

June 23, 1925.

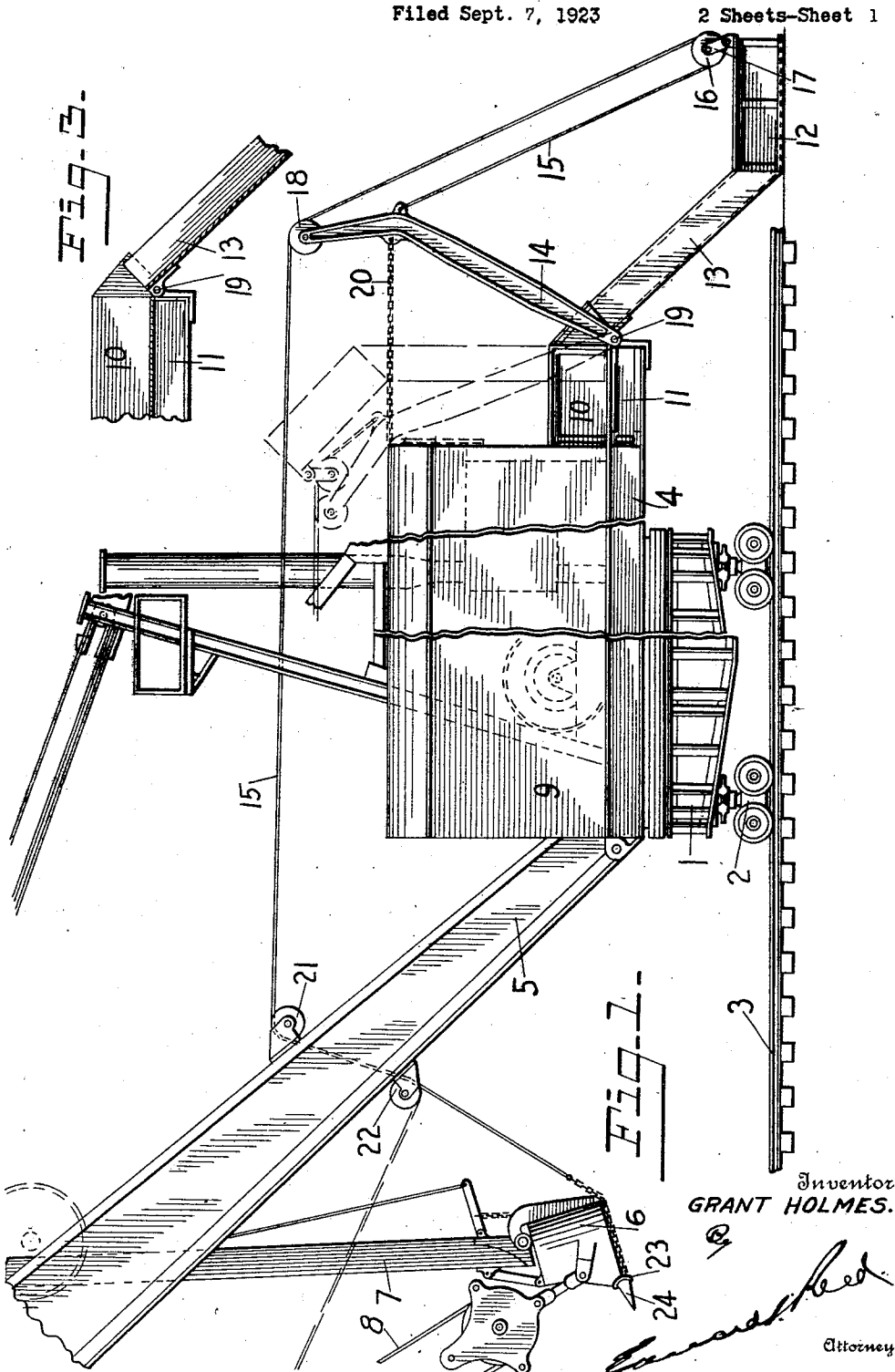
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G. HOLMES

