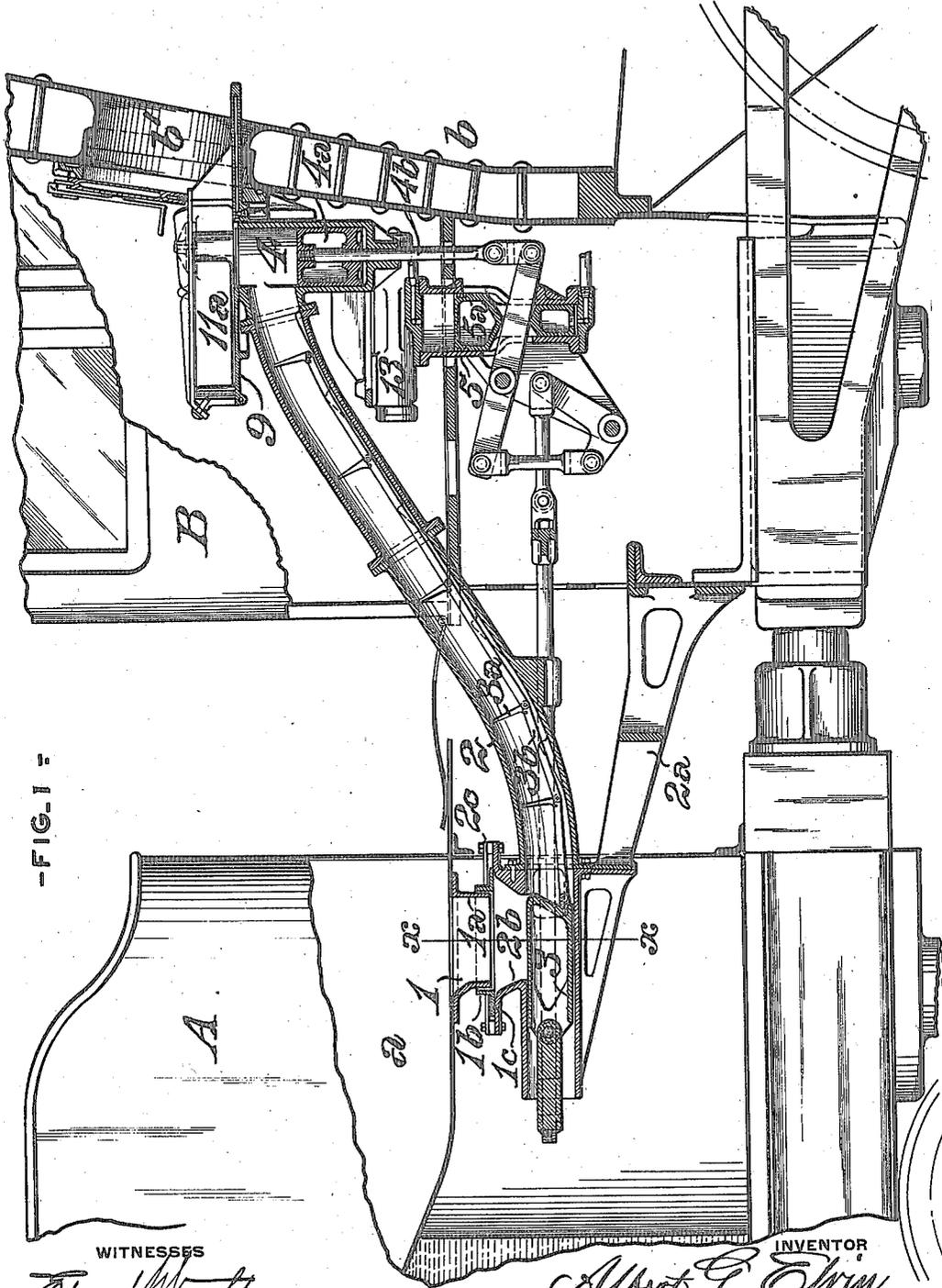


1,190,741.

A. G. ELVIN.  
MECHANICAL STOKER.  
APPLICATION FILED DEC. 30, 1914.

Patented July 11, 1916.  
2 SHEETS—SHEET 1.



