(No Model.)

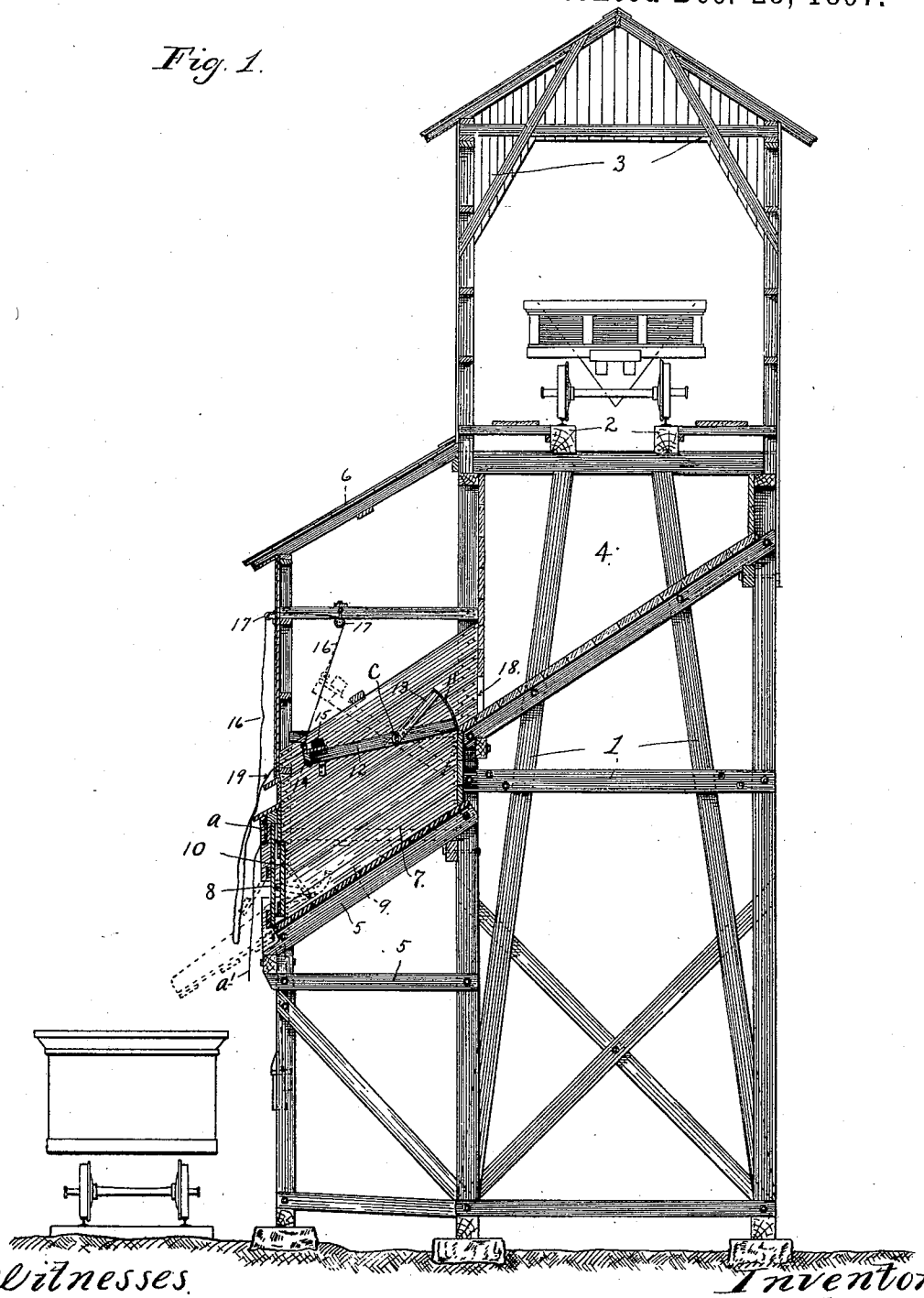
2 Sheets—Sheet 1.