COALING DEVICE

Filed Sept. 7, 1923

2 Sheets-Sheet 1



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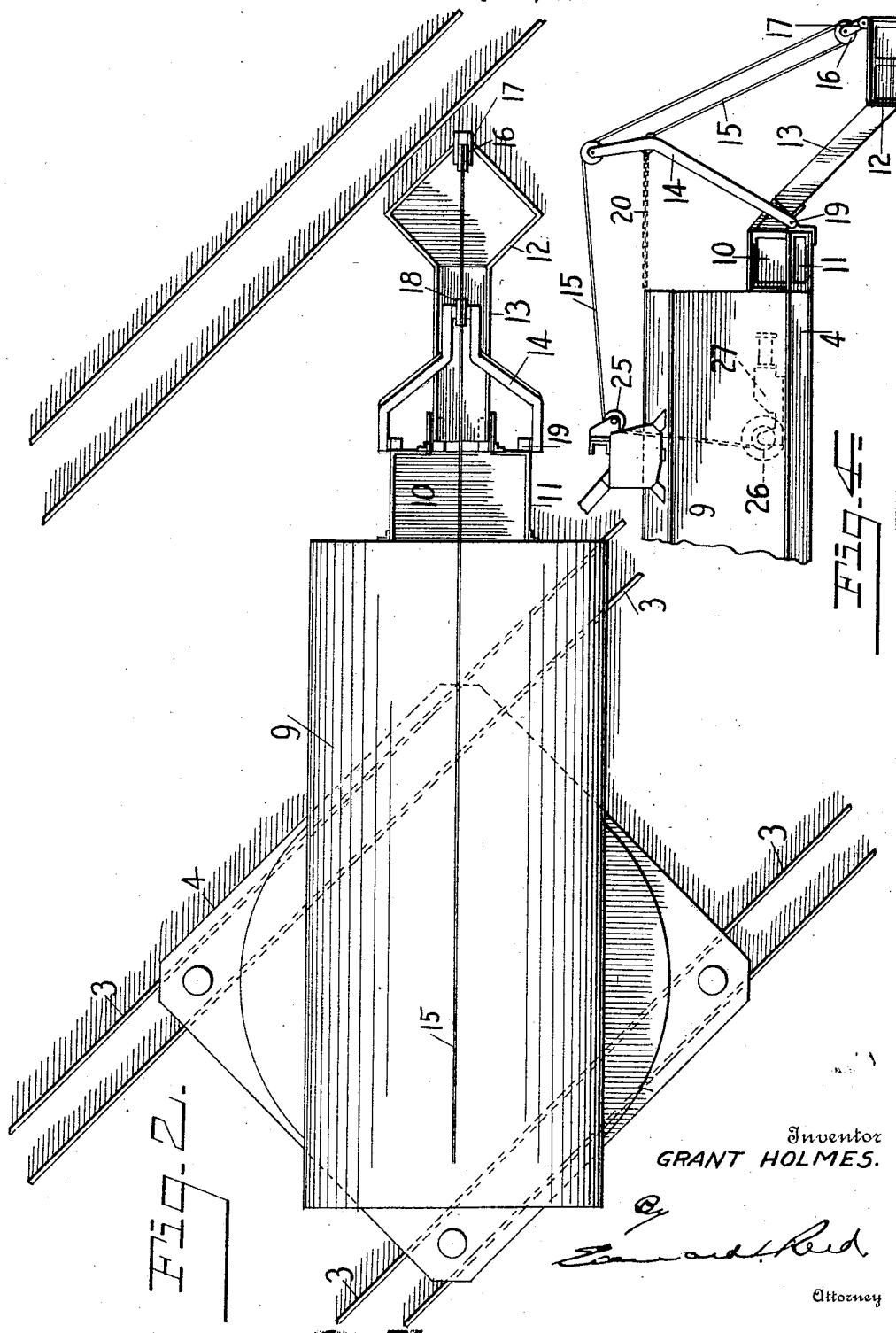
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Patented June 23, 1925.

