Nov. 16, 1926. 1,607,105

G. C. SINGER

PORTABLE COAL TIPPLE

Original Filed July 22, 1924 3 Sheets-Sheet 1

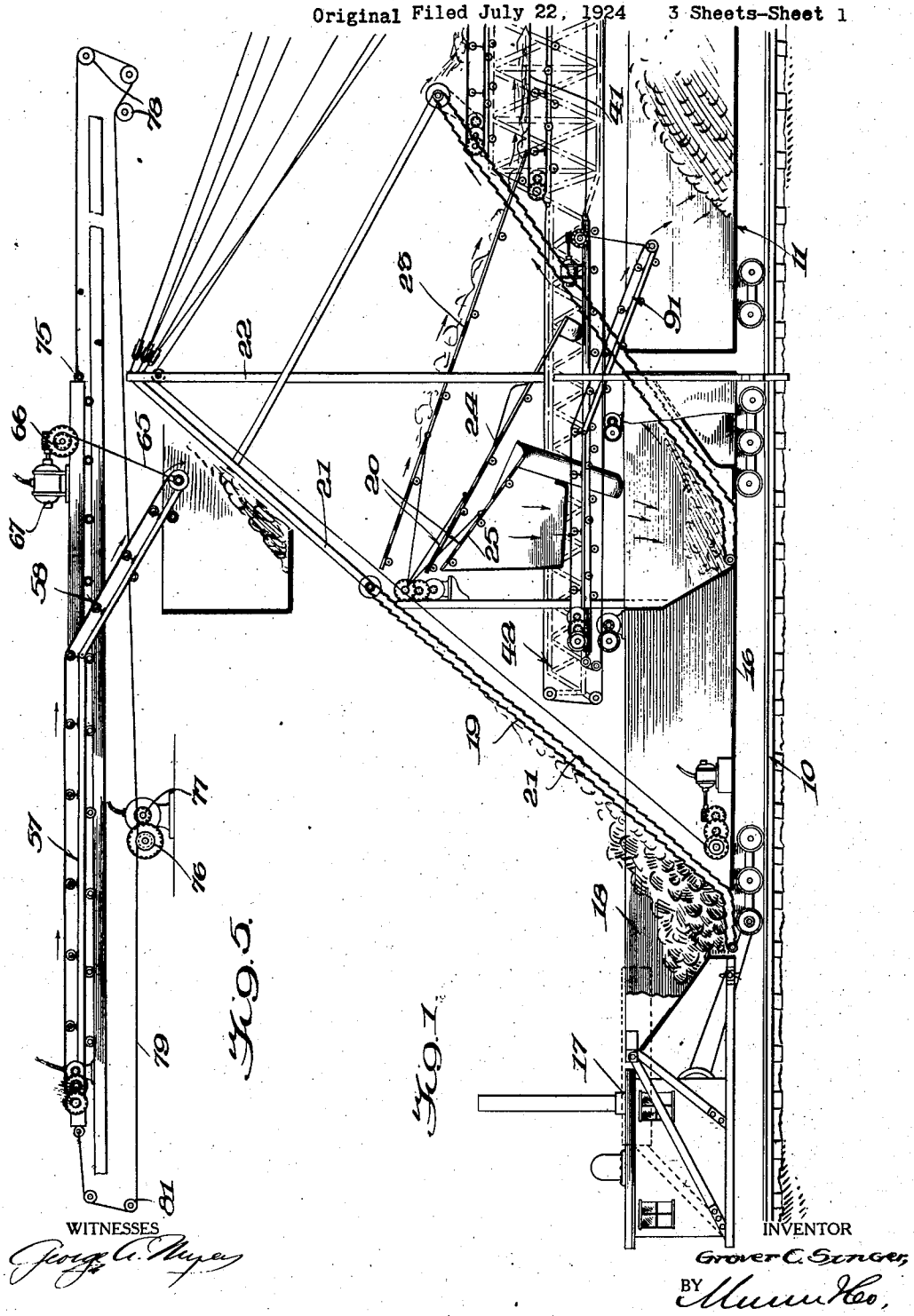


Fig. 1.