-FIG. 1-

WITNESSES

*Edward Wright*  
*S. R. Bell.*

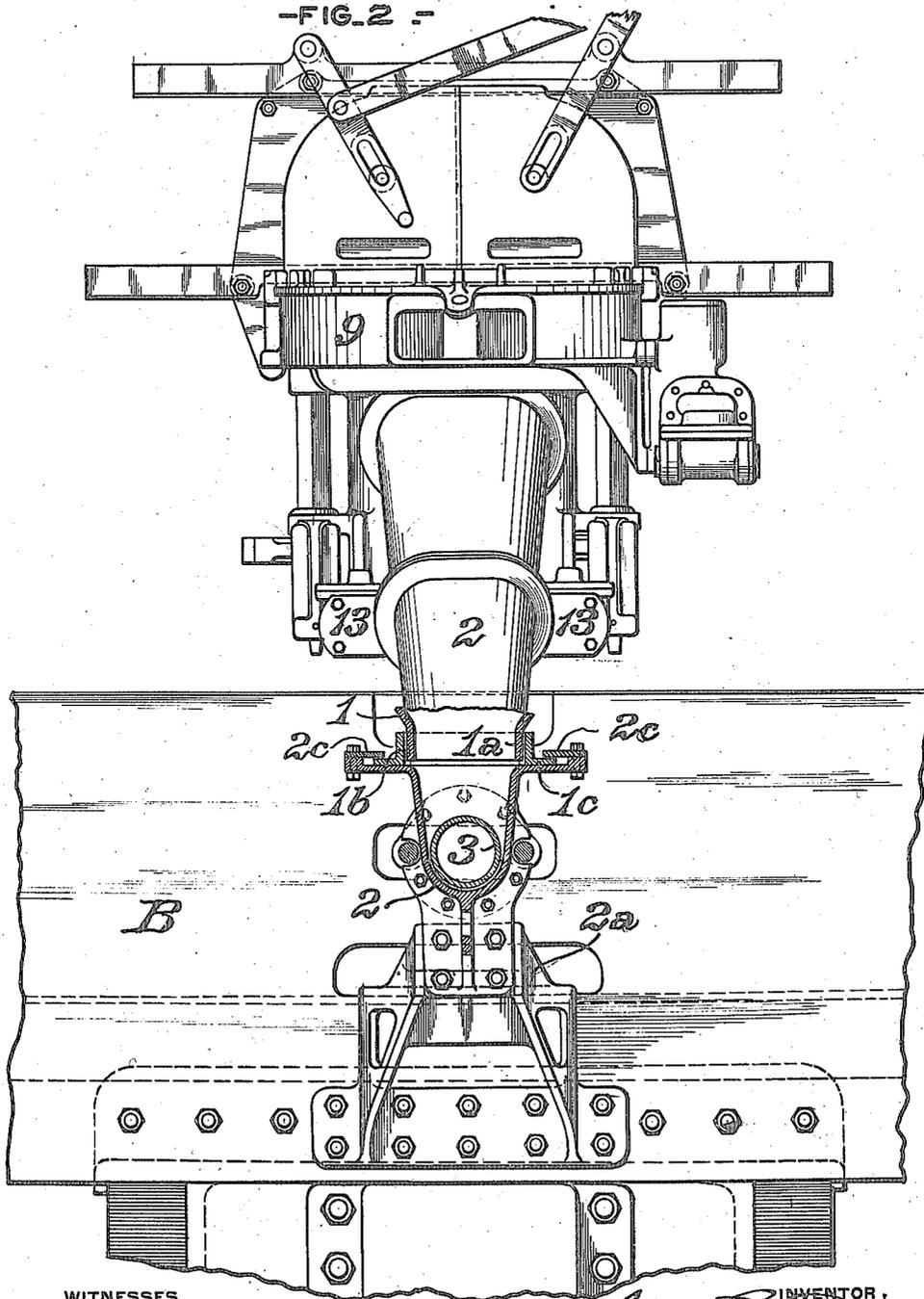
INVENTOR

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INVENTOR

*Albert G. Elvin*  
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# UNITED STATES PATENT OFFICE.

ALBERT G. ELVIN, OF SOMERVILLE, NEW JERSEY.

## MECHANICAL STOKER.

1,190,741.

Specification of Letters Patent.

Patented July 11, 1916.

Application filed December 30, 1914. Serial No. 879,683.

*To all whom it may concern:*

Be it known that I, ALBERT G. ELVIN, of Somerville, in the county of Somerset and State of New Jersey, have invented a certain new and useful Improvement in Mechanical Stokers, of which improvement the following is a specification.

My invention relates to appliances for mechanically transferring fuel from a tender to a locomotive and feeding it, in quantities as required for steam generation, to the firebox thereof, one type of which appliances is exemplified in Letters Patent of the United States Nos. 1,058,356, 1,111,531, granted and issued to me under dates of April 8, 1913, September 22, 1914, and February 16, 1915, respectively.

The object of my present invention is to provide means whereby all the members of the mechanical stoker of a locomotive boiler furnace may be supported wholly on the locomotive, thereby dispensing with the rear supports therefor upon the tender which have been provided in constructions prior to my invention; facilitating the connection and disconnection of the locomotive, with and from the tender; and preventing breakage or injury of the parts in the event of the accidental disconnection of the two vehicles.

