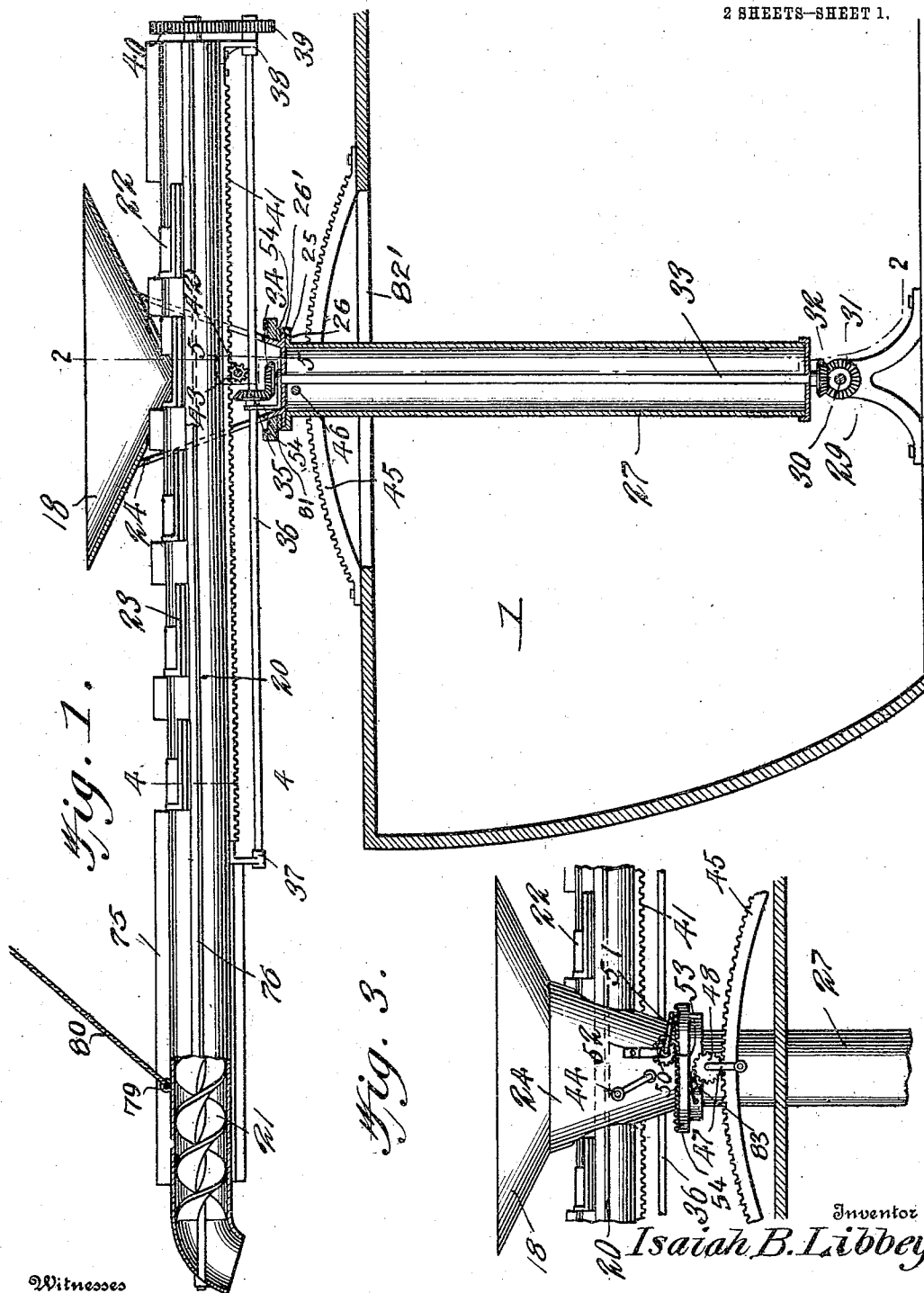


I. B. LIBBEY.
UNLOADING DEVICE.
APPLICATION FILED JULY 16, 1909.

1,054,576.

