May 3, 1932. N. M. LOWER ET AL 1,856,572

STOKER

Original Filed Feb. 10, 1926 2 Sheets-Sheet 1

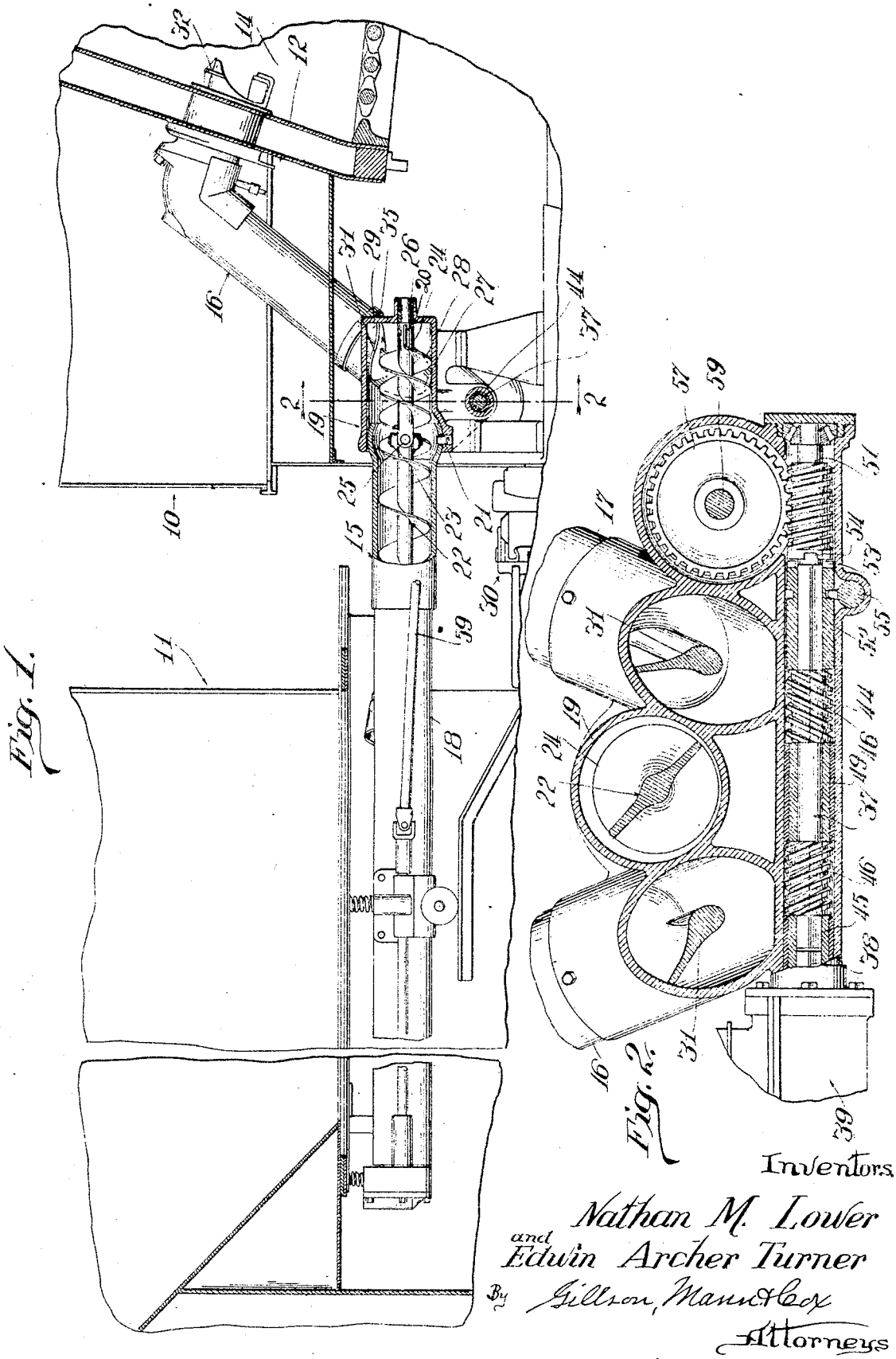


Fig. 1.

