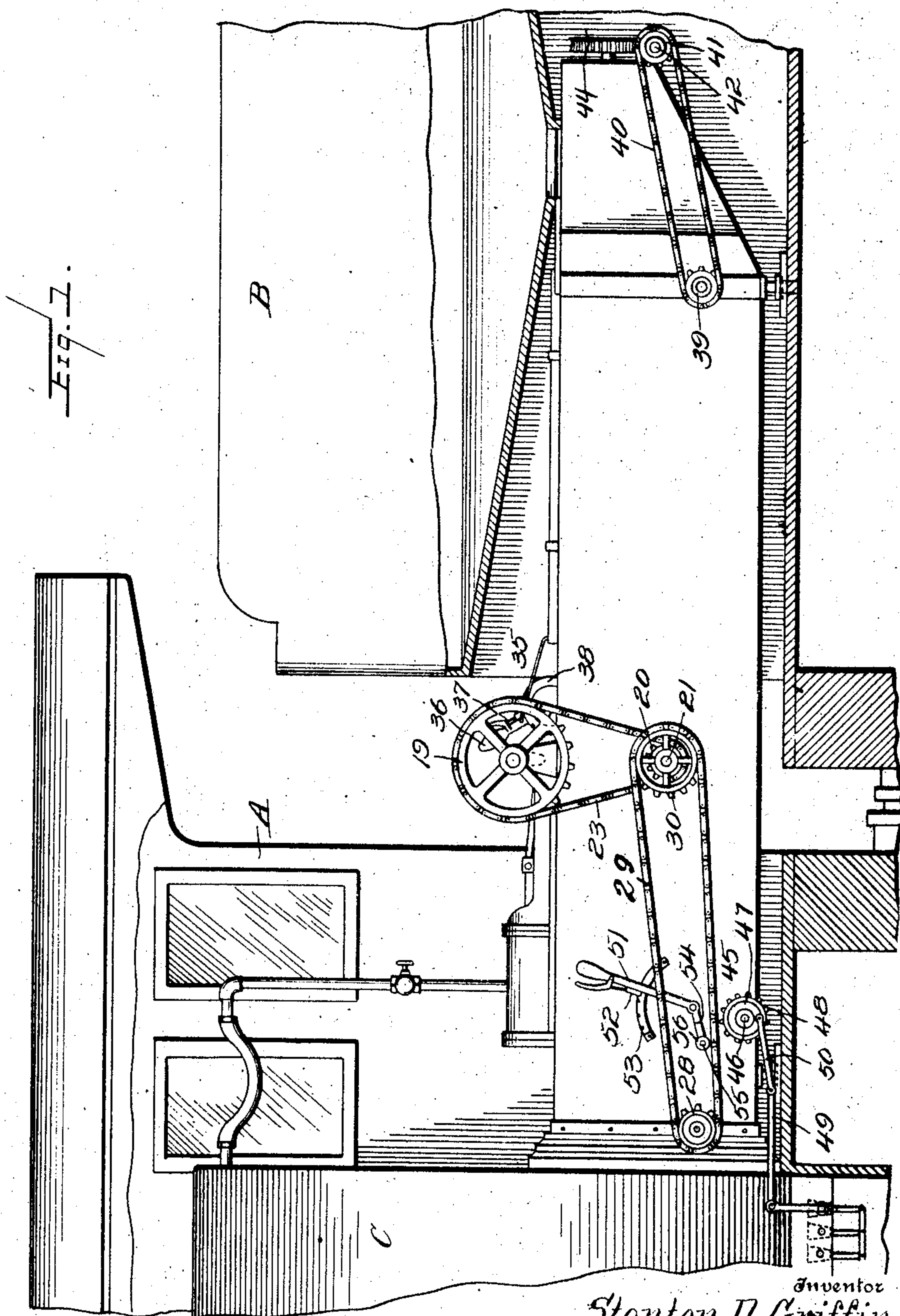


948,220.