WITNESSES

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Original Filed July 22, 1924 3 Sheets-Sheet 2

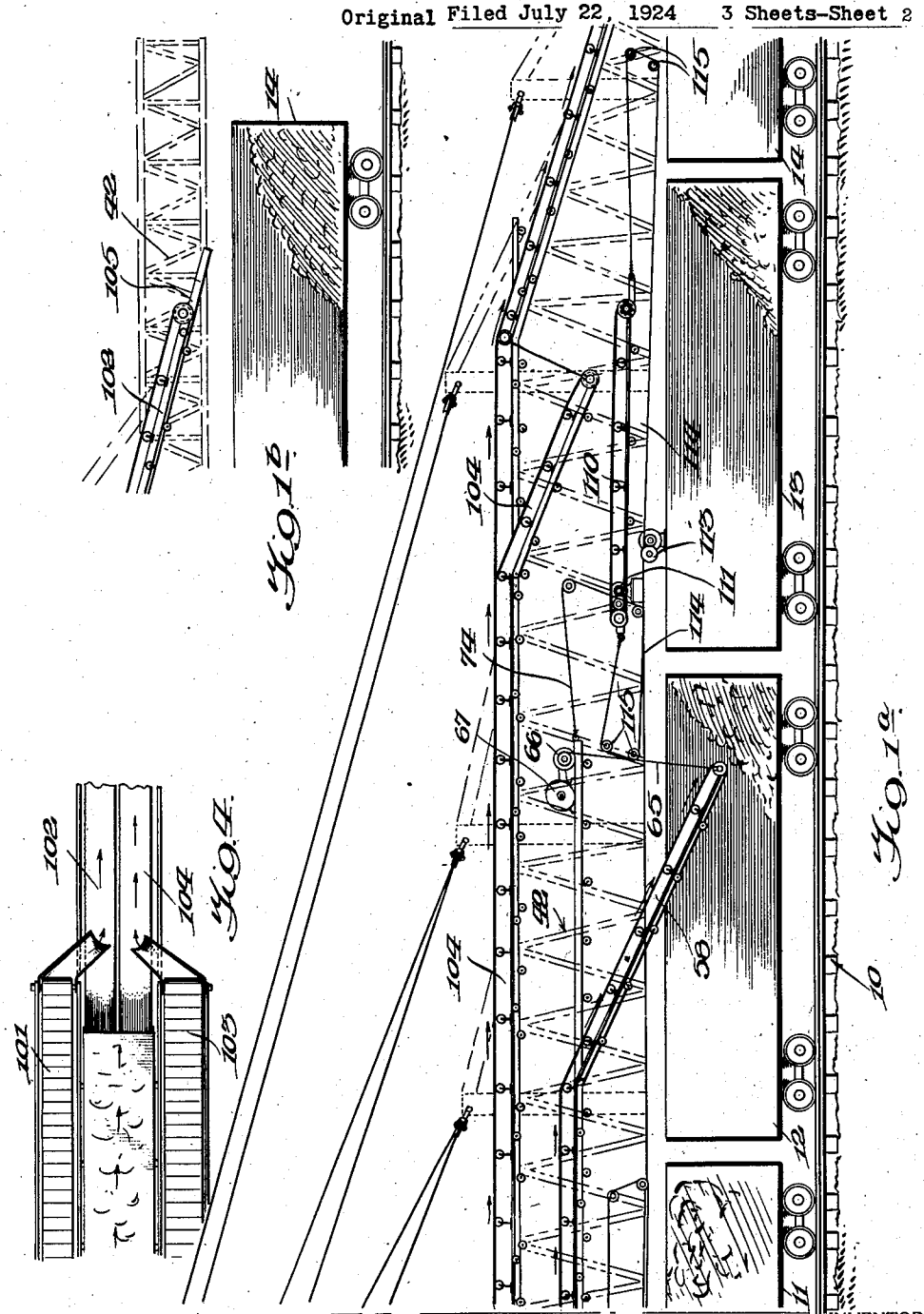


Fig. 1a.