T. APPLETON.

COALING STATION.

No. 596,133. Patented Dec. 28, 1897.

Fig. 1.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

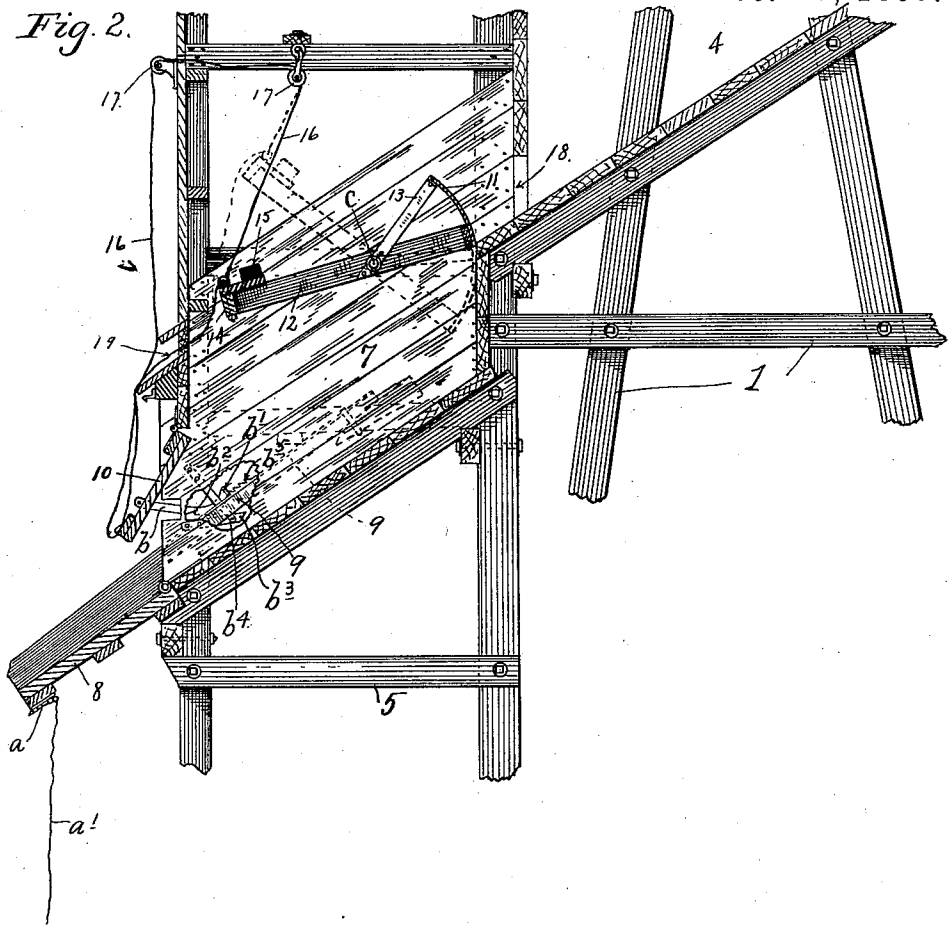
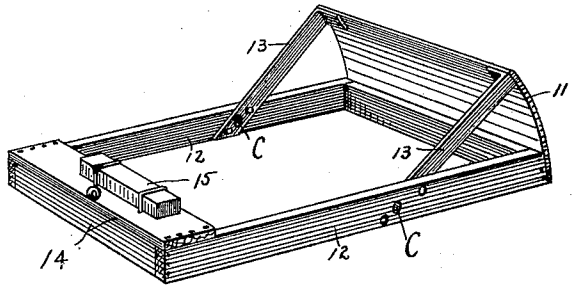


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS APPLETON, OF ST. PAUL, MINNESOTA.

COALING-STATION.

SPECIFICATION forming part of Letters Patent No. 596,133, dated December 28, 1897.

Application filed April 6, 1897. Serial No. 630,973. (No model.)