S. D. GRIFFIN.
LOCOMOTIVE AUTOMATIC STOKER.
APPLICATION FILED JULY 27, 1909.

Patented Feb. 1, 1910.

3 SHEETS—SHEET 1.



Witnesses
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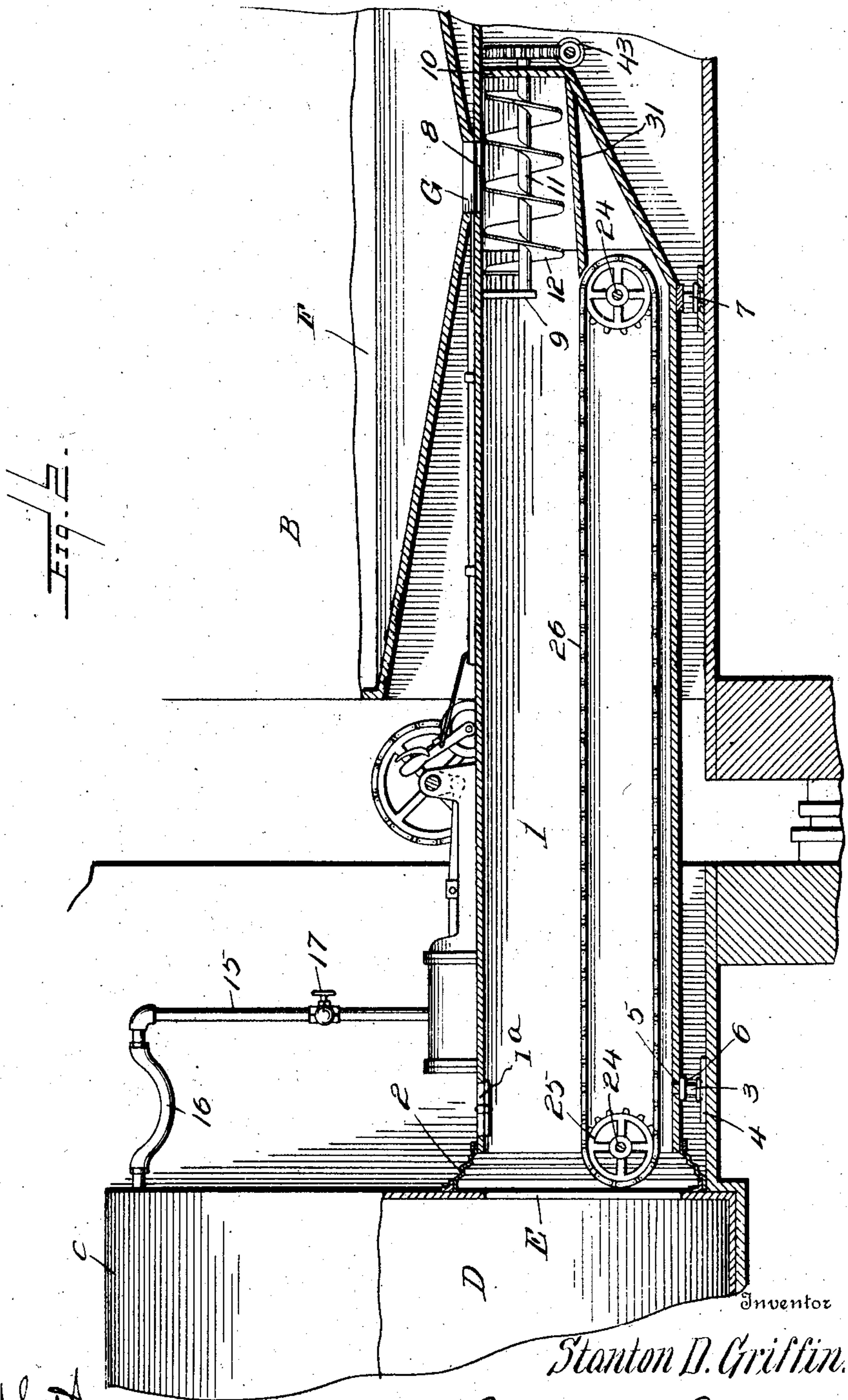
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