Fig. 2.

Inventors

Nathan M. Lower

and Edwin Archer Turner

By Gillson, Mann & Cox

Attorneys

May 3, 1932. N. M. LOWER ET AL 1,856,572

STOKER

Original Filed Feb. 10, 1926 2 Sheets-Sheet 2

Fig. 3.

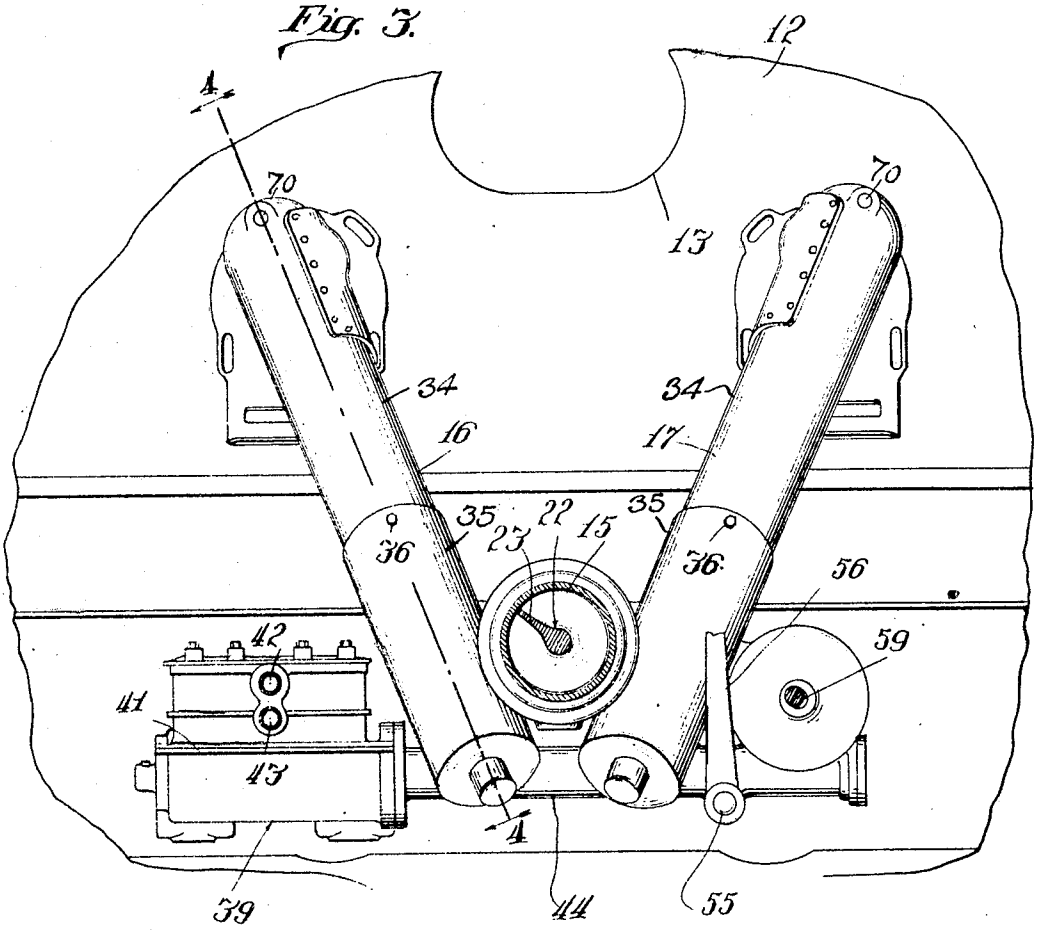
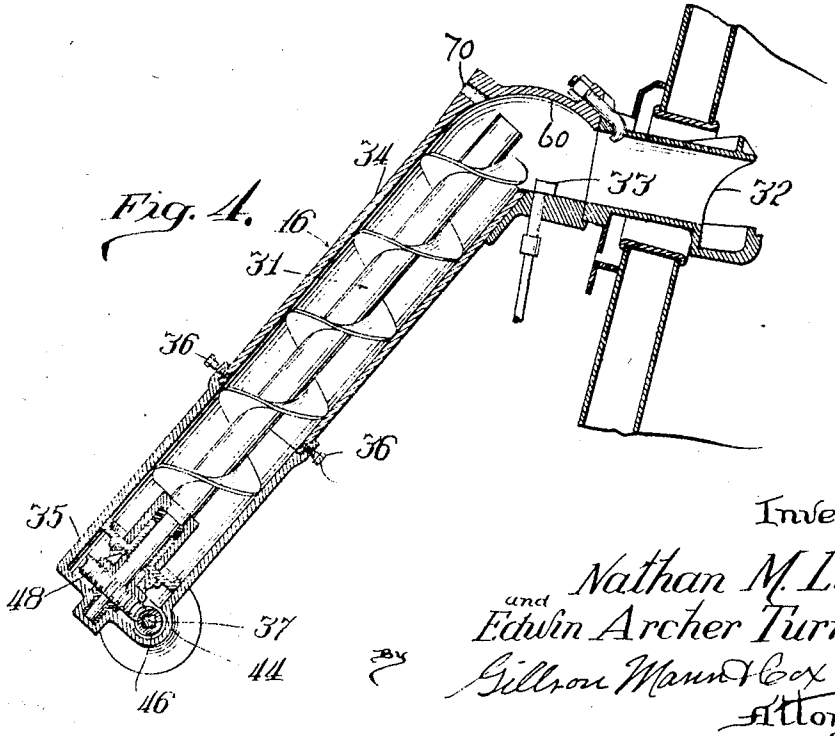


