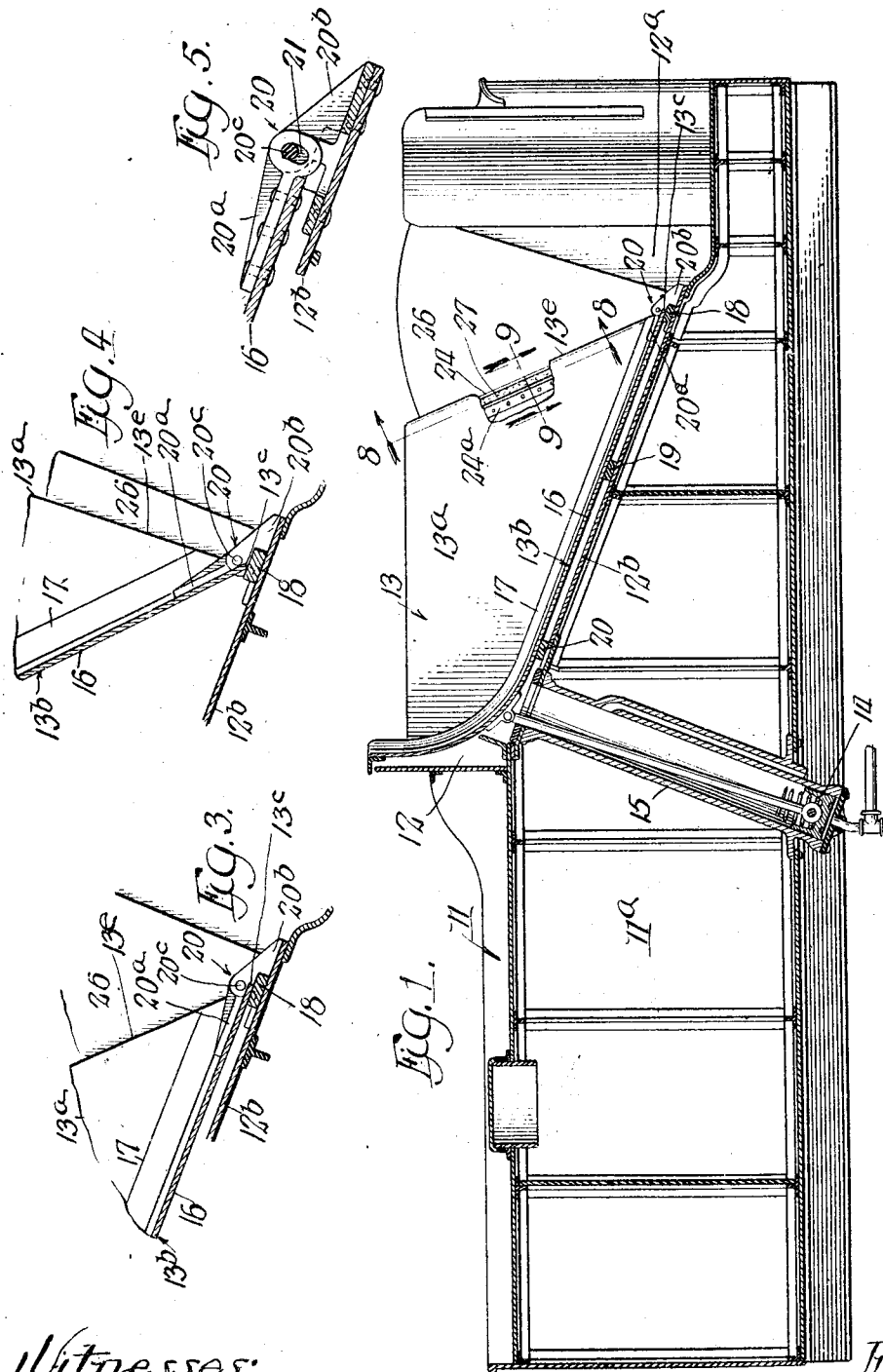


E. RYAN.
TENDER FOR ENGINES.
APPLICATION FILED NOV. 27, 1911.

1,051,639.