Fig. 1b.

Fig. 1c.

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PORTABLE COAL TIPPLE

Original Filed July 22, 1924 3 Sheets-Sheet 3

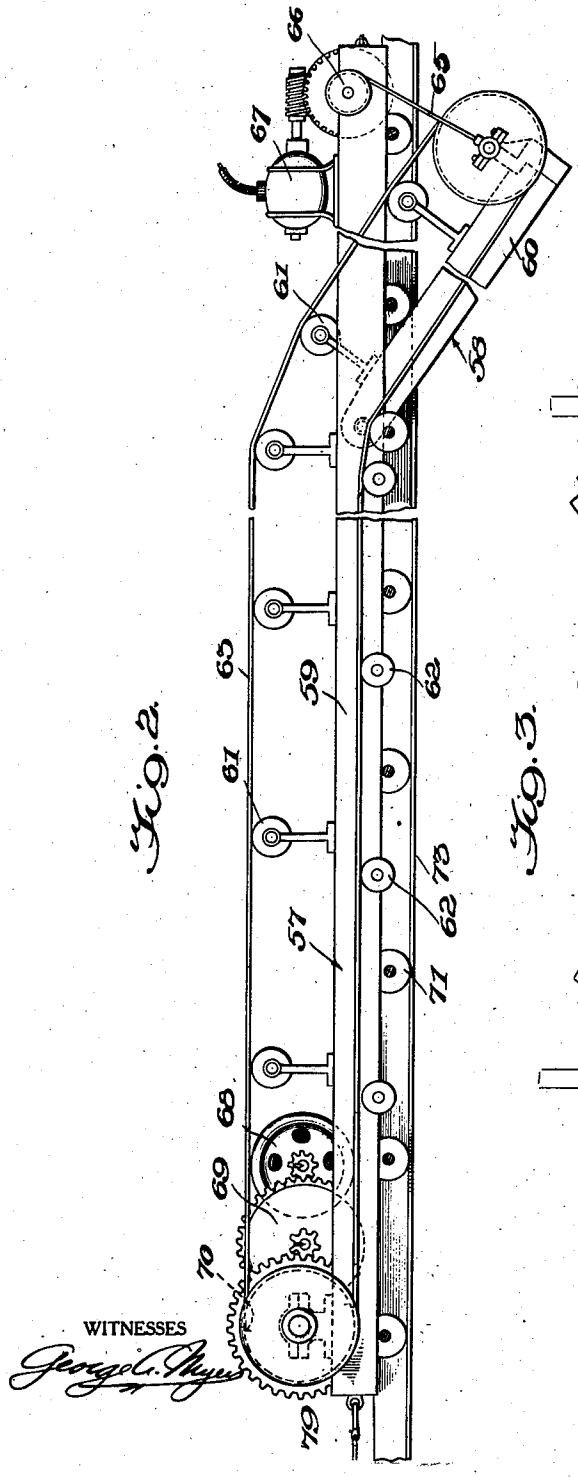


Fig. 2.