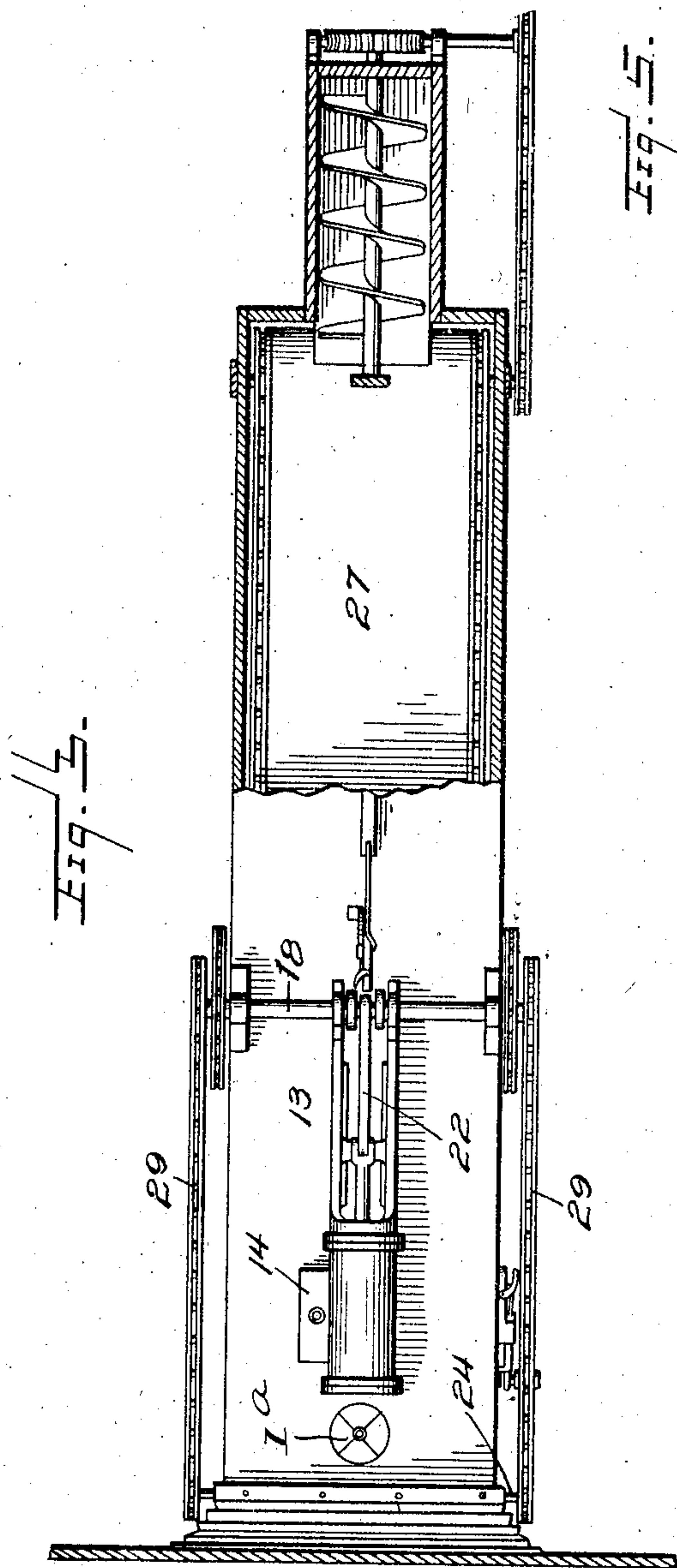


Fig. 5.

