C. S. FARRER.

FEED GATE FOR SLATE PICKING MACHINES.

APPLICATION FILED APR. 19, 1913.

1,068,117.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

Fig. 1

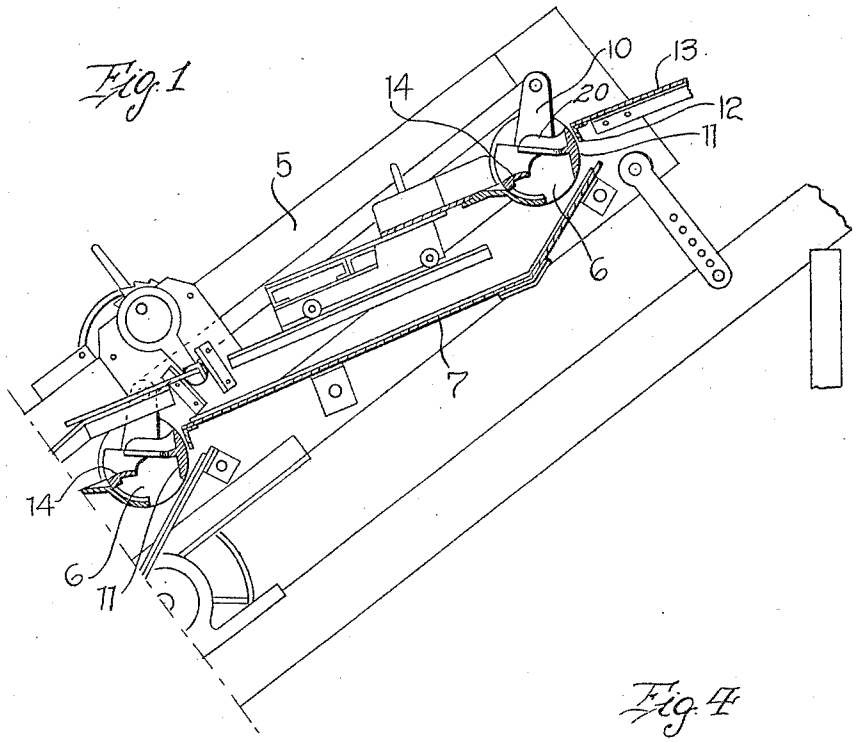


Fig. 4

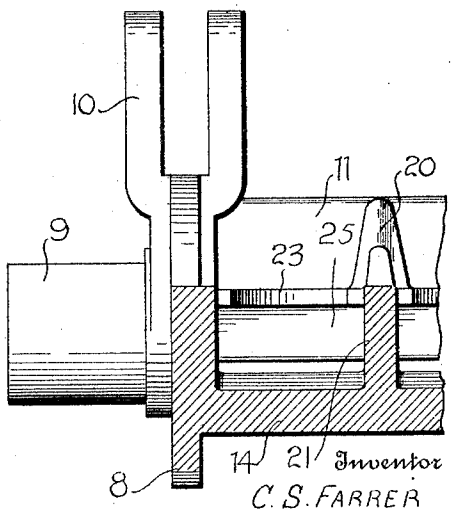
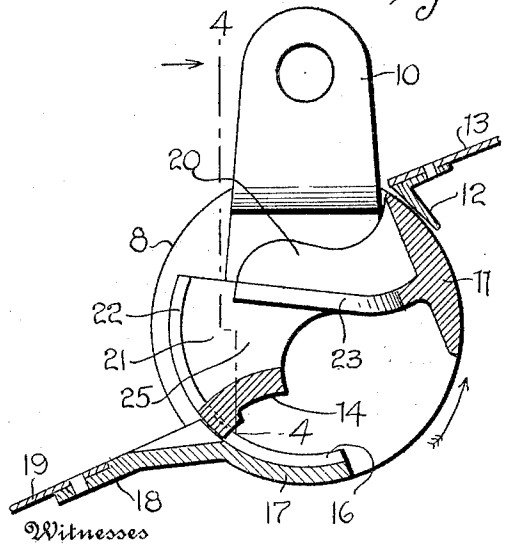