Patented Jan. 28, 1913.

2 SHEETS—SHEET 1.



Witnesses:
J. H. Huggins
J. Q. Wilkins

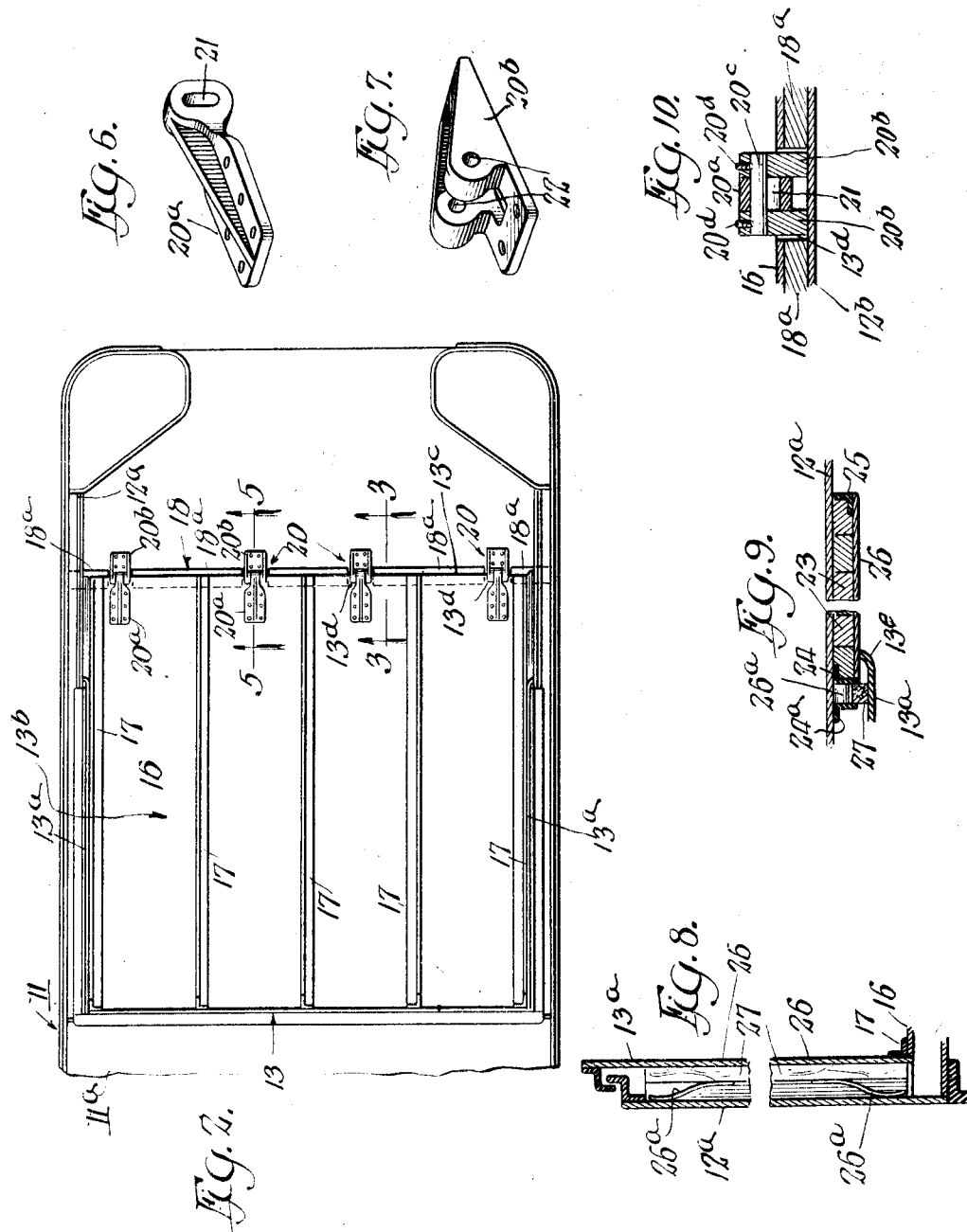
Inventor:
Edward Ryan
by Pool & Brown Attys

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Witnesses:
T. H. Alfude
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UNITED STATES PATENT OFFICE.