Patented Feb. 25, 1913.

2 SHEETS—SHEET 1.



Witnesses

Frank B. Hoffman,
Wm. J. Smith.

Inventor
Isaiah B. Libbey
Victor J. Evans
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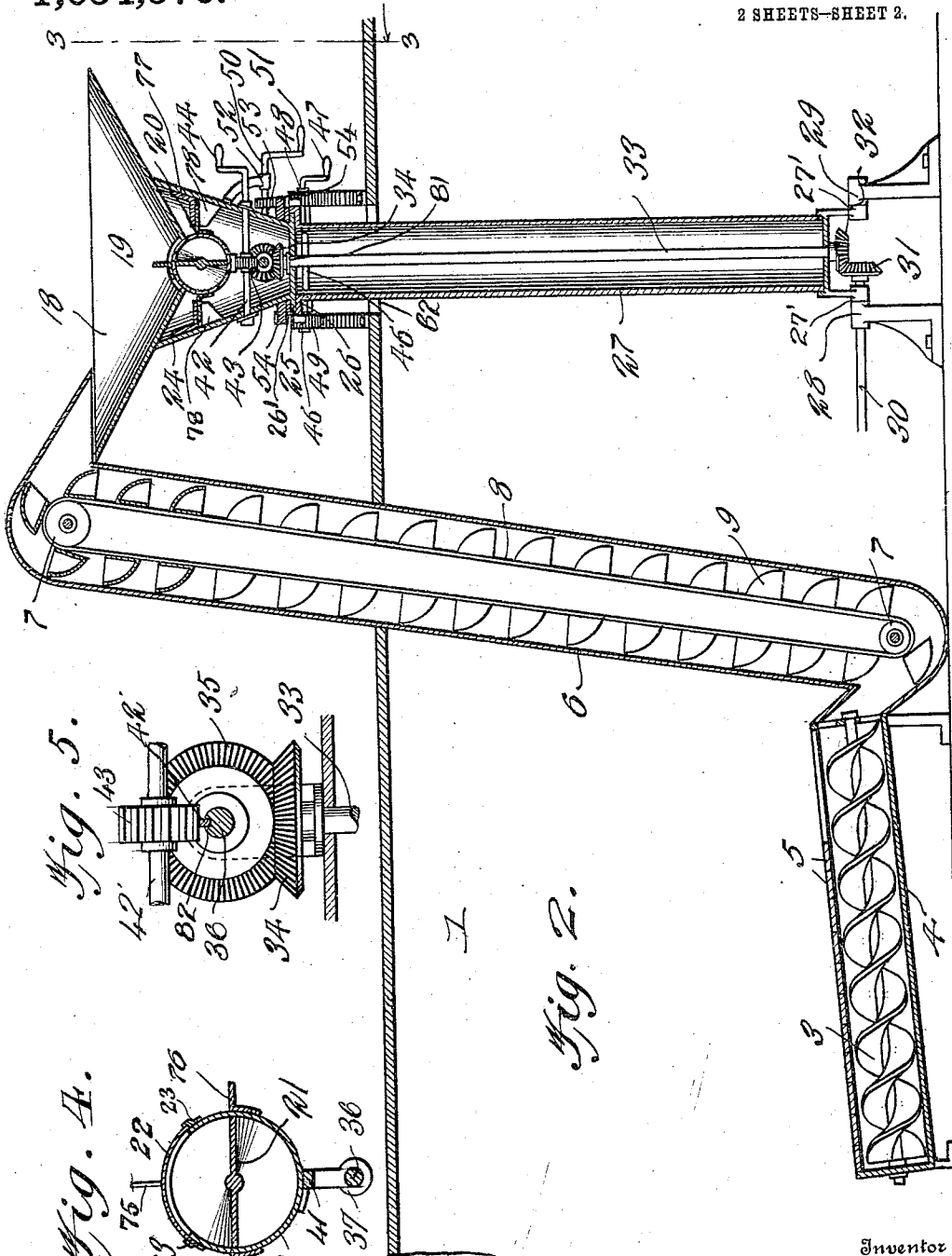


Fig. 5.