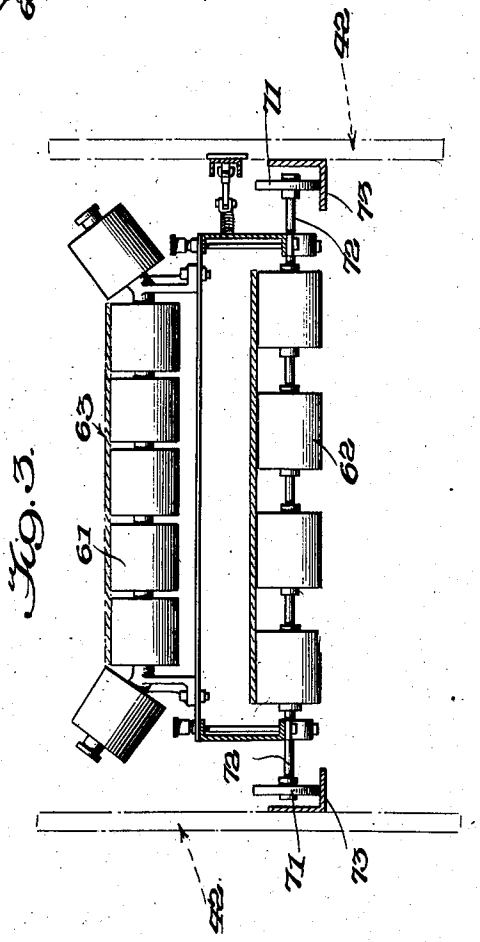


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

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PORTABLE COAL TIPPLE.

Original application filed July 22, 1924, Serial No. 727,526. Divided and this application filed October 12, 1925. Serial No. 62,158.

This invention relates in general to portable coal tipples especially designed for use with surface mining equipment, and more particularly to a conveyor organized with such a tipple, the present application being a division of my co-pending application filed July 22, 1924, Serial No. 727,526.

In the art of surface mining in which the present invention is used the dirt and rock constituting the overburden are stripped away or removed from the top of the coal by means of a large steam shovel and the coal is then dug up with a small steam shovel and thrown into small railway cars and hauled to a coal tipple, wherein it is graded or classified for shipment.

The present invention aims to obviate the necessity of providing the large and expensive stationary plant now used for grading or classifying the coal and also to obviate the necessity of the intermediate haul of the coal from the point at which the surface mining is being carried on to the point at which the tipple is located, the coal being graded or classified at the place where it is mined and being directly loaded into the cars utilized for shipping the same.

A further object is to provide a portable coal tipple which may be readily moved from place to place with the surface mining equipment as the mining operation progresses.

A still further object is to provide a portable coal tipple of this character and in which the classifying or grading and the loading operations are carried out continuously and in a novel and efficient manner.

Other objects and advantages of the invention reside in certain novel features of the construction, combination and arrangement of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming part of this specification, and in which:

Figure 1 is a fragmentary diagrammatic view partly in side elevation and partly in vertical section, showing a portion of an apparatus embodying the present invention.

Figure 1ª is a view similar to Figure 1 of an adjacent portion of the same apparatus.

Figure 1ᵇ is a view similar to Figures 1 and 2, showing the remaining portion of the apparatus illustrated in Figures 1 and 1ª.

Figure 2 is a detail view in side elevation of one of the loading conveyors.

Figure 3 is a view thereof in transverse section on line 3—3 of Figure 2.

Figure 4 is a fragmentary view in plan, illustrating the separate elevators and conveyors employed for the nut and slack.

Figure 5 is a fragmentary view in side elevation illustrating the manner of driving the shiftable loading conveyor.

Referring to the drawings, it will be understood that the present invention is designed for use with the usual surface mining equipment which is well known to those skilled in the art and needs no detailed explanation. In accordance with the usual practice after the overburden has been removed a single railway track 10 is laid on the coal to be dug up. Only the single track 10 is employed for the reason that it must be shifted about to permit the mining of all the coal. The present invention proposes in general the use of a portable coal tipple, designated generally at T which may be self-propelled or which may be moved about in any suitable manner on the track 10, and in conjunction with the tipple T a number of railway cars, designated at 11, 12, 13 and 14 are employed, the cars 11, 12, 13 and 14 being the ordinary cars used for tipping or transporting the coal to the point of use or storage. The portable coal tipple T may not only be moved about on the track 10 during the mining operation in any particular locality but may also be moved from one locality to another, thereby avoiding the very serious loss resulting from the abandonment or wrecking of the large stationary plants now in use as well as eliminating the expense of the intermediate haul from the point at which the coal is mined to the stationary tipple.