EDWARD RYAN, OF CHICAGO, ILLINOIS.

TENDER FOR ENGINES.

1,051,639.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed November 27, 1911. Serial No. 692,580.

To all whom it may concern:

Be it known that I, EDWARD RYAN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tenders for Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to locomotive tenders of the kind having a coal pit which is provided with an inclined bottom or rear wall or provided with a hopper having an inclined rear or bottom wall,—the inclined wall in the one case and the hopper as a whole in the other case being hinged to the bottom wall of the coal pit so that it may be agitated or swung in such a manner as to cause the coal to travel forwardly into a position at or near the forward end of the coal pit where the fireman may reach it, preferably, without leaving the engine cab. Tenders of the kind described, are shown in Letters Patent No. 675,795, dated June 4, 1901, and No. 904,017, dated November 14, 1908, both granted to Edgar Ryan and Oscar Johnson.

As shown herein, the invention is applied to a tender provided with a coal pit within which is located a hopper having side walls and an inclined bottom and rear wall which hopper has its bottom wall connected at its forward end by hinges to the bottom wall of the coal pit, as shown in the second patent named above.

The invention relates particularly to the means for hinging the inclined wall or the hopper to the bottom wall of the coal pit, and consists of the matters hereinafter described and more especially pointed out in the appended claims.

In the tenders of the kind described, the hinged connection between the swinging member and the bottom wall of the pit to which it is attached has been made by means of ordinary hinges. The pintles of the hinges in this case act as the fulcrum on which the swinging member is swung. As is readily apparent, by reason of the great weight of coal supported by the swinging member, enormous downward strain is thus put upon the said pintles which results in their frequent breakage or distortion so as

to interfere with the proper or continuous operation of the swinging member. In addition lumps of coal are apt to fall between the swinging member and the bottom wall of the coal pit, and when the swinging member is raised, said lumps find their way to a position near the hinges and become lodged there. Then when the swinging member is lowered to its initial position, they are compressed between it and the bottom wall of the pit and if not readily crushed, on account of their resistance to the crushing strain, act as fulcrums to raise the forward end of the swinging member and force it away from the bottom wall of the pit to which it is hinged. This exerts an upward force on the pintles of the hinges tending to break or deform them.

The main object of my present invention is to provide a means for hinging the swinging member to the bottom wall of the coal pit such as to obviate these difficulties.

Another feature of the invention embraces a novel means for preventing coal from entering between the side wall of the hopper and the side wall of the coal pit during the operation of the swinging hopper.

In the drawings—Figure 1 is a view representing a longitudinal central section 85 through a tender of the kind described, showing the hopper hinged to the bottom wall of the coal pit in accordance with my invention; Fig. 2 is a view representing a partial top plan view of the tender; Fig. 3 is a view representing a partial detail section on an enlarged scale, through Fig. 2 in a plane indicated by the line 3—3 thereof; Fig. 4 is a similar section to that shown in Fig. 3 with the hopper shown swung in an elevated position; Fig. 5 is a detail sectional view of one of the hinges on a still larger scale, the plane of the section being indicated by the line 5—5 of Fig. 2; Figs. 6 and 7 are respective views of the leaves of the hinge; Fig. 8 is a view representing a section through Fig. 1 on the line 8—8 thereof; Fig. 9 is a partial section in a plane indicated by the line 9—9 of Fig. 1; Fig. 10 is a view representing a transverse section through one of the hinges and the adjacent parts in the plane of the pintle of the hinge.