Fig. 4.

Fig. 2.

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UNITED STATES PATENT OFFICE.

ISAAH B. LIBBEY, OF CHARLOTTESVILLE, VIRGINIA.

UNLOADING DEVICE.

1,054,576.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed July 16, 1909. Serial No. 508,051.

To all whom it may concern:

Be it known that I, ISAAH B. LIBBEY, a citizen of the United States, residing at Charlottesville, in the county of Albemarle and State of Virginia, have invented new and useful Improvements in Unloading Devices, of which the following is a specification.

This invention relates to unloading devices; the primary object of the same being to provide simple and effective means whereby coal or the like may be delivered from one vessel to another vessel.

With the above object in view the invention resides in the novel construction of elements and their arrangement in operative combination as will hereinafter be fully described and claimed.

In the drawings, accompanying this specification, Figure 1 is a side elevation of the apparatus in applied position upon a vessel, parts of the apparatus; as well as the vessel being in section, the conveyer leg 6 being removed. Fig. 2 is a longitudinal sectional view taken approximately on the line 2—2 of Fig. 1. Fig. 3 is an enlarged detail elevation, approximately on the line 3—3 of Fig. 2, looking toward the direction of the arrows, a portion of the vessel being shown in section and the bucket conveyer 6 being removed. Fig. 4 is a transverse sectional view taken upon the line 4—4 of Fig. 1. Fig. 5 is a detail sectional view taken approximately upon the line 5—5 of Fig. 1 and illustrating the spline or key carried by the beveled toothed wheel 35 engaging within the longitudinal channel provided upon the shaft 36, whereby the said shaft is allowed to travel longitudinally through the bore of the said toothed wheel.

Before proceeding with the description of the details of the apparatus, it may be here stated that while the said apparatus will be alluded to in connection with a collier or other vessel, the said apparatus is not to be restricted as applicable only to a collier or vessel, as the said apparatus may be employed with equal success upon any suitable support.

In the drawings, the numeral 1 designates a collier within the hold of which may be arranged a suitable screw conveyer 3, the latter being provided with a suitable casing 4. The casing 4 may have an open top, the latter being fully or partially closed

through the medium of removable slats 5. Any suitable mechanism may be employed for operating the conveyer, the same not forming a part of the present invention. The conveyer screw 2 has its casing 4 communicating with a bucket conveyer leg 6, the said leg being provided with suitable rollers 7 over which passes an endless belt 8 carrying the buckets 9. The leg 6 extends above the deck of the collier 1 and is provided with a suitable mouth which overlies the hopper 18 of my improved apparatus. The buckets 9 may be operated in any desired manner, the said buckets as well as the leg 6 therefor being of the conventional form and being merely illustrated as a means whereby, when taken in connection with the screw 3, the coal or other material may be raised from the hold of the vessel and delivered to the hopper 18.

The hopper 18 is of a tapering contour and is centrally provided with an outlet mouth 19.

The numeral 24 designates a hollow member which is preferably cone-shaped and which may be connected to the hopper in any suitable or desired manner. The hollow member 24 surrounds the mouth 19 of the hopper 18, and the lower and reduced portion of the said member 24 is provided with an outwardly extending annular flange 25.