The portable coal tipple T comprises a wheeled platform 16 which may take the form of an ordinary railway car and which runs on the track 10. On one end of the platform 16 a power plant 17 is arranged and may utilize a steam boiler and an engine to drive the generator employed for generating the electricity utilized to drive

the various instrumentalities of the tipple or an internal combustion engine may be employed for this purpose. It is also to be understood that the wheeled platform 16 may be self-propelled by means of suitable electric motors or other means or may be hauled or drawn about as desired.

Adjacent the power plant 17 the wheeled platform 16 is provided with a hopper 18 into which the coal is dumped as mined from the steam shovel S. An elevator 19 is employed to carry the coal from the hopper 18 to the upper of a series of classifying screens, designated generally at 20, and hereinafter more fully described.

The elevator 19 is rotatably supported in a conventional manner on a frame 21, the frame 21 being secured at its lower end to the wheeled platform 16 and being connected at its upper end to a pair of masts 22. It is to be understood of course that the elevator 19 is of conventional construction and is electrically driven in accordance with the usual practice.

The shaker screens 20 constitute the means for classifying or grading the coal, and in the embodiment illustrated three shaker screens are employed and are arranged one above the other, there being a top screen, designated generally at 23 for separating the block coal from the egg, nut and slack, a middle screen 24 for separating the egg from the nut and slack, and a bottom screen 25 for separating the nut from the slack.

The screen 23 separates the block coal from all other sizes and delivers the block coal onto a loading conveyor designated generally at 41 and mounted for longitudinal movement or adjustment on a boom designated generally at 42.

The conveyor 41 is shown to advantage in Figures 2 and 3 and comprises a main frame 57 and a pivoted section 58. The main frame 57 includes fixed side bars 59 and the pivoted section 58 includes pivoted side bars 60, and these side bars 59 and 60 carry rollers 61 and 62 around which the endless conveyor element 63 runs. As shown to advantage in Figure 2 the pivoted bars 60 are arranged adjacent one end of the fixed bars 59 and are pivotally connected to the inner sides of these fixed bars. The inclination of the bars 60 with respect to the bars 59 is controlled by means of a cable 65 having one end connected to the pivoted sections 58 and having its other end wound about the winding drum 66 controlled by an electric motor 67 mounted on the main frame 57. The endless conveyor element 63 may be driven in either direction by means of an electric motor 68 and gearing 69 between the electric motor 68 and the end roller 70 over which the conveyor element 63 is trained.

The conveyor 41 is mounted on the boom 42 for longitudinal movement in either direction by means of wheels 71 rotatably mounted on axles 72 carried by the main frame 67 of the conveyor, the wheels 71 running on tracks 73 provided on the boom 42.

Means is employed for positively moving the conveyor 41 in either direction along the tracks 73 and as shown to advantage in Figure 1 it may comprise a cable 74 having one end connected as at 75 to one end of the conveyor 41, the other end of the cable 74 being wound on a winding drum 76 driven by an electric motor 77. Intermediate its ends the cable 74 is trained over guide sheaves 78. A second cable 79 is also provided and has one end connected as at 80 to the end of the conveyor 41 opposite to the connection 75 of the cable 74, the other end of the cable 79 being reversely wound on the drum 76 and the intermediate portion of the cable 79 being trained over guide sheaves 81. With this arrangement when the winding drum 76 is rotated in one direction as for instance in a counter-clockwise direction, as viewed in Figure 3 the cable 74 will be wound on the drum 76 and the cable 79 will be paid out whereby the conveyor 41 is moved to the right as viewed in Figure 3. Rotation of the winding drum 76 in a clockwise direction causes the cable 79 to be wound on the drum 76 and the cable 74 to be paid out and consequently result in the movement of the conveyor 41 to the left, as viewed in Figure 1. By virtue of this movement and control of the conveyor 41 the block coal which slides onto the conveyor may be loaded into the car 12 along the entire length of the car, and as the swinging section 58 may be moved upwardly or downwardly within limits the level at which the block coal is delivered to the car 12 may be varied.