Referring now to that embodiment of my invention shown in the drawings: 11 indicates the tender as a whole, the same embracing a water tank 11^a and a coal pit located at its forward end. Said coal pit

is open in front and has side walls 12^a, 12^b, and a downwardly and forwardly inclined bottom wall 12^b. In the coal pit is located a hopper 13 open at the front and adapted to fit within the coal pit. Said hopper has side walls 13^a, 13^b, adapted for sliding movement with reference to the side walls of the coal pit, and a downwardly and forwardly inclined bottom wall 13^b adapted to rest upon the bottom wall of said coal pit. The bottom wall of the hopper is connected at its forward edge by means of hinges 20 as will presently be described, so that the hopper as a whole is capable of forward swinging movement about said forward edge. Swinging movement is imparted to the hopper when desired, by means of a reciprocatory plunger 14 operating in a cylinder 15 and adapted to be actuated by compressed steam or other fluid controlled by means located in the cab of the engine conveniently to the hand of the fireman. The controlling and operating means may be such as described in the patents heretofore referred to, and as said means forms no part of the present invention, a further description of it will be unnecessary.

The bottom wall 13^b of the hopper consists of a metal plate or sheet 16 and of spaced parallel longitudinally extending angle bars 17, which are rigidly secured to said plate 16 by rivets or otherwise. The side walls of the hopper consist of plates or sheets of metal rigidly secured to the outermost angle bars 17. The bottom wall of the hopper does not rest directly on the bottom wall 12^b of the coal pit but on transversely extending plates 18, 19 and 19^a, secured to the top surface of said bottom wall; the plate 18 being located beneath the forward end of the hopper, the plate 19^a near its rear end and the plate 19 at a point spaced between the first two named plates. As shown, the plate 18 does not extend continuously across the bottom wall of the coal pit, but comprises a series of shorter plates 18^a, arranged end to end with their adjacent ends spaced apart to provide room for the hinges 20.

The hinges 20 are of such construction that while they will hold the hopper against forward or backward longitudinal movement in the bottom wall of the coal pit, they will at the same time allow a limited flexibility of movement between the leaf of the hinge connected at the bottom wall of the coal pit and the leaf connected to the bottom wall of the hopper, in a direction substantially at right angles to said bottom wall. As shown herein, said hinges each comprise a leaf 20^a rigidly secured at the forward end of the bottom wall 13^b of the hopper; a leaf 20^b rigidly secured to the bottom wall 12^b of the coal pit intermediate the adjacent ends of the bars 18^a; and a pintle 20^c which en-

gages in suitable apertures formed in the hinge leaves and connects them together. As shown herein, the aperture 21 in the leaf 20^a is elongated in a direction at right angles to the plane of the hinge when open, as clearly appears in Figs. 5 and 6. The apertures 22 in the leaf 20^b are of a diameter to receive the pintle snugly, which is preferably rigidly secured therein by means of set screws 20^d. (See Fig. 10). The front end 13^c of the hopper bottom wall terminates in a line intermediate the lateral edges of the plate 18 and extends preferably to a line vertically below the pintles of the hinges except at the hinges where notches 13^d are formed to receive the enlarged slot bearing parts 21^a of the leaves 20^a.

The operation is as follows: When the hopper is raised to cause the coal to travel toward the front of the coal pit, the forward end of its bottom wall bearing on the plate 18, acts as a fulcrum about which the hopper, as a whole, is swung. (See Fig. 4.) The sole function of the hinges during this movement is to prevent the hopper from sliding longitudinally forward on the bottom wall of the coal pit, and the slot in the leaf connected to the hopper, permits said leaf to move with reference to the pintle of the hinge, so that the pintle will not resist this movement. The weight of the hopper and of the coal contained in it instead of coming on the pintles of the hinges is exerted by the forward end of the bottom wall of the hopper on the bar 18. This prevents strain on the hinge pintles and thus obviates the breaking of the connection at the hinges. In addition, should a lump or lumps of coal, when the hopper is raised, fall between the bottom wall of the hopper and the bottom wall of the coal pit and come to lodge adjacent the hinges, even if said lump or lumps were not crushed by the weight of the hopper in its descent, their resistance to the crushing strain acting to lift the front end of the hopper would result in no damage to or breaking of the hinge connection, since the play allowed between the leaves of the hinge would readily permit the one member of the hinge attached to the bottom wall of the hopper to rise with reference to the other member attached to the bottom wall of the coal pit without placing any strain on the hinge pintles.

