March 6, 1928. 1,661,629.

C. F. OSGOOD

MINING APPARATUS

Filed Dec. 4, 1925

Fig. 1.

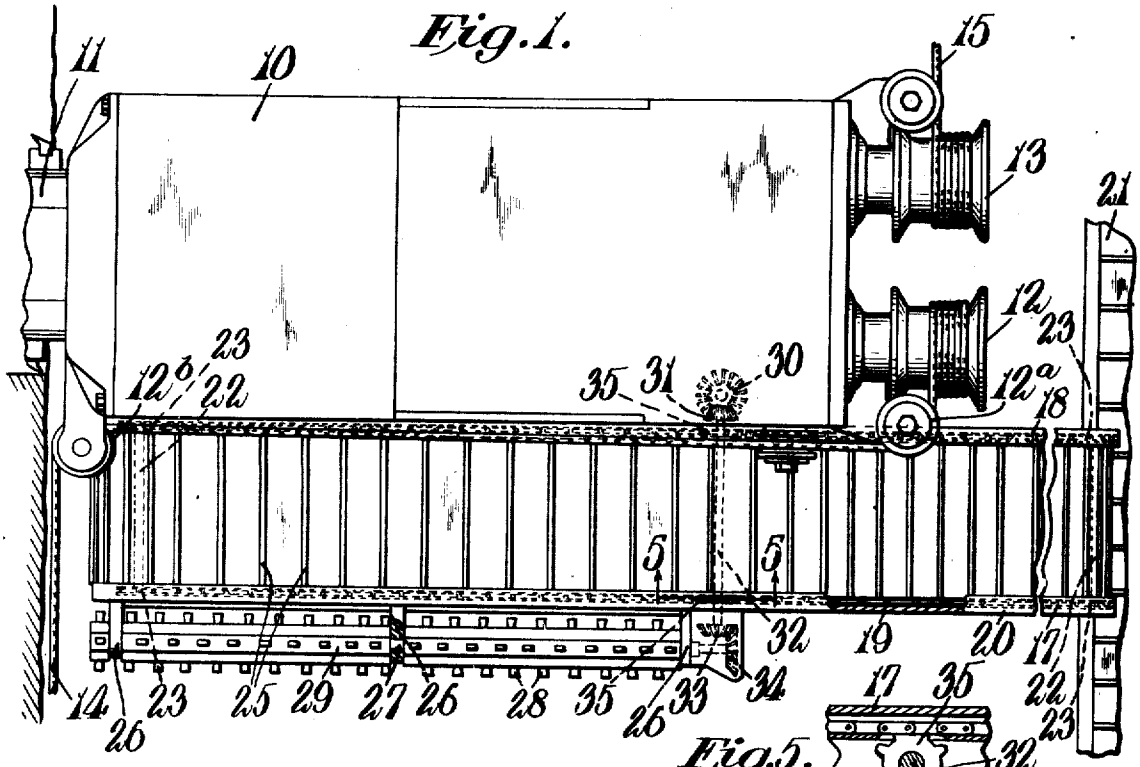


Fig. 5.

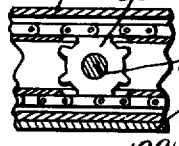


Fig. 2.

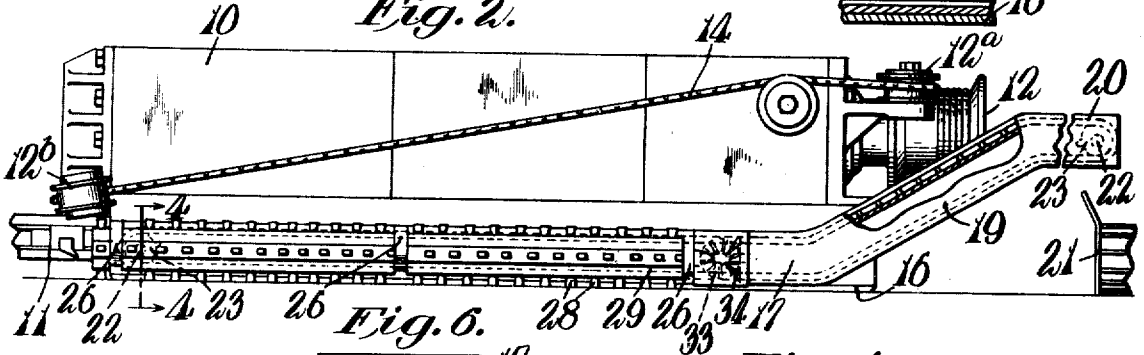


Fig. 6.

