

T. E. SUFFOLK.
SHOVELING AND CONVEYING MACHINE.
APPLICATION FILED MAY 27, 1916.

Patented Dec. 4, 1917.
2 SHEETS—SHEET 1.

1,249,239.

Fig. 2.

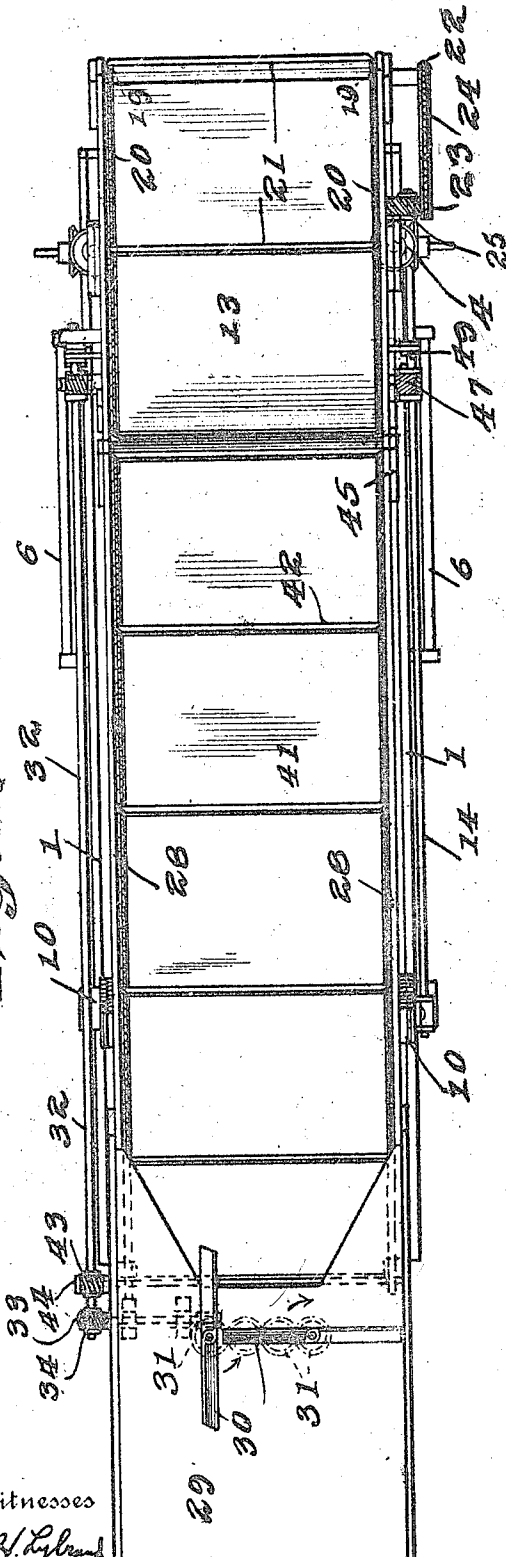


Fig. 4.