To all whom it may concern:

Be it known that I, THOMAS APPLETON, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Coaling-Stations; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to coaling-stations, and has for its object to improve the same with a view of increased convenience and economy in handling coal.

The invention is especially designed for coaling-stations on railway-lines for loading locomotive-tenders, but is generally applicable wherever the corresponding functions are required.

My invention is illustrated in the accompanying drawings, wherein like notations refer to like parts throughout the several views.

Figure 1 is a vertical section through a coaling-station equipped with my improvements, the locomotive-tender being shown in loading position in diagram lines only and the apron of the delivery-pocket being shown in its raised or closed position. Fig. 2 is a corresponding section through the coal-chute shown in Fig. 1 with some parts broken away, the apron of the delivery-pocket being shown in its lowered or open position. Fig. 3 is a perspective view of my improved controlling-gate detached.

The numeral 1 represents a suitable framework or trussed structure adapted to support an elevated track 2 and usually provided with a suitable housing or cover 3 directly over the storage bunkers or bins.

According to my improvement the track 2 is at a greater height than usual in such stations, and directly underneath the same I provide a storage bin or bunker 4 of large capacity. This storage bin or bunker 4 is provided with an inclined floor and, as shown, extends the entire length of the housed structure. Between the main framework 1 and the railway-track and attached directly to the main framework is a supplementary framework 5, covered by a suitable roof 6, and supporting a series of delivery or loading pockets 7. These delivery-pockets 7 have inclined floors which, instead of being in the same plane as the inclined floor of the storage-bin, are set on a jog or offset downward, so as to bring the same to a lower level than the bin, as clearly shown in Figs. 1 and 2. Of the said delivery-pockets 7 a series are usually provided at every station in order to have ready for the locomotives charges or loads of different quantities, as may be needed.

The elevated storage-bin 4 under my improved plan extends the entire length of the whole series of pockets 7 and has a capacity greater than the aggregate capacity of the series of pockets. The said pockets 7 are usually made of the same capacity throughout the series, but are charged with different amounts of coal for the purposes above named, and the charges contained in the several pockets are usually indicated by suitable markers on the track side, so as to enable the fireman of the locomotive to select a pocket containing the quantity needed. These delivery-pockets 7 are provided with suitable dumping or loading devices for delivering the entire charge contained therein to the locomotive-tender. Of said dumping devices the Burnett and Clifton apron and retaining-gate is a favorite type and is the form illustrated in the drawings. As said dumping devices for the delivery-pockets 7 are well known, forming no part of my present invention, it will be sufficient to very briefly note the same. The aprons 8 are hinged to the lower ends of the pocket-floors and are carried by counterbalancing-arms 9. When the said aprons are down, they form a continuation of the floor of the pocket, and when up they cooperate with a top hinged retaining-gate 10 to form the outer end or delivery-wall of the pocket. The aprons 8 are provided with spring-latches a, which engage with suitable catches to hold the aprons in their raised position and provided with a flexible connection a' for releasing the same, as shown in Fig. 1.

The retaining-gates 10 are provided with pivoted arms b, which serve as latches for holding the gate in its open or closed position. For this purpose the said latch-arms b have angular ends or extensions b', which engage with teeth b^5 on the apron-arms 9 when the apron is down to hold the gate 10

in its open position, as shown in Fig. 2, and with notches b^2, which engage with suitable catches b^3, shown as formed on their guide-brackets b^4, for holding the said gates 10 in their closed position, as shown in Fig. 1. When the apron 8 is lowered to nearly loading position, the arms 9 strike the angular ends b' of the gate-latches b and release said latches from the catches b^3, thereby permitting the parts to assume the position shown in Fig. 2 under the weight of the coal moving out from the pockets. When the parts are brought into the position shown in Fig. 2, the angular ends b' of the latches b will engage with the teeth b^5 on the apron-arms 9, thereby holding the gate 10 open until the charge is dumped. When the apron is raised, the teeth b^5 on said arms 9 will of course recede from the latches b, thereby permitting the gate 10 to close by gravity, so as to bring the parts back into the position shown in Fig. 1, with the gate 10 locked in its closed position. The retaining-gate 10 is therefore entirely automatic in its action under the control of the apron 8.