Fig. 3.

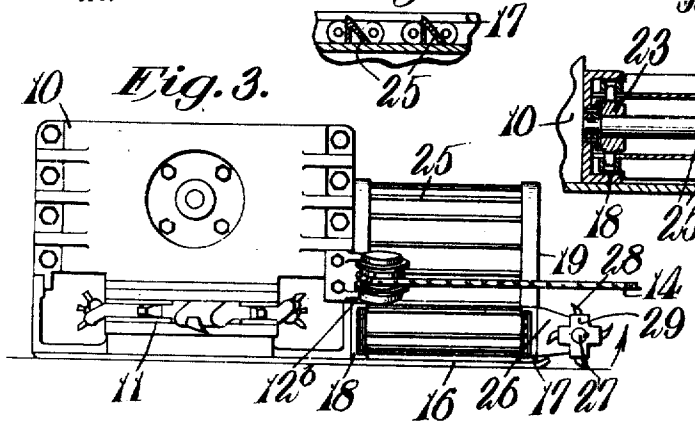


Fig. 4.



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Patented Mar. 6, 1928.

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UNITED STATES PATENT OFFICE.

CHARLES F. OSGOOD, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, A CORPORATION OF MASSACHUSETTS.

MINING APPARATUS.

Application filed December 4, 1925. Serial No. 73,178.

This invention relates to mining apparatus and more particularly to mechanism for mining coal.

The main object of the invention is to provide apparatus that will simultaneously cut and load or otherwise handle coal that has been separated from the mine face. Another object of the invention is to embody in the apparatus a coal cutting machine of standard type. Another object of the invention is to so organize the cutting and loading mechanisms that the feeding mechanism belonging to the mining machine will serve in connection with the loading mechanism also. Other objects of the invention will appear as the description proceeds.

The invention accordingly resides in the organization and details of construction, or the equivalents thereof, hereinafter more specifically described and then defined in the claims.

In the accompanying drawings I have shown for purposes of illustration one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a plan view of a machine embodying the invention with certain parts not essential to understanding of the invention shown in fragments.

Fig. 2 is a similar side view.

Fig. 3 is a front end view.

Fig. 4 is a transverse vertical section on the line 4—4 of Fig. 2.

Fig. 5 is a detail longitudinal section on the line 5—5 of Fig. 1.

Fig. 6 is a sectional detail illustrating the conveyor structure.

In the present instance the invention is illustrated as including a mining machine of the room and pillar type comprising an elongated body 10 containing the usual motor and driving and controlling mechanisms for the cutter bar and feed. At the forward end of the body, cutting means, in this instance a cutter bar 11, projects horizontally on the longitudinal axis of the body and at the rear end of the body there is provided a pair of drums 12, 13 for control of the usual flexible feeding elements, in this instance two cables, shown at 14, 15. The mining machine illustrated is of the type which in operation is moved transversely of its length along the coal face, the cable 14 passing over guides 12ª, 12ᵇ and extending along the coal face acting as the feeding element or haulage means and the cable 15 as the control element through which and the speed controls for the drum 13 the angle of the machine to the coal face may be varied in well known manner.