The egg, nut and slack fall through the perforations 28 of the screening element 27 of the shaker screen 23 onto the screening element 85 of the shaker screen 24, the said shaker screen 24 being disposed immediately below the shaker screen 23. The screen 24 separates the egg coal from the nut and slack and delivers the egg coal onto a loading conveyor designated generally at 91. The conveyor 91 is identical in construction with the conveyor 41 and is mounted on the boom and driven and controlled in exactly the same manner as the conveyor 41, the conveyor 91 serving to load the car 11 with egg coal.

The nut and slack coal which fall through the openings 87 of the screening element 86 drop onto the shaker screen 25. The screen 25 separates the slack from the nut and delivers them to individual compartments in the wheeled platform from which they are carried by elevators presently to be de-

scribed. For a full and complete illustration of the screens 23, 24 and 25 and of the tipple in general, reference is made to my co-pending application filed July 22, 1924, Serial No. 727,526.

An elevator 101 carries the nut coal from the compartment 98 up onto a conveyor 102 carried by the boom along one side of the top thereof. Similarly an elevator 103 carries the slack from the compartment 100 up to a conveyor 104 provided along the top of the boom 42 on the opposite side of the boom from the conveyor 102, as shown to advantage in Figure 4.

The conveyor 102 delivers the nut coal into the car 14, and this car 14 being the end car may be shifted to load the car throughout its length. Of course, if found desirable, a travelling conveyor, similar to the conveyors 41 and 91, may be employed on the boom in conjunction with the conveyor 102 if found desirable. Moreover lateral chutes or conveyors may be employed at the delivery end of the conveyor 102 if the same should be found desirable. Such a chute is designated at 105 in Figure 1b.

The conveyor 104 delivers the slack onto a conveyor 110 having its frame provided with wheels or rollers which run on tracks on the boom in the same manner as the conveyors 41 and 91. The conveyor 110 does not however, include any swinging section but it is proposed to drive the endless element of the conveyor 110 in either direction by simply reversing the electric motor 111 which drives the conveyor 110 through gearing 112. The conveyor 110 is shifted longitudinally in either direction by means of a motor actuated drum 113 and a pair of cables 114 reversely wound on said drum and connected to the opposite ends of the frame of the conveyor 110, the intermediate portions of the cable 114 being trained over guide sheaves 115. By shifting the conveyor 110 longitudinally and driving the conveyor so as to cause it to deliver the slack coal first from one end and then from the other the car 13 may be loaded for its entire length.

With this arrangement the coal is taken as it is mined and at the place where it is mined and is graded or classified and the classified products are immediately loaded into individual cars ready for shipment to the point of use or storage. In this manner the intermediate haul of the coal as mined from the point at which it is mined to the stationary plant at which it is graded is eliminated. Moreover the coal is directly loaded after the grading in such a novel and efficient manner as to occasion a minimum of handling and so as to permit of continuous operation. These advantages are had and at the same time a portable tipple is provided which may be readily moved from place to place during the mining operation and from one locality to another.

What I claim is:—

In a portable coal tipple of the character described, a boom having tracks, a conveyor having a main frame including side bars, said side bars being provided with wheels running on the track whereby the conveyor is mounted for longitudinal adjustment on the boom, means for shifting the conveyor on the boom in either direction, said conveyor having a vertically swingable section including side bars having their inner ends pivotally connected to the side bars of the main frame, means for controlling the swinging movement of said pivoted section including a motor actuated winding drum mounted on the main frame of the conveyor and movable therewith, and a cable wound on the drum and connected to the outer end of the pivoted section.

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