In order to prevent coal from entering between the side walls of the hopper and the side walls of the coal pit along the forward edges of said side walls of the hopper, the following construction is provided. The plates comprising said side-walls 13^a of the hopper are curved outwardly at their forward edge toward the side wall 12^a of the coal pit at 13^a. Covering each side wall of the coal pit throughout a space slightly

larger than the segment through which the forward edge 13° of the hopper side wall is adapted to swing, is located a filler consisting of angle bars 24, 25 arranged to in-
 5 close the segment of a circle with the center substantially coincident with the axes of the hinges and between which are placed filler blocks 23 which are covered by a segmental plate 26. A third angle bar 24^a is arranged
 10 parallel to and spaced from the angle bar 24 to form a slot or way in which is located a strip preferably of wood, 27, adapted to engage with the side wall of the hopper. Said strip is held in engagement with said
 15 side wall by means of springs 26^a which act between the bottom of said strip and the side wall of the coal pit so as to hold said strip yieldingly in engagement with the side wall of the hopper. This construction prevents
 20 any coal from passing between the side wall of the hopper and the side wall of the coal pit.

I claim as my invention—

1. In an engine tender of the kind de-
 25 scribed, in combination with a coal pit located therein, a swinging inclined member adapted to agitate the coal in the pit to feed it toward its forward end, said swinging member resting at its forward end on the
 30 bottom wall of the coal pit and being adapted to be swung on the bottom wall of said pit about said forward end as an axis, and means for hinging said swinging member
 35 to the bottom wall of said coal pit, said means providing a limited movement between the forward end of said swinging member and the bottom wall of the coal pit in a direction at right angles to the latter.

2. In an engine tender of the kind de-
 40 scribed, in combination with a coal pit located therein, a swinging hopper having side walls and an inclined bottom wall located within said coal pit, the forward end of the bottom wall of said swinging hopper

resting on the bottom wall of the coal pit, said
 45 hopper being adapted to be swung about said forward end of its bottom wall as an axis on the bottom wall of said coal pit, hinge mem-
 50 bers for hinging said swinging hopper to the bottom wall of said coal pit, said hinges being constructed to provide movement between the forward end of said swinging hopper and the bottom wall of the coal pit in a direction at right angles to the latter.

3. In an engine tender of the kind de-
 55 scribed, in combination with a coal pit located therein, a swinging inclined member adapted to agitate the coal in the pit to feed it toward its forward end, a transverse plate secured to the bottom wall of said coal pit,
 60 said swinging member resting at its forward end on said transverse plate and being adapted to be swung on said plate about its forward end as an axis, and means for
 65 hinging said swinging member to the bottom wall of said coal pit, said means providing a limited movement between the forward end of said swinging member and the bottom wall of the coal pit in a direction at
 70 right angles to the latter.

4. In an engine tender of the kind de-
 75 scribed, having a coal pit with side and bottom walls, a hopper having bottom and side walls, means providing a hinge connection between the bottom wall of said hopper and
 80 the bottom wall of said coal pit, and yielding filler members interposed between the side walls of said hopper and the side walls of said coal pit.

In testimony, that I, claim the foregoing
 as my invention I affix my signature in the
 presence of two witnesses, this 24th day of
 November A. D. 1911.

EDWARD RYAN.

Witnesses:
 GEO. R. WILKINS,
 T. H. ALFREDS.