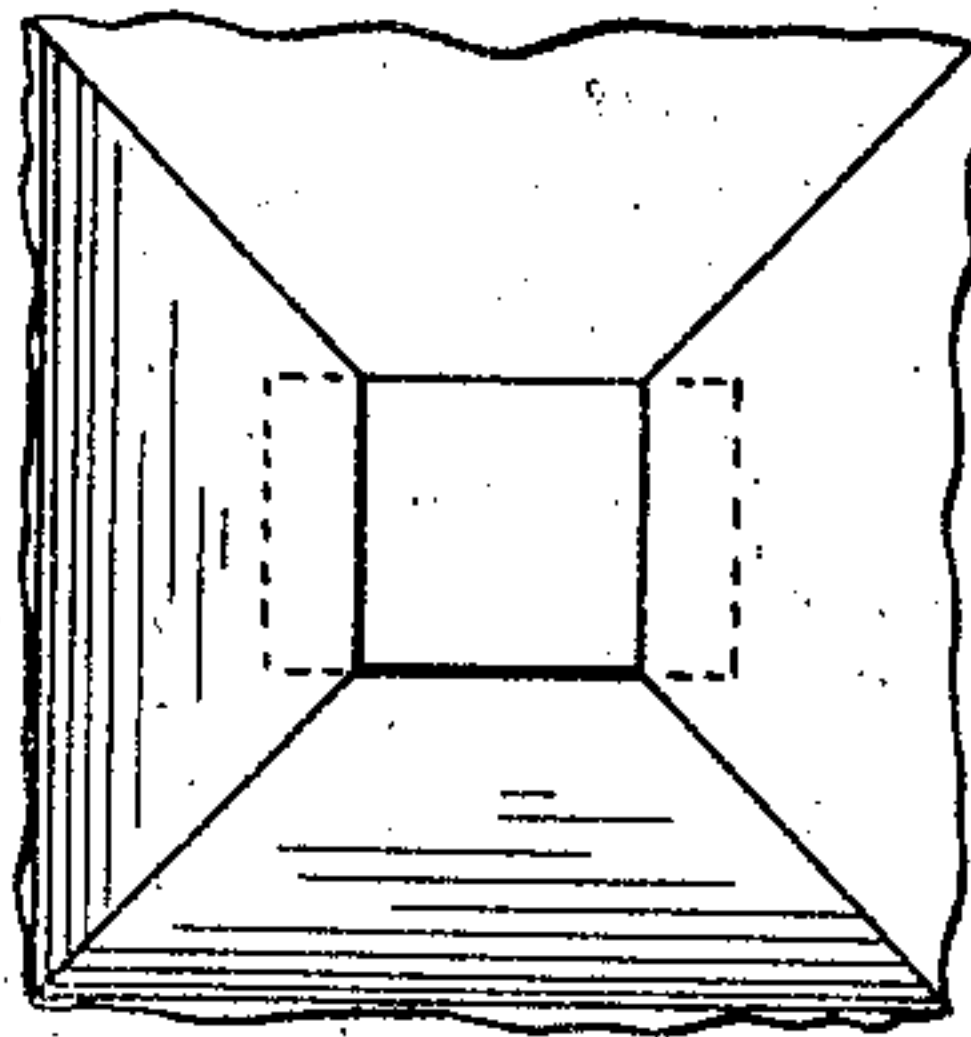
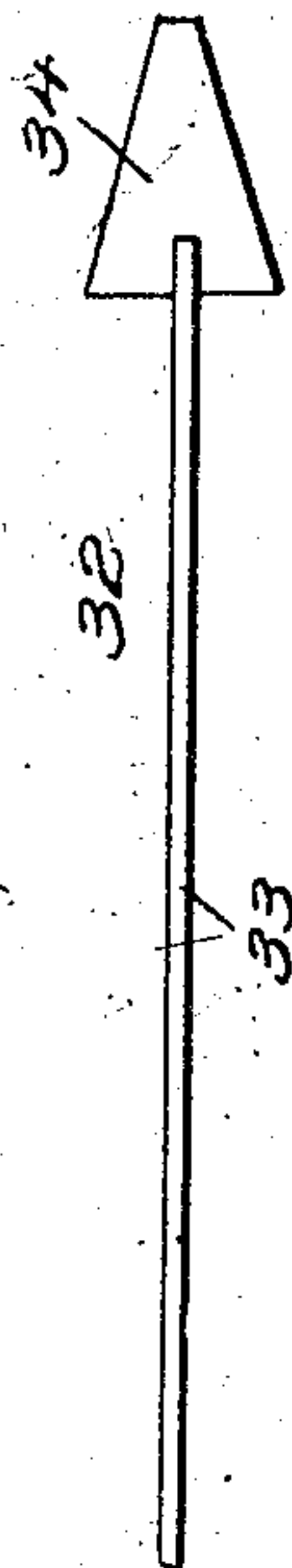