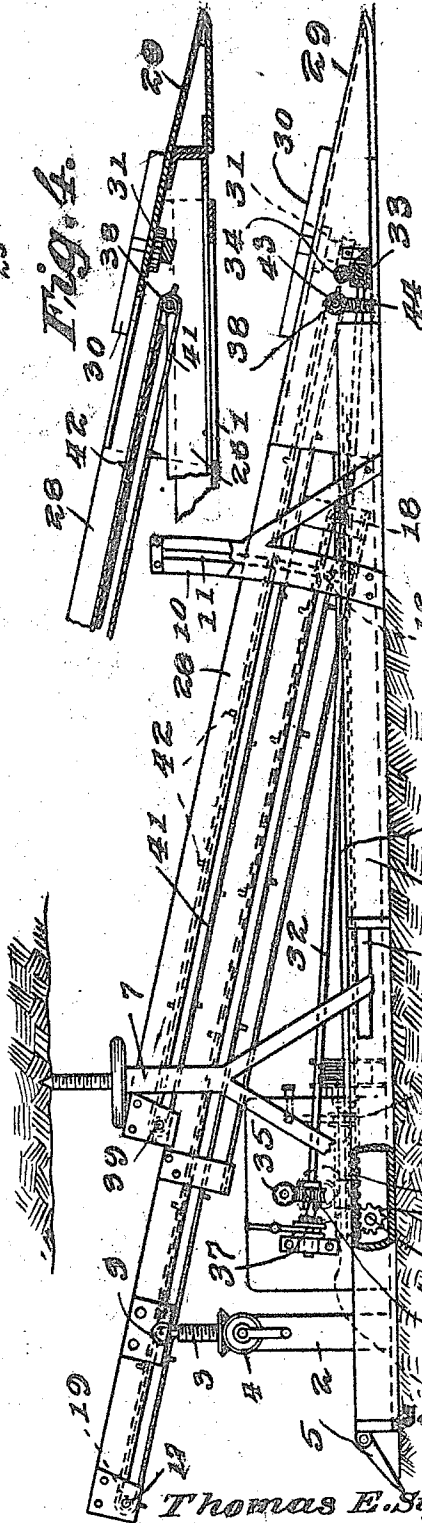


Fig. 1.

Witnesses
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2 SHEETS—SHEET 2.

Fig. 5.

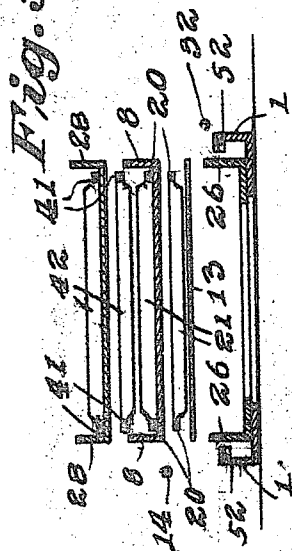


Fig. 3.

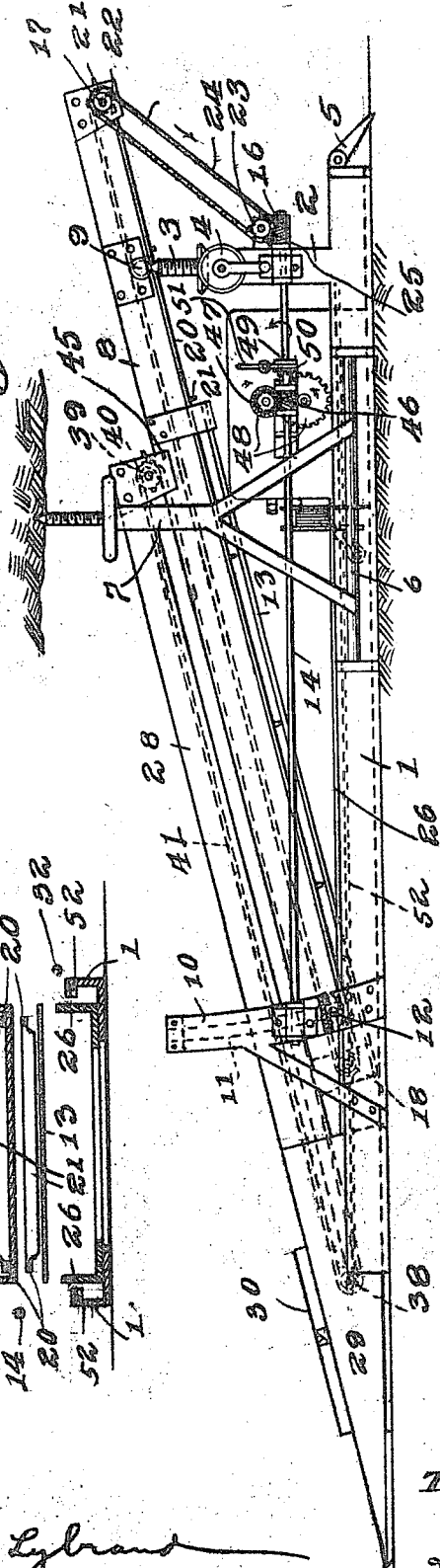
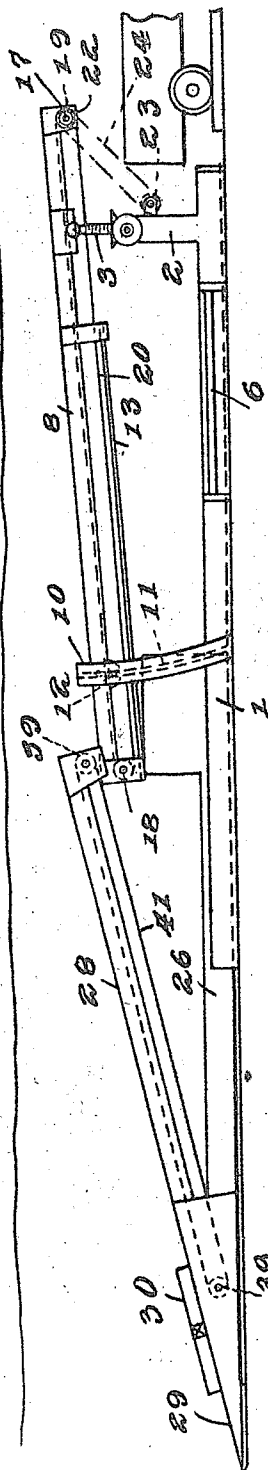