Fig. 4.



Inventors

Nathan M. Lower

and

Edwin Archer Turner

By Gillson Maund & Cox

Attorneys

Patented May 3, 1932

1,856,572

UNITED STATES PATENT OFFICE

NATHAN M. LOWER, OF BALTIMORE, MARYLAND, AND EDWIN ARCHER TURNER, OF NEW YORK, N. Y., ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE STANDARD STOKER COMPANY INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

STOKER

Application filed February 10, 1926, Serial No. 87,220. Renewed March 21, 1931.

This invention relates to stokers, and more particularly to stoker mechanism for locomotives.

One of the objects of the invention is the provision of new and improved means for transferring fuel from the tender to the locomotive and delivering the same to the elevator mechanism.

Another object of the invention is the provision of new and improved means for dividing the stream of fuel brought forward by the conveyer and delivering the same to the two elevator screws.

A further object of the invention is the provision of new and improved stoker mechanism for transferring fuel from the tender and delivering the same in an unbroken stream to each side of the firebox of the locomotive at points below the conventional firedoor opening.

Other objects of the invention are the provision of new and improved stoker mechanism that is simple in construction, efficient in operation, cheap to manufacture, and that is not likely to become broken or get out of order.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawings, in which

Fig. 1 is a side elevation of a portion of a locomotive and tender therefor showing the invention in position thereon, with parts in section, parts broken away and parts omitted for the sake of clearness;

Fig. 2 is a vertical section on line 2—2 of Fig. 1, with parts broken away;

Fig. 3 is a rear elevation of a portion of a locomotive showing the invention in position thereon, with the conveyer in vertical section and with parts broken away; and

Fig. 4 is a section on line 4—4 of Fig. 3, with parts broken away.

On the drawings, the reference character 10 designates a locomotive and 11 the tender therefor. The locomotive 10 is provided with the back wall 12 having the firedoor opening 13 leading to the firebox 14, as is usual in such constructions.