The numeral 27 designates a tubular member which has its upper extremity formed with a substantially cross-sectionally L-shaped annular flange or head, the same being designated by the numeral 26 and adapted to receive the flange 25 of the hollow member 24. The flange 25 is retained upon its seat through the medium of a suitable disk or ring 26' which overlies the said flange and which is connected with the off-set portion of the top of the L-shaped head provided for the tubular member 27. The deck of the vessel 1 is provided with an elongated opening through which the tubular member extends, and the lower portion of the said tubular member is preferably closed, through the medium of a suitable cap, as illustrated in Figs. 1 and 2 of the drawings. The said tubular member, adjacent its closed end is provided with oppositely arranged trunnions 27', the latter adapted to be received within bearings provided upon suitable standards 28 and 29,

the said standards having their lower portions off-set and secured to the vessel 1 in any desired manner.

The hollow cone-shaped member 24 is provided with oppositely arranged registering openings, and through these openings extend the casing 20 within which is trunnioned a spiral conveyer 21. The casing 20, is, of course, provided with an open outlet mouth, while the opposite end of the said casing is preferably closed to provide a bearing for one end of the shaft or trunnion of the said spiral 21, and connected with this end of the shaft is a toothed wheel 40, and whereby the said spiral 21 is revolved in a manner which will hereinafter be fully set forth.

The top of the outlet conveyer casing 20 is provided with a plurality of spaced openings, and surrounding the edges of the casing provided by the said openings are cross-sectionally L-shaped members forming ways 23 for sliding doors 22. Any one of these doors is adapted to be slid within its ways to uncover with respective openings in the conveyer casing when the said casing is moved through the openings provided by the hollow member 24, so that material may be delivered within the conveyer casing through the mouth 19 of the hopper 18. The manner in which the said casing is moved will presently be set forth. The casing 20 may be provided with longitudinally extending reinforcing plates 75, the same being arranged upon both the top and bottom of the said casing, and the casing is further provided upon its opposite sides with longitudinally extending combined brace and supporting plates 76. The plates 76 are preferably constructed of L-irons, and the said plates rest upon bearing brackets 78 arranged within the hollow member 24, as clearly illustrated in Fig. 2 of the drawings. The casing 20, adjacent its outlet mouth is provided with a suitable eye 79, the said eye adapted to receive a suspending cable 80, the free end of which latter may be connected with a boom or similar device.

Secured upon the under face of the casing 20 and terminating at a suitable distance away from the outlet mouth thereof, is a longitudinally extending rack bar 41, the teeth of which being engaged by a toothed wheel 43 provided upon a suitable shaft 42 which is arranged transversely of and mounted in bearings in the hollow cone-shaped member 24. The shaft 42 has one of its ends extending a suitable distance beyond the said hollow member 24, and this extending portion is off-set or otherwise provided with a handle 44, whereby the toothed wheel 43 may be rotated to slide the casing 20 either toward or away from the side or end of the vessel or support 1.

The numerals 37 and 38 designate bear-

ings carried by suitable brackets, the same being arranged adjacent the ends of the rack bar 41, and the said bearings are adapted to receive a shaft 36. This shaft 36 is preferably arranged directly below the rack bar 41. The inner and lower closed portion or wall of the hollow member 24 is provided with a suitable bracket 81, the said bracket having its vertical arm provided with an opening through which the shaft 36 extends, and arranged upon the said shaft 36 and mounted for rotation upon the bracket 81 in any desired manner, is a beveled toothed wheel 35. The shaft 36 is provided with a longitudinally extending groove or channel 82, and the toothed wheel 35 has its bore provided with a spline or feather 42 which engages within the said groove 82, and whereby the shaft 36 may be free to move through the bore of the said beveled toothed wheel 35 when the casing 20 is moved longitudinally through the medium of its rack bar and the toothed wheel 43. Meshing with the toothed wheel 35 is a similar beveled toothed wheel 34 carried upon one end of a shaft 35 which is centrally arranged within the tubular member 27 and which finds bearings in openings provided within the bottom of the hollow member 24 as well as through one arm of the bracket 81 and through an opening provided in the removable cap of the said tubular member 27. The opposite end of this shaft 33, which projects through the cap of the tubular member 27 is also provided with a beveled toothed gear, 32, the same meshing with a similar toothed wheel 31 which is provided upon a shaft 30 having a bearing in the standard 28, and connected with any suitable source of power.