Fig. 4.



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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE AUTOMATIC STOKER.

948,220.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed July 27, 1909. Serial No. 509,949.

To all whom it may concern:

Be it known that I, STANTON D. GRIFFIN, a citizen of the United States, residing at West Point, in the county of Clay and State of Mississippi, have invented new and useful Improvements in Locomotive Automatic Stokers, of which the following is a specification.

This invention relates to automatic stokers for locomotives or the like and has for an object to provide an apparatus of the character that will include in its combination of elements or parts a receptacle mounted at one end to the fire door opening of the locomotive and mounted at its other end in the tender which latter is provided with a feed passage adapted to deliver coal from the tender to a spiral carrier or the like which latter, in turn, delivers the coal to an endless conveyer arranged directly in line with the fire door opening so that coal can be fed directly into the furnace.

A still further object of my invention is to provide an automatic stoker in which the endless conveyer above described is operatively connected with driven mechanism actuated by a stationary engine, which latter is adapted to receive steam from the boiler of the locomotive.

A still further object of this invention is to provide a grate shaking apparatus which may be operated automatically simultaneously with the stoking operation.

Other objects and advantages will be apparent as the nature of the invention is better disclosed and it will be understood that changes within the scope of the appended claims can be made without departing from the spirit of the invention.

In the drawings forming a portion of this specification and in which like characters of reference indicate similar parts in the several views, Figure 1 is a side elevation of a locomotive and its tender showing the application of my improved stoker thereto, parts of the locomotive and tender being broken away in order to more clearly illustrate the invention. Fig. 2 is a view similar to Fig. 1, showing the stoker in section and parts of the locomotive and tender. Fig. 3 is a top plan view of the stoker. Fig. 4 is a plan view of the cut-off gate. Fig. 5 is a detail top plan view of a portion of the discharge hopper carried by the locomotive tender.

Briefly, my invention may be described as being adapted particularly in use with a

locomotive A of the form shown in Fig. 1, and as illustrated, the said locomotive has connected thereto a tender B. The locomotive herein shown is provided with a boiler C and with a furnace D. The rear head of the furnace is provided with a fire door E. The tender B is formed with a hopper bottom F which has a discharge opening G formed therein at the point of intersection of the walls of the hopper.

My improved stoker consists preferably of an elongated receptacle 1, which is preferably entirely closed, excepting at its front end, and at this point the receptacle is connected to the furnace D of the locomotive by means of a member 2. The inner edge of the member 2 surrounds the opening E formed in the furnace so that the front end of the receptacle 1 is disposed immediately in line with said opening. The member 2 herein illustrated is preferably of accordion form and is adapted for universal movement to accommodate for the relative movements between the locomotive and tender. A bearing member 3 is slidably mounted at its lower end in a guide member 4 which is secured in any suitable manner to the floor of the cab of the locomotive and the upper end of the said bearing is mounted in a slot 5 formed in the bottom of the receptacle 1. The bearing member 3 is provided with a stop shoulder 6, which is located immediately beneath the bottom of the receptacle 1 as clearly shown in Fig. 2 of the drawings. The rear end of the receptacle 1 is supported by a bearing 7. This construction is such that I accommodate for the universal movement of the member 2. It will, of course, be understood that any suitable material may be employed in the construction of the member 2 providing it be of fire resisting substance.