Fig. 6.

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UNITED STATES PATENT OFFICE.

THOMAS E. SUFFOLK, OF DONORA, PENNSYLVANIA.

SHOVELING AND CONVEYING MACHINE.

1,249,239.

Specification of Letters Patent.

Patented Dec. 4, 1917.

Application filed May 27, 1916. Serial No. 100,350.

To all whom it may concern:

Be it known that I, THOMAS E. SUFFOLK, a citizen of the United States, residing at Donora, in the county of Washington and State of Pennsylvania, have invented new and useful Improvements in Shoveling and Conveying Machines, of which the following is a specification.

This invention relates to machines especially adapted for shoveling and conveying coal at the mine and it consists in the novel features hereinafter described and claimed.

An object of the invention is to provide a machine of the character indicated adapted to be positioned upon the floor of a mine and which includes two frames movable with relation to each other there being a motor mounted upon one of the frames and operatively connected with means for advancing the machine at intervals or as desired. Endless conveyers are movably mounted upon each of the frames and means are provided for operating the said conveyers from the motor. The parts of the machine are so arranged that one of the conveyers may be raised or lowered as desired and inclined at a proper angle with relation to a horizontal. One of the said frames carries a shovel over which are turnably mounted sweeps adapted to be operated from the motor for the purpose of engaging the material and moving the same back along the shovel and depositing it upon the upper run of one of the endless conveyers.

In the accompanying drawings:—

Figure 1 is a side elevation of the shoveling and conveying machine.

Fig. 2 is a top plan view of the same.

Fig. 3 is a side elevation of the same looking at the opposite sides from that shown in Fig. 1.

Fig. 4 is a longitudinal sectional view of the forward portions of the machine.

Fig. 5 is a transverse sectional view of the machine.

Fig. 6 is a fragmentary side elevation of the machine showing the rear conveyer in an elevated position.

The shoveling and conveying machine comprises a frame 1 having jacks 2 mounted at the rear portion thereof. The said jacks 2 are provided with the usual movable bars 3 and means indicated at 4 for moving the said bars. One or more dogs 5 are mounted at the rear portion of the frame 1 and are downwardly and rearwardly inclined.

These dogs are adapted to engage the floor of the mine shaft or tunnel when the frame 1 is in position thereon and prevent rearward movement of the frame while the machine is in operation. Rods 6 are located at the sides of the frame 1 and are adapted to be engaged by fork members 7 for the purpose of securely holding the frame 1 down upon the floor of the mine's tunnel. The upper ends of the fork members engage the roof of the tunnel and hold the frame 1 in the position indicated.

