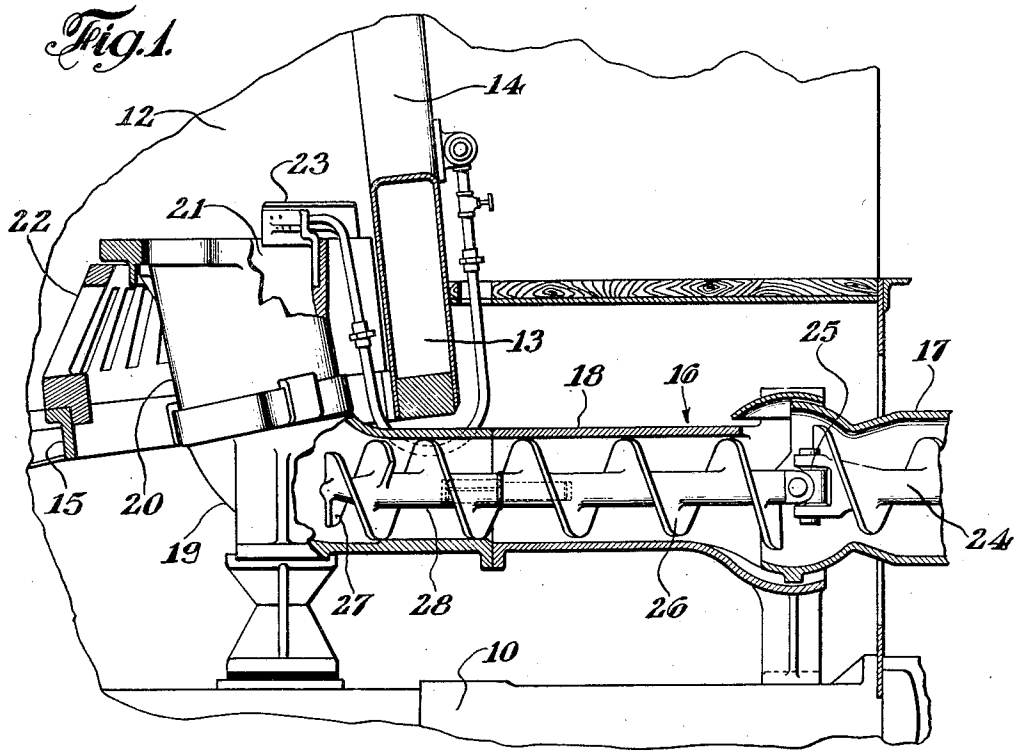
July 5, 1932. E. A. TURNER 1,866,181

STOKER CONSTRUCTION

Filed May 11, 1929

Fig. 1.



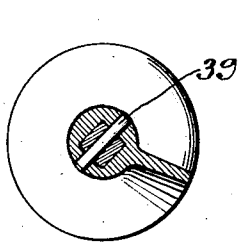


Fig. 3.

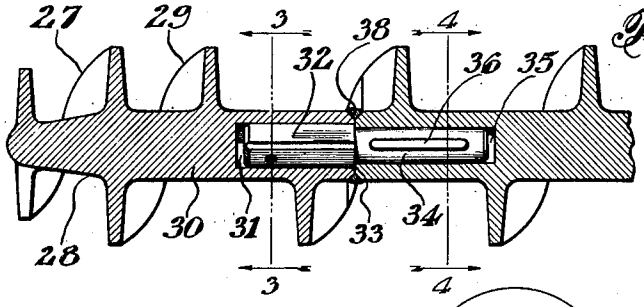


Fig. 2.

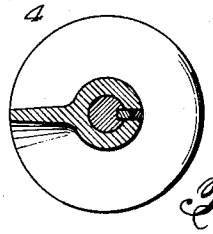
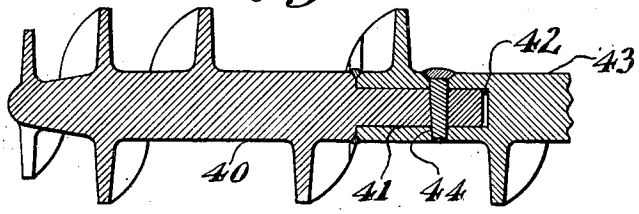


Fig. 4.

Fig. 5.



INVENTOR

E. Acker Turner

Patented July 5, 1932 1,866,181

UNITED STATES PATENT OFFICE

EDWIN ARCHER TURNER, OF NEW YORK, N. Y., ASSIGNOR TO THE STANDARD STOKER COMPANY, INCORPORATED, A CORPORATION OF DELAWARE

STOKER CONSTRUCTION

Application filed May 11, 1929. Serial No. 362,150.

My present invention relates to the fuel feeding system of a stoker and especially to, and has for its main object, the provision of a new and improved novel form of conveying element such as the helicoid screw conveyor of the type, as generally exemplified in the United States Letters Patent No. 1,690,116, granted November 6, 1928, to Andrew M. Hunt.