The top wall of the receptacle 1 is provided with a passage 8, which is located immediately beneath the passage G, the latter being of less size than the former. A bracket 9 extends downwardly from the top of the receptacle 1 at a point forwardly of the passage 8 and is located in suitable spaced relation to the rear wall 10 of the receptacle. The rear wall 10 receives one end of a shaft 11, the other end of said shaft being mounted in the bracket 9. The shaft 10 has integrally formed therewith or otherwise secured thereto a spiral conveyer 12, which, incident to the position of the shaft 11, extends

longitudinally of the receptacle 1 and is disposed with a portion beneath the passages formed in the top of said receptacle. A stationary engine 13 is mounted upon the top of the receptacle 1 at a point adjacent to the forward end thereof. The engine can be of any suitable construction, but will be briefly described as having a steam chest 14 to which is connected one end of a steam pipe 15. It will, of course, be understood that steam from the chest 14 will be admitted in the usual manner to the cylinder of the engine for the purpose of operating the reciprocating piston. The upper end of the pipe 15 is connected to the boiler C of the locomotive by a flexible pipe or joint 16. As shown, the pipe 15 is provided with a hand-operated valve 17, which may be actuated at the will of the operator to admit steam to the chest 14. The engine 13 operates a drive shaft 18 which is mounted in suitable bearings which arise from the top of the receptacle 1. The drive shaft is provided with a sprocket gear 19 which is located immediately above a sprocket gear 20 carried by a countershaft 21. As shown in the drawings, the piston of the engine 13 is operatively connected with a pitman rod 22 which has its rear end connected with the crank of the shaft 18, but I do not desire to limit myself to this construction as it is obvious that any means may be employed for imparting rotary movement to the shaft 18. In order that the countershaft 21 will be revolved simultaneously with a corresponding movement to the shaft 18, I connect the former with the latter by means of a sprocket chain 23. A pair of horizontally disposed revoluble shafts 24 are mounted at their ends in the side walls of the receptacle 1, each shaft being provided with a pair of sprocket gears 25. The gears 25 upon the said shaft are disposed in line with each other and receive sprocket chains 26. It will be seen that the sprocket chains are suitably spaced from each other and are arranged in juxtaposition to the side walls of the receptacle 1. The chains 26 are connected to each other by means of an endless carrier or belt 27 of any suitable construction. The shaft 24 which is located adjacent to the forward end of the receptacle is provided with sprocket gears 28 which are connected by means of drive chains 29 with sprocket gears 30 upon the countershaft 21.

An inclined table 31 is mounted within the receptacle 1 and is located immediately beneath the spiral conveyer 12 and as shown, this table has its forward end disposed slightly above the rear end of the belt 27 so that coal fed from the spiral conveyer will be deposited upon the upper lead of the belt 27.

A sliding gate 32 is mounted upon the top of the receptacle 1 at a point in advance of

the engine 13. The gate 32 consists of a longitudinally extending rod 33 which is provided at its forward end with a closure 34. The rear end of the rod 33 is connected by means of a link 35 with an operating lever 36 which is provided with a suitable pawl 37 adapted for cooperation with a rack segment 38. The location of the gate 32 is such that the lever 36 can be operated so that the closure 34 can be thrown across the passage 8 formed in the receptacle 1 so that communication between the receptacle and the hopper F of the tender can be closed. When the closure 34 is moved away from the opening 8, it will be seen that coal within the tender B will be free to fall by gravity through the opening 8, whereupon, it may be taken up by the spiral conveyer. The shaft 24 adjacent to the rear end of the receptacle 1 has one of its ends extended outwardly of one of the sides of the receptacle and has secured thereto a sprocket gear 39 which is connected by means of a chain 40 to a sprocket gear 41 upon a shaft 42. The shaft 42 is carried by the rear wall of the receptacle 1 and has secured thereto a worm or screw-gear 43 adapted to intermesh with a worm gear 44 at the rear end of the shaft 11. This construction is such that power is simultaneously applied to the spiral conveyer and to the endless belt 27.