For the purpose of a quick delivery in the loading action it is very desirable that the coal should be banked against the outer or delivery wall of the pocket, so as to insure a quick and free flowage of the coal from the pocket when the apron is lowered over the tender.

In practice it has been found that if the floor of the delivery-pocket be in the same plane as the floor of the storage-bin the coal will not bank or accumulate against the delivery-wall of the pocket, but will lie spread out in a nearly uniform stream for the whole length of the floor, with the effect of taking much longer to load the tender and often requiring shoveling or scraping to secure the delivery of the same from the chute. To overcome this defect, I bring the storage-bin 4 and the delivery-pocket 7 into the offset or staggered relation to each other, as described. In virtue of the jog or drop thus secured between the storage-bin 4 and the delivery-pocket 7 a cascade action will be produced on the moving stream of coal as it flows from the storage-bin into the pocket, which will have the effect of causing the coal to accumulate or bank against the outer or delivery wall of the pocket, as desired. Otherwise stated, in virtue of this feature of my improvement the whole charge in any given pocket will lie banked up at the lower corner of the pocket with its weight taken largely on the gate 10. Hence as quick as the apron 8 is lowered into loading position and the gate 10 is unlocked, as shown in Fig. 2, the whole charge of coal will instantly drop into the locomotive-tender. This results in a large saving of time.

As another feature of my invention I provide an improved cut-off gate for controlling the charge to be delivered from the storage-bin 4 into any given delivery-pocket 7. As shown, the head or body 11 of my improved cut-off gate is of segmental form and is carried by arms 12 and braces 13. The arms 12 are shown as connected at their outer ends by cross bar or bars 14, on which is mounted a suitable load or weight 15 for counterbalancing the gate when in working position. This cut-off gate is mounted, as shown in Figs. 1 and 2, with its fulcrum or pivotal center outward of the floor of the storage-bin and above the plane of the floor of said bin. The load or weight 15 tends to hold the cut-off gate in its uppermost or closed position, as shown in Fig. 1, but by suitable connections 16, running over suitable guide-sheaves 17, the said gate can be thrown into the position shown in dotted lines in Figs. 1 and 2, so as not to obstruct the outlet from the storage-bin. The said outlet from the storage-bin is shown at 18 in Figs. 1 and 2 and the gate-segment 11 is of the proper dimensions to extend upward sufficiently far to obstruct the flowage through said opening. For this purpose it is not necessary that the gate should work directly adjacent to said opening 18, but may be at a point farther outward, as shown, if the chord of the gate-segment is of sufficient length to bring the upper edge of the gate above the upper edge of said opening 18 when the gate is in its closed position. By actual usage it has been demonstrated that such a gate so applied will block the flowage through the opening 18 when in its closed position. By noting the construction of this cut-off gate it will be seen that when the gate-segment 11 is in its open position, as shown in dotted lines in Figs. 1 and 2, the coal from the storage-bin 4 is delivered over the head of the gate and between the arms thereof into the delivery-pocket 7. The gate therefore forms no part of the guideway for the coal when being delivered from the storage-bin into the pocket, and hence no joints for leakage and no obstruction to the flowage is caused by the cut-off gate. In the closing action of said cut-off gate it will be noted that the gate-segment moves upward through the stream of flowing coal, and hence its closing movement cannot be blocked by the coal. There is no base of resistance against which the coal can be abutted by the gate in its closing movement, but as the gate moves upward and outward on the arc of the circle any chunks of coal which may be in its path will simply be thrown upward and outward by the gate into the pocket. The gate therefore may be relied upon to always effect the cut-off for the reason that, as above stated, it will not be blocked in its closing movement. The load or weight 15 on the gate-arms 12 is supposed to be sufficient to insure the automatic closing of the gate, but if for any reason the gate should get stuck the same may be positively pulled into its closed position by the flexible connection 19, which is shown as extending to the outside of the pocket and joining with the connection 16, that is used for opening the gate.