The novel organization constituting the invention comprises the combination with the mining machine above described, or with any type of bottom cutting machine, of gathering and conveying means so located with reference to the cutting means of the machine as to be both spaced and offset from the cutter bar in a horizontal plane, thereby obtaining a stepped relation between the cutting means and gathering means permitting the cutter bar to be inserted in the face to cut a kerf in the usual manner while the gathering mechanism moves along the face and handles coal that has been shot down after a previous cutting operation. To bring the cutting and gathering mechanisms into proper relation, the gathering mechanism is preferably connected to one longitudinal side of the machine body, as clearly shown in Fig. 1, and the gathering mechanism may be mounted on a bottom pan 16 which preferably forms an extension of the bottom pan of the mining machine proper. On this pan there are mounted the inwardly facing channel members 17, 18, with the member 18 against the side of the machine body 10. These members carry the conveying means and extend horizontally for substantially the length of the machine body and then are deflected upwardly as at 19, ending in a horizontally extending portion 20 designed to overhang a separate conveying apparatus or face conveyor shown fragmentarily at 21. Bridging the channel members 17, 18 at suitably spaced points to properly support the conveyor are transverse rotatable shafts 22 one of which is shown in Fig. 4. These shafts carry sprockets 23 over which the sprocket chains carrying the conveyor 24 run. These sprockets and chains are housed within the flanges of the channel members 17, 18 which therefore form the guides for the conveyor while in a measure protecting the sprockets and chains from the material being handled. In its preferred form the conveyor 24 comprises an endless apron on which there are carried equally spaced

transverse bars or vanes 25 which are preferably of the angular cross section shown in Fig. 6. This arrangement of conveyor parts provides a succession of pockets which receive and retain the material as it is raised up to the elevated extension 20 of the conveyor. On the outer face of the channel member 17 there are mounted a suitable number, in this instance three, of outwardly extending bearing brackets 26 in which there is journaled a horizontally extending shaft 27 carrying a gathering element which in this instance is shown as comprising a succession of teeth 28 carried on the members 29 which are fixed to the shaft 27, but any preferred form of gathering roller may be used. This gathering means extends throughout the greater part of the length of the machine body 10. Both the conveyor and the gathering element are preferably rotated by power from the motor carried by the mining machine and as illustrating one form which the drive may take there is shown in Fig. 1 a drive pinion 30 which is driven in any preferred manner from the machine motor and which in turn drives a pinion 31 on the inner end of a shaft 32 which extends outwardly from the side of the body 10 between the upper and lower runs of the endless apron 24 and out beyond the channel member 17 in which it is journaled. The end projecting beyond the channel member 17 has fixed to it a pinion 33 which meshes with a pinion 34 on the forward end of shaft 27 carrying the gathering element. The shaft 32 also has secured thereto within the channel members 17, 18 sprocket pinions 35 (Fig. 5) which engage the upper and lower runs of the conveyor chains and serve to drive the conveyor. With the driving mechanism described and illustrated in Fig. 1 it will be seen that the gathering means will be rotated in the direction of the arrow in Fig. 3, thereby undermining loose material against which it is brought and moving it in a direction transverse of the machine body and on to the conveyor 24, while the conveyor will be rotated in the direction of the arrow in Fig. 5 its effective portion traveling in a longitudinal direction with respect to the body 10 and away from the cutter bar in a manner to deliver material to elevated end 20 of the conveyor and from that to the face conveyor 21.

With the organization above described there is provided a cutting means, in this instance the cutter bar 11, and gathering and conveying means, in this instance the shaft 27 carrying the teeth 28, each so located with reference to the other that the gathering mechanism is spaced and offset horizontally from the cutter bar, thus bringing the gathering mechanism to a position adjacent the coal face at a time when the cutter bar is working in a kerf beneath the face. This arrangement of the gathering mechanism and cutter bar affords space between them for the conveying mechanism, in this instance the conveyor 24, which thus extends along one longitudinal side of the body of the machine.

In operation the apparatus above described will be moved across a coal face with the initial cut being made with the machine operating simply as an under cutter. After the initial cut has been made the coal is shot down, the feed cable being first laid within the kerf, and the machine again brought to the rib and sumped into the new face, sufficient loose coal to admit the body of the machine being first removed at the rib. When the bar has been sumped into the face, the gathering and conveying apparatus will be in position to gather the coal shot down after the first cut and as the machine is again moved across the face the previously shot coal will be gathered and conveyed wherever desired at the same time that the next kerf is being cut.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

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

1. The combination with a coal cutting machine of the type having an elongated body slidable on the mine bottom and a cutter bar extending from one end of the body, of gathering and loading mechanism connected to the body and comprising mechanism for moving loose material first transversely and then longitudinally of said body and out of the path of the latter.