Fig. 2



Witnesses

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Fig. 3

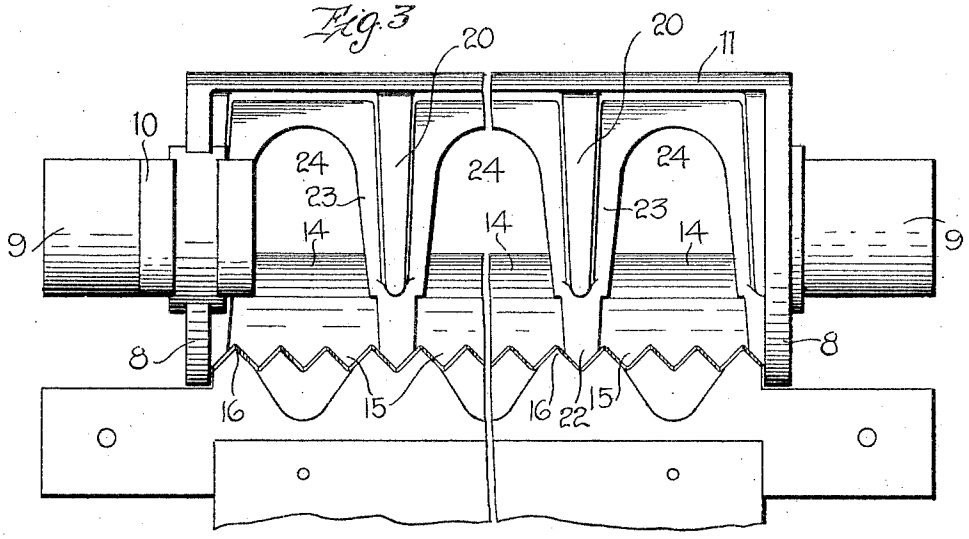


Fig. 5

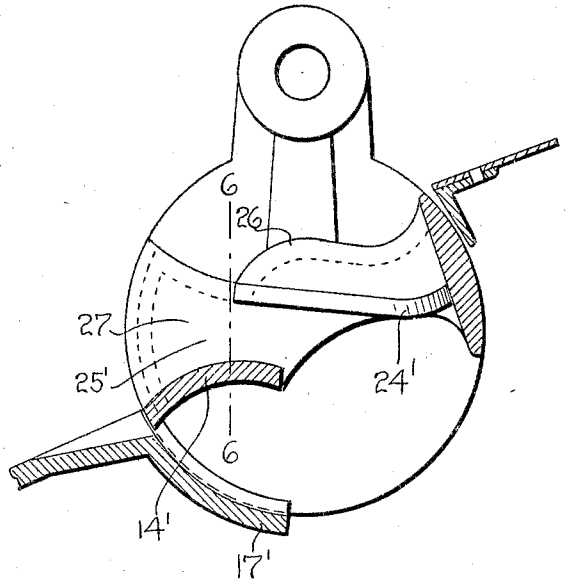
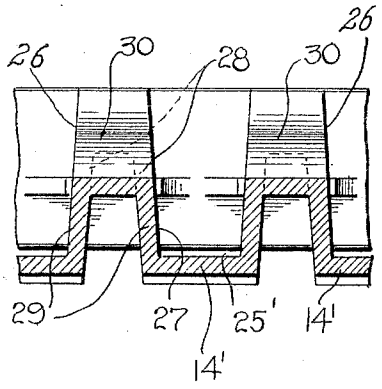


Fig. 6



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FEED-GATE FOR SLATE-PICKING MACHINES.

1,068,117. Specification of Letters Patent. Patented July 22, 1913.

Application filed April 19, 1913. Serial No. 762,430.

To all whom it may concern:

Be it known that I, CHARLES S. FARRER, citizen of the United States, residing at Dunmore, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Feed-Gates for Slate-Picking Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to feed gates for slate picking machines, and has for its primary object to generally improve the construction and increase the efficiency of gates of this character, such for instance as are illustrated in Patent Number 975,320 granted to me May 10, 1910, and my prior Patent Number 1,058,854, issued April 15, 1913.

The present invention broadly considered involves a combined feeding, separating and sizing gate for the coal and slate, the primary object of the invention residing in a gate construction whereby these several ends are successfully accomplished without appreciably interrupting the continuous movement of the coal and slate through the machine.

The invention has for another object an improved gate construction designed for use in gravity slate picking machines, said gate relating to that general class known as "oscillating gates" and having certain structural features whereby the coal is delivered therefrom in the movement of the gate in one direction while the slate is delivered in the movement of the gate in the opposite directions, thus separating the coal and slate into separate and distinct streams for gravity movement over the floor of the machine.