In stokers of the type for which the invention is more particularly designed, the fuel is moved beyond the forward end of the screw conveyor, forwardly and upwardly through a conduit to a point above the fire and is there distributed over the fire by suitable fuel scattering means. This conduit portion of the feed system usually is angularly disposed and curved upwardly from the forward end of the screw, and is adapted to turn or direct the fuel upward as it is fed forward by the screw conveyor. The forward end of the screw terminates at the bend or elbow portion of the conduit and as the fuel is turned or forced upward through the elbow and the remaining riser portion of the conduit, the re-action not only tends to lift or raise the forward end portion of the screw, but it also subjects the impelling face of the forward spiral threads of the screw to severe abrasion, causing their rapid wear. In practice it has been found that in forcing the fuel forward through the riser element of the conduit the severe frictional wear reduces the thickness of the threads or flights at the forward end of the screw to a knife edge at their periphery, the wear diminishing and showing no appreciable reduction in the thickness of the rearward threads. When the forward threads become so worn, the effective conveyance of the fuel is materially decreased and it becomes necessary to renew the screw conveyor. This invention has for one of its objects to provide a screw having a separable and renewable forward end portion, obviating the need for replacing the screw conveyor in its entirety when the threads at its forward end are worn excessively.

I find in the use of such stokers that care must be taken not to reduce the area of the passage at the terminus of the screw, so as not to interfere with the advancing movement of the fuel. The area of the passage at this point can be increased, and additional impelling surface provided on the forward flights or threads of the screw by tapering the hub or core of the screw inwardly to a rounded point or nose at its extreme forward end. This tapering of the hub is considered an important feature of the renewable screw portion of the invention.

More specific objects and other advantages of my invention will appear from the following description when read in connection with the accompanying drawing which illustrates two embodiments of the invention, wherein,

Fig. 1 is a fragmentary vertical longitudinal sectional view of the rear end of a locomotive with the feeding conveyor of a stoker shown partly in section and partly in elevation with some portions broken away;

Fig. 2 is an enlarged central vertical sectional view of the forward portion of a screw conveyor;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a section on line 4—4 of Fig. 2; and

Fig. 5 is a view in vertical section similar to Fig. 2 illustrating a modified form of the invention.

On this drawing the numeral 10 indicates a lomocotive having the firebox 12 with a backwall 13 in which there is the conventional hand firing opening 14 through which fuel may be hand fired on to the grates 15 of the firebox. 16 is a feeding conduit through which the fuel is carried from the locomotive tender to the firebox. This conduit comprises the rear section 17 which extends rearward to the tender and the forward housing section 18, these sections being connected with a universal joint as is customary. At the forward end of the section 18 is an upturned elbow 19 which supports and is in communication with a riser tube 20 extending upwardly into the firebox through the grates 15 and which rises to the discharge mouth 21, this riser tube being surrounded by the protecting grate 22. Positioned at the discharge mouth is a distributor head 23 which is adapted in a well known manner to scatter the fuel over

the fire. The fuel is moved through the conduit 16 by a multiple sectional screw conveyor revolvably mounted therein, and consisting of the rearward section 24 being universally connected at 25 to the forward section 26. The screw may be driven from the extreme rearward end of the section 24 and the motion transmitted through the joint to the forward screw section. This forward section of the screw at its forward end only is provided with the additional thread 27 as illustrated and fully set forth in the Hunt patent referred to previously.

In my invention the forward screw section 26 is formed at its forward end with a renewable portion 28 which is of sufficient length to carry one or more flights or threads. In this forward portion is formed the usual flight or thread 29 on the hub or core 30 which also carries the additional thread 27. The portion 28 is removably attached in fixed relation at its rear end in any suitable manner to the forward portion of the screw section 26. A noncircular, preferably, a square cavity 31 is cored or otherwise formed in the rearward end of the hub 30 and is adapted to receive the square end 32 of a connecting shaft 33, the opposite end 34 of which is round and is received in a seat 35 in the front portion of the screw 26. The shaft 34 is preferably a tight fit in the seat 35 and may be properly secured therein by the key 36, which key may be held in position by filling in the keyway in the hub by welding as best shown in Fig. 4. The respective ends of the screw portions connected together by the shaft 33 may be chamfered as at 38 and welded together to assist in relieving the shaft 33 from taking the entire torsional stress occurring in the driving of the screw. The forward screw portion 28 loosely slides on the square portion of the shaft 33 and may be held in position thereon and its longitudinal movement prevented by the pin 39 extending through its hub portion and the square end 32 of the shaft 33.

In the modified form of the separable forward screw portion shown in Fig. 5, and indicated by the numeral 40, the hub is reduced in diameter at its rearward end to form a tongue or dowel 41 which extends rearward and is received in a seat 42 of the rear screw portion 43. The pin 44 prevents longitudinal movement of the front end portion and the two portions of the screw are held in driving relationship by the pin and by the joining together by a welding process of the respective ends of the hub portions of the screw.

In both forms of the invention it will be observed that the hub of the renewable screw portion tapers inwardly at its forward end.

This invention provides a novel screw construction which permits that portion of a forward screw section that becomes worn more rapidly than its remaining portion to be replaced without involving the expense of renewing the screw in its entirety.

I claim:

As an article of manufacture, a rigid conveyer screw consisting of cast metal separable sections, each comprising a core portion and an integral flight portion, the ends of the core portions of the sections being interseated and the joining edges of the flights being contiguous, said sections being united in rigid relationship by means of welding extending circumferentially of the section cores at their juncture and throughout the entire periphery as well as throughout the contiguous edges of the flight portions and means spaced apart from said welding lengthwise of the screw and extending transversely into the interseated core portions.

In testimony whereof I affix my signature.

EDWIN ARCHER TURNER.