1,543,435

UNITED STATES PATENT OFFICE.

GRANT HOLMES, OF DANVILLE, ILLINOIS, ASSIGNOR TO THE MARION STEAM SHOVEL COMPANY, OF MARION, OHIO, A CORPORATION OF OHIO.

COALING DEVICE.

Application filed September 7, 1923. Serial No. 661,345.

To all whom it may concern:

Be it known that I, GRANT HOLMES, a citizen of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Coaling Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a coaling device for steam shovels and the like and is designed more particularly for use with the large revolving shovels used for stripping the overburden from deposits of coal, ore and the like.

Shovels of this type are of large capacity and require large quantities of coal for their operation. The revolving frame or platform which carries the power plant is located a considerable distance above the ground and when the machine is coaled by hand the coal must be handled at least twice in loading it onto the platform and this involves an amount of time and labor which adds materially to the cost of the operation.

One object of the invention is to provide a power operated device by means of which the necessary quantity of coal may be quickly and easily delivered from the ground to the bin on the revolving frame.

A further object of the invention is to provide a coaling device of such a character that the coal may be dumped into the same from a car or the like and then delivered directly to the coal bin on the frame, thus avoiding all manual handling of the coal.

A further object of the invention is to provide such a device which may be operated by a moving part of the excavating mechanism.

A further object of the invention is to provide a coaling device which will be simple in construction and operation; and which, when not in use, will occupy a position in which it will not interfere with the normal operation of the machine.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawings Fig. 1 is a side elevation, partly broken away, of a revolving steam shovel showing my invention applied thereto; Fig. 2 is a plan view of the revolving frame and coaling device; Fig. 3 is a detail view of the hinged connection between the chute and the frame;

and Fig. 4 is an elevation of a portion of the revolving frame showing a modified form of operating mechanism for the coaling device.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a stripping shovel of the revolving type but it will be understood that the device may be applied to machines of various kinds and that the mechanism may take various forms without departing from the spirit of the invention.

In the particular embodiment of the invention here illustrated the steam shovel comprises a base 1 supported at its corners by trucks 2, which travel on parallel tracks 3, the two trucks at one side of the base traveling on one track and the trucks on the other side traveling on the other track. Mounted on the base 1 for rotation about a vertical axis is a frame or platform 4 on the forward end of which is supported a boom 5 which carries the excavating device. In the present type of machine the excavating device comprises a dipper 6 connected by a dipper arm 7 with the boom and actuated by the usual crowding engine which is carried by the boom. Upward and forward movement is imparted to the dipper by the usual hoisting cable 8. Mounted upon the revolving frame 4 and enclosed within a cab 9 are the power plant and operating mechanism. The steam shovel itself being of a well known construction it is not necessary to further describe it in detail.

As has been stated the revolving frame or platform is elevated a considerable distance above the ground or supporting surface over which the machine is operating and it is necessary to deliver to this frame or platform the coal required for the operation of the power plant, which is usually several tons a day. The machine is provided with a coal bin of suitable capacity which is usually supported on the revolving frame at the rear end of the cab 9. This coal bin, which is shown at 10, may be mounted directly on the main frame or it may, as here shown, be carried by an extension 11 of the main frame. For the purpose of delivering the coal from the ground to the coal bin on the revolving frame I have provided an elevating mechanism comprising a coal receptacle or box 12 connected by means of a chute 13 with the bin 10, the