The invention further involves what may be termed a semi-open gate structure whereby the relatively small particles of slate and coal fall through the gate upon a lower inclined floor over which they move to a second gate to be further graded, while the remaining larger particles of coal and slate are alternately discharged or delivered from the gate in its oscillating movement.

A still further object of the invention is to produce a gate structure of the above character which will not add materially to the cost of manufacture of the machines disclosed in my prior applications, and which will be highly durable, efficient and reliable in practical operation.

With the above and other objects in view as will become apparent as the description proceeds, the invention consists in certain constructions, combinations and arrangements of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a longitudinal section of a portion of a slate picking machine provided with my improved combination separating and screening gates; Fig. 2 is an enlarged vertical section through the gate; Fig. 3 is a top plan view thereof partly broken away; Fig. 4 is a section taken on the line 4—4 of Fig. 2; Fig. 5 is a vertical section similar to Fig. 2 showing a slightly modified construction; and Fig. 6 is a section taken on the line 6—6 of Fig. 5.

Referring in detail to the drawings, and more particularly to Fig. 1 thereof, wherein I have illustrated a portion of the machine which is shown and described in detail in my prior Patent 1,058,854, 5 designates the frame of the machine in which the spaced separating and screening gates 6 which form the subject matter of the present invention are mounted. An inclined floor or chute 7 is arranged in the frame of the machine between the gates and over this floor the smaller particles of slate and coal which pass through the semi-open upper gate 6 are directed to the lower gate to be separated and again sized.

Having thus disclosed the general arrangement and mounting of the gates in the machine, I will now proceed with the detail description of the gate structure. In the preferred embodiment of the invention, each gate consists of the circular heads 8 with each of which a journal or trunnion 9 is integrally formed. One of the heads is also further provided with a radially extending arm 10 to which the operating means of any preferred type is connected. The circular head plates 8 are integrally connected upon one side of the rotative axis of the gate and at the periphery of said heads by a feed stop plate 11. This plate has a convex outer surface which is flush with the peripheries of the heads and is disposed in juxtaposition and movable relative to the transverse angle bar 12 which is fixed to the under side of the inclined feed plate 13, over which the coal and slate is fed to the gate. The circular heads 8 are further connected by what

is termed a "floor" 14. This floor is transversely curved and is disposed between the heads 8 at a point approximately diametrically opposite the feed stop plate 11. This floor is of appreciably less width than the radius of the gate and terminates at its outer longitudinal edge in spaced relation to the periphery of the gate heads while the inner edge of said floor is spaced from the axial center of the gate and below the same. The outer edge of this floor 14 is provided with teeth 15. The spaces between these teeth receive the teeth 16 formed upon a curved plate 17 which is disposed in concentric relation to the gate heads and between the same. This curved plate is formed with a lateral extension 18 which is riveted or otherwise secured to the inclined directing plate 19 mounted in the frame of the machine.

For convenience in describing the gate structure, that portion of the gate including the floor 14 may be referred to as the forward lower portion thereof while the feed stop plate 11 on the opposite side of the rotative axis of the gate constitutes the rear portion. A rib 20 is integrally formed upon the inner face of the feed stop plate 11, said rib being of substantially V shaped form in cross section and extending forwardly above and beyond the center of the gate. The upper edge of the rib is preferably curved or convex so that friction is reduced to a minimum and the coal will move freely thereover. Each of these ribs is integrally connected to the floor 14 by means of a partition wall 21, the outer edge of which is concentrically curved with relation to the gate heads and is provided with a single tooth 22 to coöperate with the teeth upon the plate 17. At the juncture of the upper inner portion of each partition wall with the lower edges of the ribs 20, a relatively narrow curved horizontally disposed web 23 is integrally formed, the medial portion of said web being integral with the inner face of the stop plate 11. An opening 24 is thus defined by the edge of this web and the inner longitudinal edge of the floor 14 through which the relatively small particles of coal and slate fall upon the lower inclined floor 7. It is to be understood that the several gates 6 mounted in the machine will be provided with the webs 23 of relatively different widths so that the openings 24 will vary in area whereby the coal and slate are properly sized as the same passes over the several gates. The spaces between the partition walls 21 constitute pockets 25 in which the flat pieces of slate are received.