Stoker mechanism is provided for transferring fuel from the tender and distributing the same over the firebox. This mechanism comprises a conveyer casing 15 which is mounted in the usual manner beneath the deck of the tender, and two elevator casings 16 and 17. The conveyer casing 15 is preferably though not necessarily composed of two sections. The rear section 18 of the conveyer casing is provided on its forward end with a ball shaped extension which is adapted to engage in the rear end of the forward section of the conveyer casing 19. The rear portion of this section is in the form of a trough located beneath the tender for receiving the fuel therefrom in the usual manner. A pin 21 rigidly secured in the rear end of the front section of the conveyer casing engages in an opening in the lower portion of the rear section of the conveyer casing for preventing disengagement of the sections of the casing. The opening is slightly enlarged whereby the sections will be held assembled and at the same time will have a relative universal pivotal movement. The joint between the conveyer sections is arranged directly above or, as shown, adjacent to the coupling 30 between the locomotive and the tender, whereby in turning curves a minimum movement of the forward end of the rear section of the conveyer is necessary.

A conveyer screw 22 is mounted in the casing 15. As shown, this screw, comprising the rear section 23 and the forward section 24 connected together by the universal joint 25 in the plane of the joint of the casing, is journaled in the latter as at 26.

The section 24 of the screw is preferably though not necessarily provided with a double flight 27 and 28 which will assist in equally distributing the fuel to the two elevators. The forward ends of the flights 27 and 28 may, if desired, be arranged radially of and in the plane of the axis of the screw, and at opposite sides thereof to form what may be termed paddles, as shown at 20 in Fig. 1. These paddles prevent the accumulation or jamming of the fuel against the forward end of the conveyer by forcing the fuel laterally through an opening at each side of the

conveyer casing into the elevator casings, as will presently appear.

Rigidly connected to the two sides of the casing section 19 are the elevator sections 16 and 17. The common wall between each of the casings 16 and 17 and the section 19 is provided with a suitable opening 29 through which the fuel passes from the conveyer into the two elevator casings.

The elevator casings are each provided with elevator screws 31 for elevating the fuel and delivering it to the distributor tubes 32 which extend into the firebox below the plane of the firedoor opening and at each side thereof, and from which it is projected into the firebox by blasts from the nozzles 33 in a manner well understood in the art. The passages in the upper ends of the casings 16 and 17 are curved as shown at 60, for directing the fuel forwardly into the distributor tubes 32 in front of the nozzles 33. The upper ends of the elevator screws are floating—that is, they are not provided with journals, hence the fuel is unobstructed in its flow from the elevator into the distributor tube. The elbow or curved upper portion of the elevator is preferably provided with an opening 70 through which a bar may be inserted for loosening the fuel should the same become clogged in the elbow or distributor tube. The casings 16 and 17 are each composed of upper and lower sections 34 and 35, respectively. The lower end of the upper section telescopes into the upper end of the lower whereby the sections may be taken apart for inserting or removing the elevator screw. The sections are held assembled in any suitable manner, as by the set screws 36.

The casings 16, 17 and 19 are so arranged that the flights of the screw section 24 are in close proximity to those of the elevator screws, the casing 19 being so constructed that the fuel brought forward by the conveyer is delivered from a point between the ends of said conveyer directly to the flights of the elevator screws instead of delivering the same from the end of the conveyer into the elevator casings as is the usual practice. As shown, the fuel is delivered to the elevator casings from each side of the conveyer screw. The parts are so arranged that the fuel flows in a continuous stream through the conveyer and upward through each elevator.

In the present construction the casing 19 is only slightly larger in diameter than the conveyer screw, whereby the flow of the fuel along the conveyer is uniform and the proper division made for the two elevators. The casings 16 and 17 are inclined rearwardly from their upper to their lower ends whereby the fuel will readily pass in uniform streams from the conveyer upwardly therethrough. Preferably, though not necessarily, the inclination of the elevators is such that the three screws meet at or adjacent to the universal joint in the conveyer casing.