A trough 8 is located above the frame 1 and the said trough is provided at its sides with pivot members 9 which rest upon the upper ends of the bars 3 of the jacks 2. Arcuate guides 10 are mounted at the forward portion of the frame 1 and at the sides thereof. The said guides 10 are provided with grooves 11 which receive outstanding studs 12 carried at the sides of the forward portion of the trough 8. If desired means may be provided for securing the studs 12 at any desired point along the grooves 11. The trough 8 is provided at its underside and in the vicinity of its forward end with a shield 13 which is spaced from the bottom of the said trough. A shaft 14 is journaled at one end upon one of the guides 10 and at its other end portion on one of the jacks 2. The said shaft 14 is square in transverse section, as shown in Fig. 5. A worm 16 is mounted or provided at the rear end of the shaft 14.

A shaft 17 is journaled for rotation at the upper rear end of the trough 8 and a shaft 18 is journaled for rotation at the lower forward end thereof. The said shafts carry sprocket wheels 19 around which are trained sprocket chains 20. The chains 20 are connected together by cross slats 21 which are adapted to move along the bottom of the trough 8 as the said chains move around the shafts 17 and 18. The upper runs of the chains 20 move along the upper surface of the trough 8 while the lower runs of the said chains move along the under surface of the bottom of the said trough and above the upper surface of the shield 13. Thus the said shield 13 prevents the lower runs of the chains 20 from sagging under the influence of gravity and interfering with the operation of the parts hereinafter described.

A sprocket wheel 22 is fixed to one end of the shaft 17 and a sprocket wheel 23 is journaled at the side of one of the jacks 2. A sprocket chain 24 is trained around the

sprocket wheels 22 and 23. A worm wheel 25 is fixed with relation to the sprocket wheel 23 and engages the worm 16 mounted upon the shaft 14.

5 A frame 26 is slidably mounted upon the frame 1 and a motor 27 of any desired type is mounted upon the rear end of the frame 26 and is located under the rear portion of the trough 8 hereinbefore described. An
10 upwardly and rearwardly inclined trough 28 is mounted upon the forward portion of the frame 26 and a shovel 29 is mounted at the forward end of the frame 26 in advance of the forward end of the trough 28.

15 Sweeps 30 are journaled for rotation upon the shovel 29 and their end portions are adapted to move over the upper surface thereof. Intermeshing gear wheels 31 are attached to the shafts of the sweeps 30 and
20 are located under the shovel 29. A shaft 32 is journaled upon the frame 26 and extends longitudinally thereof. The said shaft 32 is provided at its forward ends with a worm 33 which meshes with a worm wheel 34 carried by the shaft 1 of the sweeps 30. The
25 shaft of the motor 27 is provided with a worm 35 which meshes with a worm wheel 36 loosely mounted upon the rear portion of the shaft 32. A clutch member 37 is movably mounted upon the shaft 32 but constrained to rotate in unison with the same. The said clutch member may be moved into engagement with the worm wheel 36 where-
30 by the said shaft 32 is rotated from the motor 27. It is apparent that when the shaft 32 rotates the worm 33 engaging the worm wheel 34 rotates one of the sweeps 30 and inasmuch as the gear wheel 31 operatively connects both of the sweeps together
40 the said sweeps turn about the upper surface of the shovel 29 and are adapted to engage the material under which the shovel 29 passes and moves the same rearwardly into the trough 28. A shaft 38 is journaled
45 for rotation at the lower forward end of the trough 28 and a shaft 39 is journaled for rotation at the upper rear end of the said trough. Sprocket wheels 40 are mounted upon the shafts 38 and 39 and sprocket
50 chains 41 are trained around the sprocket wheels 40 upon the shafts 38 and 39. The sprocket chains 41 are connected together by slats 42. The upper runs of the chains 41 are adapted to move along the upper surface
55 of the bottom of the trough 28 while the lower runs of the said chains 41 are adapted to move along the underside of the bottom of the trough 28. A worm wheel 43 is mounted at one end of the shaft 38 and
60 meshes with a worm 44 mounted upon the intermediate portion of the shaft 32.