chute being hinged at its inner end to the frame and constituting a connection between the coal box and the frame. The coal box may be of any suitable size and shape but it is preferably of several tons capacity and is, in the present instance, shown as rectangular in shape, the chute 13 being connected therewith at one corner thereof so that the two outer or rear side walls of the box extend obliquely to the length of the revolving frame. The length and arrangement of the chute 13 are such that the box may be lowered onto the ground and will rest thereon in an upright position, thereby enabling the coal to be dumped into, or otherwise delivered to, the box from a coal car or other suitable carrier. Means are provided for moving the coal box and the outer end of the chute upwardly about the pivoted connection of the chute with the frame, so that when the coal box has been moved to a position above the point of connection of the chute with the frame the coal will be discharged by gravity through the chute to the coal bin, with which the inner end of the chute is in open communication. Various means may be provided for accomplishing this but, in the present instance, I have mounted on the rear end of the revolving frame a sheave supporting member or leg 14. A cable 15 is connected at one end with said leg at a point spaced from the upper end thereof and extends downwardly and about a sheave 16 which is connected with the outer edge of the coal box 12, preferably by links 17, and thence upwardly about a sheave 18 at the upper end of the leg 14 and thence forwardly to the operating mechanism. Preferably the leg 14 is pivotally mounted on the revolving frame, as shown at 19, and its downward movement is limited by a suitable stop, such as a chain 20 connected at one end with the leg and at the other end with a fixed part of the mechanism, such as the cab 9. When power is applied to the cable 15 a downward pull will be exerted upon the leg 14 which will retain the same in its proper position and an upward pull will be exerted upon the coal box so that the latter will be elevated and its contents discharged through the chute into the coal bin. After the contents of the coal box have been discharged its upward movement is continued until its position with relation to the leg 14 is such that the cable 15 will exert a forward pull upon the leg as well as upon the coal box, thereby causing both members to move forwardly. As these members pass their centers of gravity the pull on the cable is discontinued and they are allowed to move forward by gravity against a stationary part of the mechanism, such as the rear end of the cab 9, which constitutes a support therefor. The upper end of the leg is arranged

at an angle to the body thereof and the coal box and chute may be moved into positions close to the leg and the several parts will be held against return or rearward movement by gravity.

Any suitable means may be provided for actuating the cable 15 to elevate the coal box but I prefer to utilize for this purpose a moving part of the excavating mechanism, thereby avoiding the necessity of installing a separate power unit. In the present arrangement the cable 15 is carried forward beyond the front end of the cab and is passed about a sheave 21 on the upper side of the boom 5 and then about a sheave 22 on the lower side of the boom and its forward end is connected with the excavating device, the connection being, in the present instance, made directly with the dipper. The connection between the cable and the excavating device is preferably detachable so that the cable may be disconnected therefrom and will not in any way interfere with the ordinary operation of the mechanism. To this end the cable is here shown as provided with a ring 23 adapted to engage over a tooth 24 of the dipper. Consequently when the dipper is moved forwardly a forward pull will be exerted on the cable and the coal box will be elevated as above described. When the coaling operation has been completed the cable is disconnected from the dipper and coiled in an out of the way position until its use is again required for a further coaling operation. The arrangement is such that the coaling device may be very quickly and very easily connected with or disconnected from the excavating mechanism so that the whole coaling operation will be accomplished in a very short space of time. The coal box and the chute being supported in their idle positions just forward of their centers of gravity very little power is required to move them rearwardly so that they will move to their operative positions by gravity. This can easily be done by a workman. Before the coal box is pushed across its center of gravity the cable will be attached to the excavating device and tightened up sufficiently to check the falling movement of the coal box and cause the same to be lowered slowly to the ground.

While I prefer to operate the coaling device from the excavating mechanism of the machine it is entirely practical to operate it from some other source of power and in Fig. 4 of the drawings I have shown the cable 15 as extending about a sheave 25 mounted above the cab 9 and downward into the cab where it is connected with a drum 26 driven by a steam engine 27.