In virtue of the relation between the storage-bin 4 and the delivery-pocket 7, in combination with a suitable cut-off gate for controlling the opening or outlet 18 from the bin to the pocket, it is obvious that the delivery-pocket may be charged with any desired amount of coal, either up to any part or to the whole of the pocket's capacity at the will of the operator.

The loaded cars may be brought into unloading position over the elevated storage-bin 4 on the track 2 in any suitable way. In some instances the grade of the approach or inclined section of the track is sufficiently low to permit the loaded cars to be pushed up by a switch-engine. Generally, however, and especially with my improved station, which requires the track to be at a higher than usual level, it is found more desirable to use a short approach with a steeper grade and to pull the loaded cars into unloading position over the storage-bin 4 by means of a suitable stationary engine and cable (not shown) located at the coaling-station.

As the elevated storage-bin 4 is directly under the loaded cars when in unloading position and extends the entire length of the entire series of delivery-pockets 7 it is obvious that the cars may be unloaded without shoveling direcly into the storage-bin. As the supply from the storage-bin to the pockets is controlled by the cut-off gates it is a matter of indifference in unloading the cars whether or not the pockets contain any coal. Otherwise stated, the unloading of the coal for stocking the coaling-station is entirely independent of the condition of the pocket. This of course is a great advantage. Likewise, it is obvious that the charging of the pockets is in no manner dependent upon the load in the car. It is equally apparent that no shoveling is required at any point in the handling of the coal and that the loading of the tenders or other receptacles from the delivery-pockets can be done in a minimum of time.

I wish it understood that I do not limit either of the two features of my invention by the other. In other words, the elevated storage-bin, with the delivery-pockets offset to a lower level, is of value regardless of the form of the cut-off gate and my improved cut-off gate is of value even if the delivery-pockets herein shown were dispensed with altogether. For example, the storage-bin 4 and my improved cut-off gate for controlling the outlet therefrom would be of service for loading directly from the storage-bin without the use of the pockets. In that case small cars might be substituted for the pockets, or the coal might be delivered directly into the tenders, other cars, coal-wagons, or receptacles of any kind that might be used for the distribution or transportation of the coal to the point desired. The improved cut-off gate herein shown, however, is especially well adapted to my improved coal-chute, having the break or jog between the storage-bin 4 and the delivery-pocket, and there is a peculiar and important coöperation between said two devices, as is obvious from the foregoing description. The break or offset in the coal-chute forms a pocket, into which the segmental portion 11 of the cut-off device is adapted to fall when the cut-off gate is opened by downward movement. In virtue of this construction the coal-chute is not necessarily cut away or slotted to permit of the downward movement therethrough of the cut-off gate, as is ordinarily the case in other constructions with which I am familiar. My improved construction leaves the coal-chute without any leakage-passages through which the fine particles of coal or coal-dust may escape. It will be further understood that the action of said improved cut-off gate is not necessarily dependent on the outwardly-extended arms and the counterbalancing-weight. It could be readily operated with a positive action in both directions.

The materials used for the gate and for the pocket may be of any suitable kind.

It will also be understood that minor details of construction might be changed without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is as follows:

In a coal-chute, the combination with a bin or pocket having an inclined floor, of a regulating or cut-off gate controlling the outlet therefrom, which gate is a pivoted segment with a skeleton frame and so mounted as to close upward through the stream of flowing coal, to effect the cut-off, and so that when below the stream of coal, the latter may flow through said skeleton frame.

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

THOMAS APPLETON.

Witnesses:
F. D. MERCHANT,
B. B. NELSON.