The improvement claimed is hereinafter fully set forth. In the accompanying drawings: Figure 1 is a vertical longitudinal central section through a mechanical stoker and through the rear water wall of the firebox of a locomotive engine and a portion of the tender on which it is applied, illustrating an application of my invention; and Fig. 2, a rear view of the apparatus, partly in section on the line *x x* of Fig. 1.

Referring to the drawings, my invention is herein exemplified in connection with a locomotive engine, (indicated as a whole by B), and a tender, (indicated as a whole by A), which are coupled together for service, in the ordinary manner, my invention being provided for the purpose of mechanically conveying fuel from the coal space, *a*, of the tender, to the firing door opening, *b'*, of the firebox, *b*, of the locomotive, and intermittently projecting apportioned quantities of fuel through said opening into the firebox.

The mechanical stoker proper, in connection with which my invention is herein shown as applied, is, in all substantial particulars, similar to that disclosed in my pending Letters Patent No. 1,128,428 afore-

said, and as it is not, in and of itself, claimed as of my present invention, and is fully described and shown in said Letters Patent, it will not be herein described in full detail, further than will be sufficient to make clear its relation to the supporting means of my present invention.

The mechanical stoker herein exemplified comprises the following principal members: A conveyer casing, 2, extends forwardly and upwardly from a point below the forward portion of the coal space, *a*, of the tender, A, to a vertical feed cylinder, 4, which is supported on and adjacent to the rear of the firebox, *b*, of the locomotive, and with which feed cylinder, slightly below its top, the upper end of the conveyer casing communicates. Fuel is forced through said conveyer casing, into the feed cylinder, by a plunger, 3, which is fitted to be reciprocated therein, and to which there is coupled a plurality of pushers or flaps, 3<sup>a</sup>, pivoted to links, 3<sup>b</sup>, extending longitudinally in the conveyer casing.

The feed cylinder, 4, is fitted with a piston, 4<sup>a</sup>, fixed upon a piston rod, 4<sup>b</sup>, and is open, at its top, to a shovel box, 9, from which charges of fuel which are delivered to it from the feed cylinder, by the piston, 4<sup>a</sup>, of the latter, are projected into the firebox by a pair of shovels, 11<sup>a</sup>, swinging about vertical axes in the shovel box.

The movements of the plunger, 3, of the conveyer casing, and of the piston, 4<sup>a</sup>, of the feed cylinder, are effected by the piston, 5<sup>a</sup>, of a vertical motor cylinder, 5, supported on the frame of the locomotive, below and adjacent to the feed cylinder, through the connections shown in Fig. 1, and the shovels, 11<sup>a</sup>, are swung about their axes by the pistons (not shown) of horizontal motor cylinders, 13, located above the motor cylinder, 5.

In all constructions of mechanical stokers known prior to my invention, which embody a conveyer for the transfer of fuel from the tender to the locomotive, the apparatus is, so far as my knowledge and information extend, supported, at its front end, on the locomotive and, at its rear end, on the tender, which method of support is subject to the objections, among others, of involving increased delay in connecting and disconnecting the locomotive and tender, and breakage of parts when the two vehicles are accidentally separated. These ob-

jections are entirely overcome, and the installation of accessory members on the tender minimized, by the application of my invention, in which the entire mechanical stoker proper is supported wholly on the locomotive and without positive connection to any part of the tender.

As shown in the drawings, the shovel box, the feed cylinder; the front end of the conveyer which is connected thereto, and the actuating motors, of the mechanical stoker above described, are all supported on the locomotive, adjacent to the back of the firebox thereof, and the rear end of the entire structure is also supported on the locomotive, this support being provided by a bracket, 2<sup>a</sup>, which is firmly secured to the framing of the locomotive, below the firing deck, and projects upwardly and rearwardly above the floor of the tender, A, and below the coal space, a, thereof, for such distance as may be sufficient to allow fuel to be delivered from the coal space into the conveyer casing, 2, adjacent to its rear end. The conveyer casing is not positively connected to any member of the tender, and is therefore exempt from liability to strain or breakage, either by reason of the relative movements of the locomotive and tender or by their separation, either designed or accidental.