It will be apparent from the foregoing description that I have provided a coaling device which is very simple in its construction and operation and which can be oper-

ated from a moving part of the machine, and which will deliver to the bin a large supply of coal at one operation. Inasmuch as the coaling device is so arranged that the coal can be dumped into the box from the car it is unnecessary to move the coal by hand at any time during the coaling of the machine. Further, the mechanism is of such a character that when not in use it will be supported in a position where it will in no way interfere with the normal operation of the machine. Further, the device may be applied to an ordinary steam shovel of the type here shown without changing the construction thereof.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may appear to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a steam shovel or the like, the combination with a frame adapted to support a power plant, and a coal bin carried by said frame, or a coal box, a chute connecting said coal box with said bin and having a hinged connection with said frame, and power operated means to elevate said coal box and cause its contents to be discharged through said chute into said bin, said chute and said coal box being so arranged that they will be retained in their elevated positions by gravity.

2. In a steam shovel or the like, the combination with a frame adapted to support a power plant, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having a hinged connection with said frame, a leg pivotally mounted on said frame, means to limit the outward movement of said leg, a sheave carried by said leg, a cable connected with said coal box and extending about said sheave, and means to actuate said cable to elevate said coal box to a position in which its contents will be discharged through said chute into said bin, and to move said coal box and said leg into positions above said frame.

3. In a steam shovel or the like, the combination with a frame adapted to support a power plant, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having a hinged connection with said frame, a leg pivotally mounted on said frame, means to limit the outward movement of said leg, a sheave carried by said leg, a cable connected with said coal box and extending about said sheave, and means to actuate said cable to elevate said coal box to a position in which its contents will be discharged through said

chute into said bin, and to move said coal box and said leg into positions beyond their centers of gravity so that they will be held against return movement by gravity.

4. In a steam shovel or the like, the combination with a frame adapted to support a power plant, excavating mechanism supported by said frame, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having hinged connection with said frame, and means for operatively connecting said coal box with said excavating mechanism, whereby the movement of said excavating mechanism will elevate said coal box and cause its contents to be discharged through said chute into said bin.

5. In a steam shovel or the like, the combination with a frame adapted to support a power plant, a boom carried by said frame, an excavating device pivotally mounted on said boom, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having hinged connection with said frame, and a cable connected with said coal box and with said excavating device and so arranged that the movement of said excavating device will elevate said coal box and cause its contents to be discharged through said chute into said bin.

6. In a steam shovel or the like, the combination with a frame adapted to support a power plant, a boom carried by said frame, a dipper movably mounted on said boom, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having hinged connection with said frame, and a device for operatively connecting said coal box with said dipper, whereby the movement of said dipper will elevate said coal box.

7. In a steam shovel or the like, the combination with a frame adapted to support a power plant, a boom carried by said frame, a dipper movably mounted on said boom, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having hinged connection with said frame, a sheave supporting member mounted at the rear end of said frame, a sheave carried by said member, and a cable connected with said coal box, extending about said sheave and connected with said dipper.

8. In a steam shovel or the like, the combination with a frame adapted to support a power plant, a boom carried by said frame, a dipper movably mounted on said boom, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having hinged connection with said frame, a sheave supporting member pivotally mounted at the rear end of said frame and extending upwardly there-

from, means to limit the downward movement of said member, a sheave carried by said member, a sheave carried by said coal box, a cable secured to said sheave supporting member extending about the sheave on said coal box and thence about the sheave on said supporting member and connected at its forward end with said dipper.

9. In a steam shovel or the like, the combination with a frame adapted to support a power plant, a boom carried by said frame, a dipper movably mounted on said boom, and a coal bin carried by said frame, of a coal box, a chute connecting said coal box with said bin and having hinged connection

with said frame, a sheave supporting member pivotally mounted at the rear end of said frame extending upwardly therefrom, means to limit the downward movement of said member, a sheave carried by said member, a sheave carried by said coal box, a cable secured to said sheave supporting member, extending about the sheave on said coal box and thence about the sheave on said supporting member and a detachable connection between said cable and said dipper.

In testimony whereof, I affix my signature hereto.

GRANT HOLMES.