It will, of course, be understood that the grate bars of the locomotive furnace can be of any suitable well known construction, but in this instance, the grate bars are of the rocking type and are adapted to operate within the fire box. A shaking apparatus is illustrated at 45 and consists of a stub shaft 46 which extends from one of the side walls of the receptacle 1 and has secured thereto a crank wheel or eccentric 47 which is provided with a peripheral series of sprocket teeth 48. The teeth of the wheel 47 are located beneath the lowermost lead of one of the drive chains 29 and are adapted to mesh with the chains in a manner to be hereinafter stated. The grate of the furnace is provided with a sliding rod 49 which is connected at one end to a pitman rod 50 carried by the wheel 47. A lever 51 is pivotally mounted to one of the side walls of the receptacle 1 and is provided with a pawl 52 adjustably connected with a rack bar 53. The lever 51 is provided with an angularly disposed portion 54 which carries at its forward extremity a pin 55 which is located between the upper and lower leads of one of the chains 29. The pin 55 carries a revoluble roller 56 which is adapted, when the lever 51 is actuated in one direction, to be forced against the lowermost lead of the chain previously described, so that the links of the chain can be forced into mesh with the peripheral series of teeth upon the wheel 47. Assuming the engine 13 to be in opera-

tion, it will be seen that when the lever 51 is actuated in the manner just described, so that the chain will mesh with the teeth of the wheel 47, the latter will be revolved and will actuate the pitman rod 50 so as to effectively impart to the rod 49 a reciprocatory or sliding movement.

In operation of the stoker, steam from the boiler C can be discharged into the steam chest of the engine 13, whereby the reciprocatory motion will be imparted to the piston of the engine so that in turn such motion will impart the desired rotary movement to the shaft 18, hence the various hereinbefore described operative parts of the stoker will be simultaneously operated. When the closure 34 is moved away from the passage 8, formed in the receptacle 1, it will be seen that the coal from the tender will fall by gravity upon the spiral conveyer 12, and in movement of said conveyer, the coal will be carried forwardly and will be dumped or discharged upon the rear end of the endless belt 27. It is thought that further description relative to the operation of the apparatus is unnecessary, but it will be briefly stated that any movement of the belt 27, the coal collected thereby, will be finally deposited into the furnace D of the locomotive by way of the fire door E.

The receptacle 1 is provided at a point adjacent to the furnace of the locomotive with a damper 1^a which can be operated to introduce the desired quantity of air into the furnace as will be understood.

What is claimed is:—

1. The combination with a furnace having

a grate-carried reciprocating bar, of a stoker comprising a receptacle, said receptacle having a forward open end portion disposed in line with the fire door opening of the furnace, a conveyer located within the receptacle, a hopper communicating with the conveyer, a revoluble crank wheel carried by the receptacle, operative connections between the crank wheel and the sliding bar, said crank wheel being provided with a peripheral series of gear teeth, a motor operated drive chain connected with the said conveyer, and means for actuating the drive chain so that the links thereof will be thrown into mesh with the said peripheral teeth of the crank wheel.

2. In an apparatus of the class described, a locomotive and tender therefor, a receptacle opening at one end into the tender and at its other end into the furnace of the locomotive, a conveyer operating in the receptacle, driving means for the conveyer, a grate-carried reciprocating bar, a gear wheel operatively connected with the said reciprocating bar, said driving means for the conveyer having a driving chain which is disposed immediately above the said gear wheel, and means for engaging the said chain with the gear wheel for simultaneously reciprocating the said bar upon operation of the conveyer.

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

STANTON D. GRIFFIN.

Witnesses:

W. R. HICKS,
G. W. WILEY.