It will be obvious that in order to enable the supply of fuel from the coal space of the tender to the conveyer casing to be maintained in the different relative positions of the locomotive and tender, without obstruction and without loss of fuel by the dropping thereof outside of the conveyer casing, it is only necessary that the opening in the top of the latter which receives the fuel, shall be made sufficiently larger than the opening in the floor of the coal space through which it is delivered, to enable the receiving opening in the conveyer casing to be, under all conditions of relative position of the two vehicles, below the entire area of the delivery opening in the floor of the coal space, and therefore that, while an intermediate self adjusting fuel conducting appliance may be desirable for preventing the escape of dust, etc., it is not, either structurally or operatively, essential in the operation of my invention. One form of such an intermediate self adjusting fuel conducting appliance, which is adapted to the conditions of practical service, is shown in the drawings and is of the following construction: An open bottomed fuel supply hopper, 1, is secured to the floor of the coal space of the tender, surrounding an opening therein through which the fuel is supplied by gravity to the hopper and thence to the rear portion of the conveyer casing. A sleeve, 1<sup>a</sup>, is formed on the bottom of the hopper, 1, and is fitted in a cor-

responding floating sleeve, 1<sup>b</sup>, having a horizontal flange, 1<sup>c</sup>, which is fitted to slide between a bearing on the top of an inlet nozzle, 2<sup>b</sup>, on the upper side of the conveyer casing, 2, and longitudinal cap plates, 2<sup>c</sup>, secured removably thereto. As shown in the drawings, the cap plates bear on the flange, 1<sup>c</sup>, on opposite sides and entirely clear of, the sleeve, 1<sup>b</sup>, and there consequently being no positive connection between the feed supply hopper and the conveyer casing, the separation of the locomotive from the tender has no tendency to injure or displace any of the parts. It will be seen that the construction described performs the function of a universal joint supply conduit, in permitting relative lateral, longitudinal, and vertical movements of the fuel hopper and conveyer casing when the same are in operative relation for service.

My invention is not limited to the embodiment of the specific construction of mechanical stoker proper herein described and shown, and any other known and preferred construction in which fuel is transferred through a conveyer casing, from a receptacle on a tender to means located on a locomotive for feeding it into a firebox, may be substituted therefor without departure from the spirit and operative principle of my invention, the leading and characteristic feature of novelty of which consists in the provision of a conveyer extending rearwardly from the locomotive sufficiently far for its inlet to be located on, and beneath the fuel storage space of a tender, whereby fuel may be directly delivered to it therefrom by gravity, and in means whereby the mechanical stoker proper is supported entirely upon the locomotive.

I claim as my invention and desire to secure by Letters Patent:

1. The combination, with a locomotive, of a mechanical stoker having a conveyer casing which projects rearwardly from the locomotive sufficiently far for its inlet to be positioned, when in service beneath the fuel storage space of a tender so as to allow independence of motion between the locomotive and tender, and means for supporting the stoker structure, including said conveyer casing, wholly upon the locomotive.

2. The combination, with a locomotive, of a mechanical stoker having a conveyer casing which projects rearwardly from the locomotive sufficiently far for its inlet to be positioned, when in service beneath the fuel storage space of a tender, so as to allow independence of motion between the locomotive and tender, and an upwardly and rearwardly extending bracket, fixed to the framing of the locomotive and supporting the rear end of the conveyer casing.

3. The combination, with a locomotive, of a mechanical stoker having a conveyer cas-

ing which projects rearwardly from the locomotive sufficiently far for its inlet to be positioned, when in service beneath the fuel storage space of a tender, an upwardly and rearwardly extending bracket fixed to the framing of the locomotive and supporting the rear end of the conveyer casing, and a universal joint supply conduit interposed between the fuel storage space of a tender and the conveyer casing, and free from positive connection with said casing.

4. A mechanical stoker for locomotives, comprising a fuel receptacle, means for feeding fuel therefrom to a locomotive firebox, a conveyer mechanism having a casing leading to a connection with the fuel receptacle and extending rearwardly from the locomotive sufficiently far for its inlet to be positioned, when in service beneath the fuel storage space of a tender so as to allow independence of motion between the locomotive and tender, and means for supporting the stoker structure, including the conveyer casing, wholly upon the locomotive to which it is applied.

5. A mechanical stoker for locomotives, comprising a fuel receptacle, means for feeding fuel therefrom to a locomotive firebox, a conveyer mechanism having a casing leading to a connection with the fuel receptacle

and extending rearwardly from the locomotive sufficiently far for its inlet to be positioned, when in service beneath the fuel storage space of a tender so as to allow independence of motion between the locomotive and tender, and an upwardly and rearwardly extending bracket fixed to the framing of the locomotive and supporting the rear end of the conveyer casing.

6. A mechanical stoker for locomotives, having a conveyer casing extending rearwardly sufficiently far to be positioned, when in service, beneath, and receive fuel from, the fuel storage space of a tender, and provided with an upwardly extending inlet nozzle adjacent to its rear end, in combination with an upwardly and rearwardly extending bracket fixed to the framing of a locomotive and supporting its rear end, a supply hopper communicating with the fuel storage space of a tender, a floating sleeve fitted on said hopper, and connections coupling said sleeve to the inlet nozzle of the conveyer casing, without restriction of free longitudinal movement of said casing.

ALBERT G. ELVIN.

Witnesses:

EMILY L. MYERS,  
A. I. DEWNELLEY.