2. The combination with a coal cutting machine of the type having an elongated body slidable on the mine bottom and a cutter bar extending from one end of the body, of gathering mechanism connected to one longitudinal side of the body and comprising mechanism for moving loose material first transversely and then longitudinally of said body and out of the path of the latter.

3. The combination with a coal cutting machine of the type having an elongated body slidable on the mine bottom and a cutter bar extending from one end of the body, of gathering and loading mechanism connected to the body and comprising mechanism for moving loose material first transversely and then longitudinally of said body and out of the path of the latter, that part of the gathering mechanism first to engage the loose material being in substantially the same plane as the cutter bar.

4. The combination with a coal cutting

machine of the type having an elongated body slidable on the mine bottom and a cutter bar extending from one end of the body adjacent the base thereof, of gathering mechanism connected to the body at one longitudinal side thereof and at the same level as the cutter bar and comprising mechanism for moving loose material towards the side of said body and thereafter moving it along the side and out of the path of the latter.

5. The combination with a coal cutting machine of the type having an elongated body slidable on the mine bottom, a motor contained in said body, and a cutter bar extending from one end of the body adjacent the base thereof, of gathering mechanism driven by said motor and connected to the body at one longitudinal side thereof and at the same level as the cutter bar and comprising a conveyor extending along the side of the body and a gathering roll mounted at the outer side of the conveyor.

6. The combination with a coal cutting machine of the type having an elongated body slidable on the mine bottom, a motor contained in said body, and a cutter bar extending from one end of the body adjacent the base thereof, of gathering mechanism driven by said motor and connected to the body at one longitudinal side thereof and at the same level as the cutter bar and comprising a conveyor extending along the side of the body and a gathering roll mounted at the outer side of the conveyor on an axis extending longitudinally of the conveyor and throughout the greater part of its length.

7. The combination with a coal-cutting machine of the type having an elongated body slidable on the mine bottom and a cutter bar extending from one end of the body adjacent the base thereof, of gathering mechanism connected to the body at one longitudinal side thereof and at the same level as the cutter bar and comprising an endless conveyor extending along the side of the body and a gathering roll mounted at the outer side of the conveyor on an axis extending longitudinally thereof and positioned in a horizontal plane extending below the upper run of the conveyor.

8. A mining machine comprising an elongated body having a motor and cutting means projecting horizontally from one end thereof and having gathering means driven by said motor and extending adjacent the body, said gathering means comprising a material engaging element having a shaft extending in a line parallel to the longitudinal axis of the cutting means and spaced and offset therefrom horizontally.

9. A mining machine comprising an elongated body having a motor and cutting means projecting horizontally longitudinally from one end thereof and having gathering means driven by said motor and extending adjacent one longitudinal side of the body, said gathering means comprising a material engaging element having a shaft extending in a line parallel to the longitudinal axis of the cutting means and spaced and offset therefrom horizontally.

10. A mining machine comprising an elongated body having a motor and cutting means projecting horizontally from one end thereof and having gathering means driven by said motor and extending adjacent the body, said gathering means comprising a material engaging element having a shaft extending in a line parallel to the longitudinal axis of the cutting means and spaced and offset therefrom horizontally, and conveying means between said engaging means and cutting means having a portion effective to convey material in a direction parallel to the length of the cutting means.

11. A mining machine comprising an elongated body having cutting means projecting horizontally from one end thereof and having gathering means extending adjacent the body, said gathering means comprising a material engaging element having a shaft extending in a line parallel to the longitudinal axis of the cutting means and spaced and offset therefrom horizontally, and conveying means between said gathering means and cutting means comprising an endless belt having a material receiving portion traveling substantially on a level with said engaging means and a delivering portion extending above the same.

12. A mining machine comprising a body slidable on the mine bottom and containing a motor, a cutter bar projecting at one end of the body, means carried by one lateral side of the body for engaging and moving loose material towards said side, means also carried thereby for receiving and conveying said material longitudinally of said side, and driving means between the motor and the cutter bar and material moving and conveying means respectively.

13. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism including a cutter bar projecting from said body, and material gathering and conveying mechanism movable with said body and driven by said motor, said mechanism being arranged wholly at the advancing side of said body for moving loose material out of the path thereof.

14. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism including a cutter bar projecting from said body, feeding mechanism for the machine including means for controlling the position of said body relative to the coal face, and conveying means movable with said body and driven by said motor, said

conveying means being arranged wholly at the advancing side of said body for moving loose material out of the path thereof.

15. A coal cutting and loading machine comprising an elongated body slidable on the mine bottom and containing a motor, cutting mechanism including an elongated cutter bar projecting longitudinally from one end of said body, and conveying means driven by said motor and arranged wholly at the advancing side of said body parallel with said cutter bar, said cutter bar and conveying means simultaneously engaging the coal as the machine is advanced laterally relative to the coal face.

16. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism including a cutter bar projecting from one end of said body, mechanism for feeding said body laterally with the forward longitudinal edge of said cutter bar engaging the coal, and conveying mechanism driven by said motor and arranged wholly at the advancing side of said body for moving loose material longitudinally thereof and out of the path of the same.

17. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism driven by said motor including a cutter bar projecting longitudinally of said body, and conveying means driven by said motor including an endless conveyor arranged wholly at the advancing side of said body for moving loose material longitudinally thereof and out of the path of the same.

18. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism driven by said motor including a cutter bar projecting from said body, feeding mechanism driven by said motor for moving said body laterally relative to the coal face, and conveying mechanism driven by said motor and arranged wholly at the advancing side of said body for moving the loose material out of the path thereof.

19. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism driven by said motor including a cutter bar projecting from said body, feeding mechanism driven by said motor for feeding the machine laterally relative to the coal face including feeding and controlling members cooperating with flexible feeding means, and conveying mechanism driven by said motor and arranged wholly at the advancing side of said body for moving the loose material out of the path thereof.

In testimony whereof I affix my signature.

CHARLES F. OSGOOD.

conveying means being arranged wholly at the advancing side of said body for moving loose material out of the path thereof.

15. A coal cutting and loading machine comprising an elongated body slidable on the mine bottom and containing a motor, cutting mechanism including an elongated cutter bar projecting longitudinally from one end of said body, and conveying means driven by said motor and arranged wholly at the advancing side of said body parallel with said cutter bar, said cutter bar and conveying means simultaneously engaging the coal as the machine is advanced laterally relative to the coal face.

16. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism including a cutter bar projecting from one end of said body, mechanism for feeding said body laterally with the forward longitudinal edge of said cutter bar engaging the coal, and conveying mechanism driven by said motor and arranged wholly at the advancing side of said body for moving loose material longitudinally thereof and out of the path of the same.

17. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism driven by said motor including a cutter bar projecting longitudinally of said body, and conveying means driven by said motor including an endless conveyor arranged wholly at the advancing side of said body for moving loose material longitudinally thereof and out of the path of the same.

18. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism driven by said motor including a cutter bar projecting from said body, feeding mechanism driven by said motor for moving said body laterally relative to the coal face, and conveying mechanism driven by said motor and arranged wholly at the advancing side of said body for moving the loose material out of the path thereof.

19. A coal cutting and loading machine comprising a body slidable on the mine bottom and containing a motor, cutting mechanism driven by said motor including a cutter bar projecting from said body, feeding mechanism driven by said motor for feeding the machine laterally relative to the coal face including feeding and controlling members cooperating with flexible feeding means, and conveying mechanism driven by said motor and arranged wholly at the advancing side of said body for moving the loose material out of the path thereof.

In testimony whereof I affix my signature.

CHARLES F. OSGOOD.

CERTIFICATE OF CORRECTION.

Patent No. 1,661,629. Granted March 6, 1928, to

CHARLES F. OSGOOD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 10, claim 4, strike out the words "the latter" and insert instead the words "said body"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 3rd day of April, A. D. 1928.

Seal.

M. J. Moore,
Acting Commissioner of Patents.

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