dumping place, the tail-latch unlocked and the load discharged. After being once hoisted to a swinging position beneath the boom, the tail-latch may be unlocked and the dump effected at any time, without regard to the bucket's distance from the boom-head, by simply abruptly raising the boom, or this may be brought about by pulling the bucket forwardly and upwardly to the boom-head. In each case, the direction of the pull of the rope L^1 will be changed by the respective movements from one in substantial alinement with the pull of the haul-rope L, to one at an angle therewith, which will in consequence cause the plate A to oscillate upwardly around its fulcrum and pivot P, and thereby to raise the bars F around their pivot p^1 . The roller r will thereupon be drawn up along and under the lower edge of the inclined parts e , until it lifts the nose n^1 , of the latch-bar T, out of engagement with the bucket, when the latter will automatically revolve about its trunnions or pivot points t , and the dump be made.

While in the foregoing description I show certain specific forms for parts necessary to my invention I do not intend, in the broader sense, to limit the invention to such precise form. The plate A may take the technical form of a bell-crank lever, for instance, instead of the triangular plate shown, and the relative location of the several pivotal points thereof may be varied. So too, the unlocking member, illustrated by the parallel bars F F, may be made in a single piece or bar, without departing from the idea or invention I would generally comprehend herein.

What I do claim and wish to protect by Letters-Patent is:—

1. In a hoisting apparatus having oppositely related hoisting and hauling ropes, the combination, with a bucket pivotally suspended within a bail at points on the sides thereof that are forward of the center of gravity of the bucket when empty, and behind said center when loaded, of a latch-bar pivotally connected to said bail at its upper end, and projecting outwardly and downwardly at an angle at the other end, said bar being of suitable form and dimensions to overhang and engage said bucket when the latter is in an upright position with respect to said bail; a bell-crank lever, fulcrumed on said bail above said latch-bar, an unlocking bar pivotally connected to the lower arm thereof and extending downwardly to and beneath the projecting end of said latch-bar, together with suitable pivotal connections between said hoist-rope and the upper arm or angle of said lever or part, and between said hauling rope and said bail, substantially as shown and described.

2. The combination with a shovel bucket

for use with boom-cranes having a bail pivotally connected to the sides thereof at points in front of the center of gravity of the same when empty, and behind such point when loaded, of a latch-bar pivotally attached to said bail, having a shoulder at a suitable point thereon to engage the bucket when the latter is in an upright position with respect to the bail and having the lower portion of said bar extending downwardly and outwardly with respect to the upper portion of the same, a bell-crank lever, fulcrumed to said bail, an unlocking bar pivotally attached to the lower arm of said lever and extending down and below said lower portion of the latch bar, together with suitable means of pivotally connecting the upper arm of said lever with the hoist-rope of said crane, and the bail itself with the haul-rope thereof, all substantially as shown and described.

3. In a hoisting apparatus having oppositely related hoisting and hauling ropes, the combination, with a bucket pivotally sus-

pended within a bail at points on the sides thereof that are forward of the center of gravity of the bucket when empty, and behind said center when loaded, of a latch-bar pivotally connected to said bail at its upper end, and projecting outwardly and downwardly at an angle at its other end, said bar being of suitable form and dimensions to overhang and engage said bucket when the latter is in an upright position with respect to the said bail; a bell-crank lever, fulcrumed on said bail above said latch-bar, an unlocking bar pivotally connected to the lower arm thereof and extending downwardly to and beneath the projecting end of said latch-bar, said hoisting-rope being fastened to the upper arm of said lever, and said hauling-rope being fastened to said bail, substantially as shown and described.

JOHN P. DOWD.

In presence of—
M. MILLARD,
L. P. LIPPS.