Secured to the hollow member 24 and arranged directly above the disk 26 is a ring member 54, the same having its upper face provided with teeth, and these teeth are adapted to be engaged by a toothed wheel 53 carried upon a shaft 50 which is mounted within the bearing provided by a bracket 52. The shaft 50 is bent to provide an off-set handle 51, and by this arrangement it will be noted that means are provided whereby the hopper, hollow member 24, casing 20, as well as the parts carried thereby may be rotated or revolved around the tubular member 27.

Arranged upon the top or deck of the collier 1 adjacent the longitudinal walls formed by the opening through which the tubular member 27 passes, are a pair of arcuate toothed bars 45, the said bars being positioned adjacent the opposite sides of the said tubular member 27. These toothed racks 45 are struck at an arc from the axial center of the shaft 30, and the teeth of the said racks are adapted to be engaged by toothed wheels 48 provided upon a shaft 46 which extends through suitable openings

forming bearings in the tubular member 27. The shaft 46 is extended beyond one of the toothed wheels 48, the said extended portion being bent or otherwise provided with a handle 47. By this arrangement, it will be noted that means are provided whereby the tubular member supporting the remainder of the device may be inclined so as to raise or lower the mouth of the casing 20 as desired.

The shaft 36 extends a suitable distance through its bearings 38 and the said extended portion is provided with a toothed wheel 39, the said wheel meshing with tooth wheel 40 provided upon the trunnion or shaft of the spiral conveyer 21. By this arrangement it will be noted that when the power shaft 30 is in motion, the said spiral conveyer 21 will be rotated within its casing, through the medium of the tooth wheels 34, 35, 39, and 40.

The L-shaped top or ring 26 of the tubular member 27 is provided with a spring pressed pawl 83, the same adapted to engage between the teeth of the wheel 43 to secure the apparatus in a proper position with the arcuate toothed bars or racks 45.

From the above description, taken in connection with the drawings, the construction of the device, as well as the operation and advantages thereof, will it is thought be perfectly apparent to those skilled in the art to which such inventions are pertaining, without further detail description and

35. Having thus described the invention, what I claim is:

1. In a device of the class described, a hopper, a hollow member connected to the hopper and in communication therewith and provided with alining openings, a conveyer casing having a portion arranged within said hollow member and movable through the openings therein, said casing being provided with a plurality of openings adapted for communication with the

hopper, means for moving said conveyer casing relatively to the hopper and hollow member and through the openings within the latter, a conveyer within said casing, and means for driving said conveyer.

2. In an apparatus of the class described, a conveyer casing having a plurality of spaced openings, a conveyer within the casing, a hopper, means adapted to move said casing relatively to the hopper to establish communication between the former and the latter through one of the openings within the casing, a hollow member connected with the hopper and having openings through which the conveyer casing passes, a support for the lower end of said hollow member, and means adapted to revolve said hollow member upon its support.

3. In an apparatus of the class described, a hopper, a hollow member connected to the hopper, and provided with alining openings, a conveyer casing provided with openings and having a portion arranged within said hollow member and in communication with said hopper, a tubular member adapted to support said hollow member, means operable to rotate said hollow member relatively to said tubular member, a shaft within said tubular member, a shaft arranged at right angles to the first-mentioned shaft, driving connections between said shafts, a conveyer within said conveyer casing, connections between the last-named shaft and the said conveyer to drive the latter, means for driving the first-mentioned shaft, the connections between the said shafts being movable whereby motion may be transmitted to the conveyer independently of the movement of the latter with the hopper.

In testimony whereof I affix my signature in presence of two witnesses.

ISAIAH B. LIBBEY.

Witnesses:

W. SAM BURNLEY,
W. W. NORVELL.