Consequently it will be seen that as the shaft 32 rotates rotary movement is transmitted to the shaft 38 which in turn moves
65 the chains 41 along the trough 28. The

trough 28 is provided at its sides and in the vicinity of its upper end with downwardly disposed lugs 45 which receive the edge portions of the sides of the trough 8 between them and hold the troughs 8 and 28 in
70 proper position with relation to each other.

A worm wheel 46 is loosely mounted upon the shaft 14 and is movable with the casing of the motor 27. A worm 47 engages the worm wheel 46 and is operatively connected
75 by a train of gear wheels 48 with the shaft of the motor 27. A clutch member 49 is slidably mounted upon the shaft 14 but is constrained to rotate in unison with the same by reason of the square configuration of the
80 shaft. A lever 51 is pivoted to the casing of the motor 27 and engages the member 49 and may be used for moving the same along the shaft 14.

The frame 1 is provided with gear teeth 52 and a shaft 53 is journaled upon the frame 26 and carries gear wheels 54 which mesh with the teeth 52. A transmission mechanism 55 is adapted to connect the
90 shaft of the motor 27 with the shaft 53 and the said transmission mechanism is provided with a clutch device indicated in general at 56 which may be operated to connect the shaft 53 with the shaft of the said motor.

When the machine is in operation the
95 frame 1 is secured at the floor of the tunnel as hereinbefore described and by manipulating the clutch member 56 the wheels 54 may be caused to move along the teeth 52 whereby the frame 26 is moved along the frame 1
100 so that the shovel 29 is properly positioned with relation to the material to be conveyed. During the movement of the frame 26 the wheel 46 is moved along the shaft 14 and when it is desired to cause the chains 20 to
105 move along the trough 8 the lever 51 is manipulated whereby the clutch member 49 is moved into engagement with the wheel 46. Therefore rotary movement is imparted to the shaft 14 which through the connecting
110 means with the shaft 17 hereinbefore described turns the shaft 17 and the chains 20 are moved along the trough 8. When the clutch member 37 is moved into engagement with the wheel 36 the shaft 32 is rotated
115 from the engine 27 which in turn rotates the sweeps 30 as hereinbefore described and rotates the shaft 38 whereby the chains 41 are moved along the trough 28. As the sweeps 30 come in contact with the material
120 which passes upon the upper surface of the shovel 29 the said sweeps force the material rearwardly into the trough 28 and the slats 42 engage the material and carry it up along the said trough. The material falls from the
125 upper end of the trough 28 into the trough 8 and is operated upon by the slats 21 and carried up and delivered at the upper end of the said trough 8. When the trough 28 is moved in a forward direction with relation
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to the trough 8 the forward end of the trough 8 may be swung up along the guides 10 and during this swinging movement the pivot members 9 rock upon the upper end of the bars 3 of the jacks 2. Thus the upper edges of the sides of the troughs 8 may at all times be received between the lugs 45 and the said troughs are restrained against lateral displacement with relation to each other.

Having described the invention what is claimed is:—

A machine of the character described comprising two frames, one slidable within the other, a motor mounted on the slidable frame, an inclined trough carried by the slidable frame, an inclined trough mounted

on the other frame and adapted to swing vertically to maintain engagement with the first mentioned trough, guides mounted upon the last mentioned frame for directing the vertically movable trough, said guides having contact with the sides of the first mentioned trough, conveyers mounted for movement upon the troughs, means for operating both conveyers from the motor and means adapted to be operated by the motor for moving the slidable frame with relation to the other frame.

In testimony whereof I affix my signature. 30
THOMAS E. SUFFOLK.

Witnesses:

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