In the operation of the above described form of my invention, the mixed coal and slate is fed over the plate 13 to the gate. The smaller particles of coal and slate fall through the openings 24 and through the space between the rear edge of the plate 17 and the lower edge of the stop plate 11, and gravitate downwardly upon the inclined plate 7 to the next gate. The remaining or larger particles of coal and slate are held between the ribs 20 or upon the same, the flat thin pieces of slate standing on edge upon the floor 14 in the pockets 25. In the illustrated position of the gate shown in Fig. 2, the same is receiving the coal and slate and is at the limit of its movement in one direction. In the continued operation of the gate, the same moves in the direction indicated by the arrow, the plate 11 moving upwardly and forwardly to cut off the feed of the coal and slate while the floor 14 moves downwardly and rearwardly over the toothed plate 17. In this movement of the gate, the large round particles of coal which are held thereon by the ribs 20 are projected forwardly over the gate and upon the plate 19, from which they are discharged in any approved or well known manner. In the reverse oscillating movement of the gate, the floor 14 moves forwardly and upwardly and the particles of slate held in the pockets 25 slide downwardly over the convex upper surface of said floor and are discharged upon the plate 19. By providing the teeth 15 and 16 upon the floor 14 and plate 17 respectively, liability of these slate particles wedging between the movable floor and the stationary plate is obviated and their proper discharge from the gate assured. It will thus be seen that the coal and slate is alternately discharged from the gate and moves in separate streams over the inclined plate 19. In the downward and rearward movement of the floor 14, such particles of slate and coal as may lodge upon the plate 17 will be moved rearwardly and discharged over the rear edge of the plate 17 upon the floor 7. In this manner, I obtain in a single gate, a combined screen or grader and coal and slate separator, whereby commingling of the coal and slate in its movement through the machine is prevented and the slate more effectively and thoroughly separated from the coal.

In Figs. 5 and 6 of the drawings, I have disclosed a slightly modified construction wherein each of the ribs 26 and partitions 27 consists of spaced walls 28 and 29 respectively, said walls being integrally connected at their upper edges. The outer or exterior faces of these walls are inclined so that the coal and slate is directed thereby through the openings 24′ or into the pockets 25′ as the case may be. By providing the hollow partition walls 27, a comparatively broad flat upper surface 30 is produced upon each of said walls over which the coal may freely move. In this modified construction it will be observed that the partition walls

27 extend to the outer edges of the gate heads, and the floor 14′ also extends to the outer edges of said heads and is of greater width and curvature than the floor 14 disclosed in the preferred embodiment of the invention. The plate 17′ must therefore necessarily be located beyond the peripheries of the gate heads, only the teeth on said plate extending into the space between said heads. This modified gate structure is designed for use more particularly when the particles of coal and slate are extraordinarily large though it will of course be appreciated that both forms of the gate may be embodied in a single machine.

From the foregoing description taken in connection with the accompanying drawings, it is thought that the construction, manner of operation and several advantages of my invention will be clearly and fully understood. While I have referred to the invention as particularly designed as an improvement upon the gate disclosed in my prior application, it will be obvious that the same is not limited in its utility thereto but is applicable to various constructions of slate picking machines now in common use. It will be appreciated that as the gate consists of a single integral structure, the same will be highly durable in actual use, there being no movable parts employed to become broken or get out of order. The invention is also highly efficient and reliable in practical operation.

While I have above described the preferred construction and arrangement of the various parts of my invention it will be appreciated that the same is susceptible of considerable modification therein without departing from the essential features or sacrificing any of the advantages of the same.

Having thus described the invention, what is claimed is:

1. A gate for slate picking machines embodying a feed stop plate and a slate supporting floor arranged in spaced relation, spaced connecting walls between said plate and floor and a horizontal web integrally connecting the opposed walls, and means for actuating the gate.

2. A gate for slate picking machines embodying a feed stop plate and a floor arranged in diametrically opposed spaced relation and disposed above and below the axial center of the gate respectively and a plurality of spaced partition walls integrally connecting said plate and floor, and means for actuating the gate.

3. A gate for slate picking machines embodying a feed stop plate and a floor arranged in diametrically opposed spaced relation and disposed above and below the axial center of the gate respectively, a plurality of spaced partition walls integrally connecting said plate and floor, and webs integrally connecting the opposed walls, between the plate and floor, and means for actuating the gate.

4. A gate for slate picking machines embodying a feed stop plate and a floor arranged in spaced relation upon opposite sides of the rotative axis of the gate, and spaced partition walls integrally formed with the floor to form a series of slate receiving pockets, and means for actuating the gate.

5. A gate for slate picking machines embodying a feed stop plate and a floor arranged in spaced relation, a plurality of partition walls integrally formed with the floor forming a series of pockets, and a rib integrally connecting each of the partition walls with said plate, and means for actuating the gate.