The conveyer and elevator screws are all operated from a common shaft 37 which in turn is operated either directly or through reduction gears from the crank shaft 38 of a motor 39. The motor may be of any type, that shown being a four cylinder steam engine 41 having the intake and exhaust ports 42 and 43, in common. For the sake of clearness of illustration the piping is omitted. The engine is reversible in the usual manner. Since the details of the engine constitute no part of the present invention it is not thought necessary to illustrate or further describe the same.

The shaft 37 is mounted in a casing or bearing 44 which extends transversely of the locomotive beneath the conveyer casing. The crank shaft 38 and adjacent end of the power shaft 37 are connected together through the sleeve 45. A plurality of sleeves 46 having worms thereon are mounted on squared portions of the shaft 37 for rotating therewith for operating the elevator screws 31 through the worm gears 48. A spacing sleeve 49 is mounted on the shaft 37 between the two worm gear sleeves 46. The worms on the sleeves 46 are threaded in opposite directions whereby the side thrust of one is counteracted by that of the other.

Suitable means are provided for operating the conveyer screw from the shaft 37 and for operating the elevator screws independently of the conveyer screw. As shown, a sleeve 51 having a worm thereon is rotatably mounted on the shaft 37. It is clutched to the shaft through a clutch sleeve 52, slidably but non-rotatably mounted thereon. The sleeve 52 is provided with clutch teeth 53 which are adapted to engage corresponding recesses 54 in the worm sleeve 51. The sleeve 54 is shifted by a shifter member 55 which is operated manually by a lever 56, see Figs. 2 and 3. A worm gear 57 rotated by the worm on the sleeve 51 is adapted to operate the conveyer screw through the shaft 59 that extends to the rear of the conveyer. The shaft 59 is connected to the conveyer screw 22 through suitable gearing in the usual manner.

When the parts are in the position shown in Fig. 2 and the motor is operated, the elevator screws will be operated and the conveyer screw will remain at rest. Since the motor may be reversed, the elevator screws may be operated in either direction without operating the conveyer screw.

We claim as our invention:

1. In a locomotive stoker, in combination, a transfer conduit, a pair of elevator conduits each having communication with the transfer conduit through a lateral opening, a transfer screw in the first named conduit, the forward end of which has a plurality

of vanes each terminating opposite the lateral openings in a longitudinal and axially disposed extension, and a screw in each of the elevator conduits, such screws extending respectively across the lateral openings whereby fuel is positively delivered from the transfer screw to the elevating screws.

2. In a locomotive stoker, in combination, a transfer conduit, a pair of elevator conduits each having communication with the transfer conduit through a lateral opening, a transfer screw in the transfer conduit, a screw in each of the elevator conduits, such screws extending respectively across the lateral openings, and means forming a part of the transfer screw for urging fuel laterally into the elevator conduits.

3. In a locomotive stoker, in combination, a transfer conduit, a pair of elevator conduits each communicating with the transfer conduit through a lateral opening, a transfer screw in the first named conduit, a screw in each of the elevator conduits and extending respectively across the lateral openings, and means forming a part of the transfer screw for urging fuel from the lower portion of the transfer conduit laterally into one of the elevator conduits, and for urging fuel from the upper portion of the transfer conduit into the other elevator conduit.

4. In a locomotive stoker, in combination, a transfer conduit having a lateral delivery opening at its forward end portion at each side thereof, a pair of elevator conduits located one at each side of the transfer conduit and being open respectively to the delivery openings thereof, a conveying screw in the transfer conduit and extending across the delivery openings thereof, the forward end of the screw having two vanes, the ends of which project parallel with the screw axis and are radially disposed.

In testimony whereof we affix our signatures.

NATHAN M. LOWER.
EDWIN ARCHER TURNER.