6. A gate for slate picking machines embodying a feed stop plate and a floor arranged in spaced relation, a plurality of partition walls integrally formed with the floor forming a series of pockets, a rib integrally connecting each of the partition walls with said plate, and horizontal webs integrally connecting the upper ends of the partition walls to said plate.

7. A semi-open gate for slate picking machines embodying a feed stop plate, and a floor arranged upon diametrically opposite sides of the rotative axis of the gate and disposed above and below the same respectively, a plurality of ribs integrally formed at one of their ends with said plate and having their other ends disposed above the inner edge of the floor, said ribs forming a series of openings in the gate between the floor and said plate, and means for actuating the gate.

8. A semi-open gate for slate picking machines embodying a feed stop plate, and a floor arranged upon diametrically opposite sides of the rotative axis of the gate and disposed above and below the same respectively, a plurality of ribs integrally formed at one of their ends with said plate and having their other ends disposed above the inner edge of the floor, said floor being provided with a series of slate picking pockets between the same and said ribs, said ribs forming a series of openings in the gate between the floor and said plate.

9. A gate for slate picking machines embodying a feed stop plate and a floor arranged at opposite sides of the gate and above and below the rotative axis thereof respectively, a plurality of ribs integrally formed with the inner face of said plate and extending over the floor, and webs integrally connecting the lower edges of the opposed ribs with each other and with said plate, said webs and the inner edge of the floor defining a series of openings in the gate, and means for actuating the gate.

10. An oscillating gate for slate picking

machines embodying a feed stop plate and a floor arranged upon opposite sides of the rotative axis of the gate, and a plurality of integrally connected webs formed on said stop plate and extending over the inner edge of the floor, said webs and the inner edge of the floor defining a series of openings in the gate.

11. An oscillating gate for slate picking machines comprising spaced heads, a feed stop plate integrally connecting the heads at their outer edges, a floor also integrally connecting said heads and arranged in spaced diametrically opposed relation to said plate, a plurality of vertical partition walls integrally formed with the upper surface of the floor and providing a series of slate receiving pockets thereon, and a plurality of spaced ribs integrally formed with said partition walls and connecting the same with said plate, the space between the opposed inner edges of the floor and plate defining a series of openings in the gate.

12. An oscillating gate for slate picking machines embodying spaced heads, a feed stop plate integrally connecting said heads at their outer edges, a floor also integrally connecting said heads and arranged in diametrically opposed relation to said plate, a plurality of spaced partition walls formed upon the upper surface of said floor to produce a series of pockets thereon, a plurality of ribs arranged in the same diametrical plane as said partition walls and integrally connecting the same with said stop plate, and a web extending inwardly from the stop plate at the juncture of the ribs and partition walls and projecting over the inner edge of the floor, said webs and the inner edge of the floor defining a series of openings in the gate.

13. An oscillating gate for slate picking machines comprising spaced heads, a slate supporting floor integrally connecting said heads, in combination with a plate arranged between said heads and extending in concentric relation thereto, said plate being disposed inwardly of the outer edges of the heads, said floor moving over the plate and adapted to deliver the slate over the edge of said plate in the movement of the gate in one direction.

14. An oscillating gate for slate picking machines embodying a feed stop plate and a floor arranged upon opposite sides of the rotative axis of the gate, a plurality of spaced walls integrally connecting said plate and floor and forming a series of slate receiving pockets upon the floor, said floor having a toothed outer edge, and a toothed plate extending in concentric relation to the gate with which the teeth on the floor engage, the slate in said pockets being delivered from said toothed plate in the movement of the gate in one direction.

15. An oscillatory gate for slate picking machines embodying spaced heads, a stop feed plate and a floor arranged upon opposite sides of the rotative axis of the gate and integrally connecting the heads, spaced walls integrally connecting the plate and floor and forming a series of slate receiving pockets upon the floor, the space between said plate and the inner edge of the floor defining a series of openings in the gate, the outer edges of said floor and partition walls having teeth formed thereon, in combination with a plate arranged between the heads and extending in concentric relation thereto, said plate being provided with teeth with which the teeth on the floor engage in the oscillating movement of the gate, the slate in the pockets on said floor being delivered from the forward edge of the curved plate in the movement of the gate in one direction.

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

CHARLES S. FARRER.

Witnesses:
MARSHALL JONES,
JOHN R. JONES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."