

**No. 715,470**

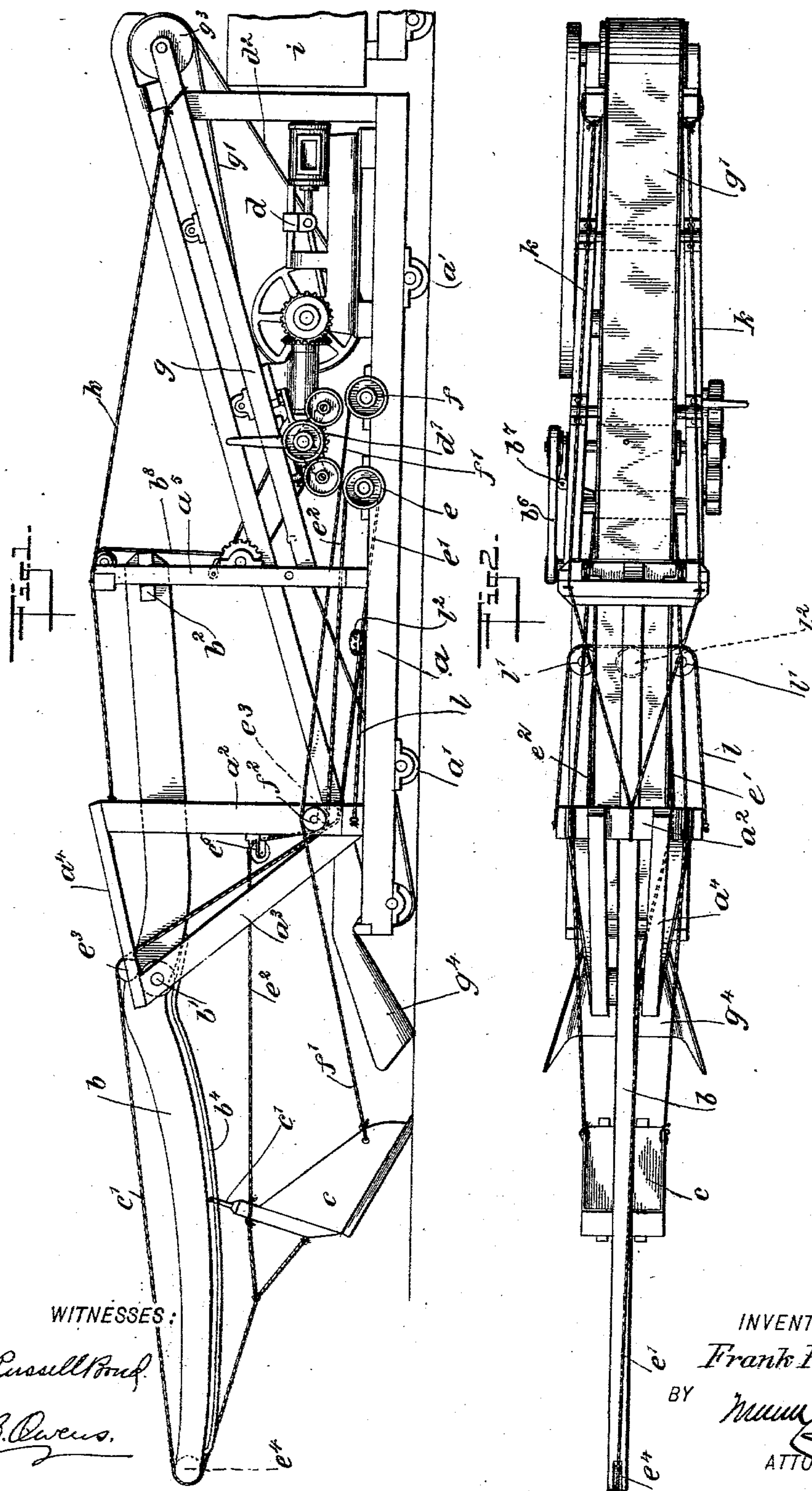
**Patented Dec. 9, 1902.**

**F. FRANZ.**  
**STEAM SHOVEL.**

(Application filed Oct. 21, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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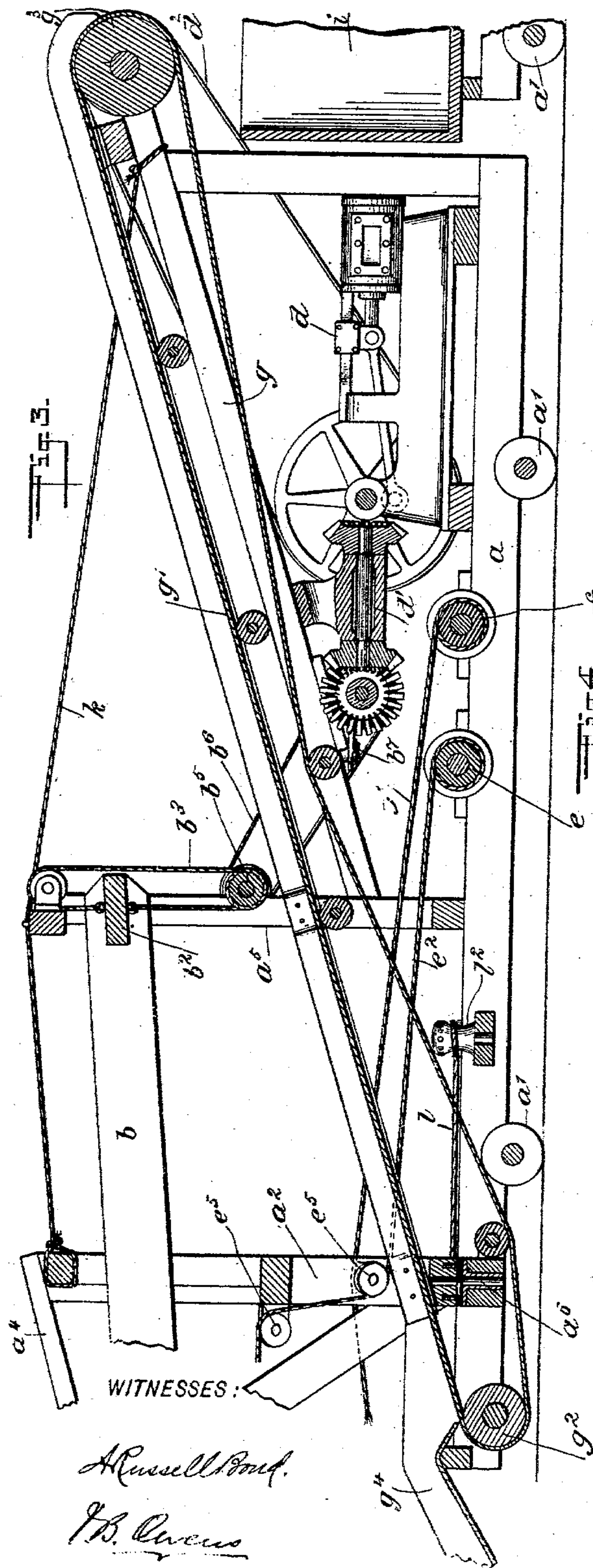
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2. Sheets—Sheet 2.





# UNITED STATES PATENT OFFICE.

FRANK FRANZ, OF WALLACE, IDAHO.

## STEAM-SHOVEL.

SPECIFICATION forming part of Letters Patent No. 715,470, dated December 9, 1902.

Application filed October 21, 1901. Serial No. 79,410. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK FRANZ, a citizen of the United States, and a resident of Wallace, in the county of Shoshone and State of Idaho, have invented a new and Improved Steam-Shovel, of which the following is a full, clear, and exact description.

This invention relates to a machine for shoveling and conveying earth, rock, and like substances; and it comprises certain novel mechanism, which will be hereinafter fully described.

This specification is a specific description of one form of the invention, while the claims are definitions of the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side view of the device. Fig. 2 is a plan view thereof. Fig. 3 is a section on the line 3 3 of Fig. 4, and Fig. 4 is an enlarged plan view of the invention.

The machine has a bed  $a$ , mounted, preferably, on wheels  $a'$ , so that it may be conveniently moved from point to point. On the bed  $a$  is erected a scaffold  $a^2$ , from the base of which projects a branch  $a^3$ , these parts  $a^2$  and  $a^3$  being connected at their upper ends by bars  $a^4$ . The branch  $a^3$  of the scaffold  $a^2$  has a boom  $b$ , pivoted therein at the point  $b'$ . The inner end of the boom  $b$  is forked to receive loosely a horizontal cross-head  $b^2$ . This cross-head is fitted to move vertically in a scaffold  $a^5$ , mounted on the bed  $a$ . The scaffold  $a^2$  is pivoted on the bed by means of a pin  $a^6$ . (Shown in Fig. 3.) Now owing to the arrangement of the parts  $a^2$ ,  $b$ ,  $b^2$ , and  $a^5$ , as described, the boom  $b$  may move in a vertical plane around its pivot  $b'$ , and it may also swing in a horizontal plane around the pin  $a^6$ . As the boom swings horizontally it slides on the cross-head  $b^2$ , and as it moves vertically it raises and lowers the cross-head in the scaffold  $a^5$ .

$b^3$  indicates ropes connected to the cross-head  $b^2$  and wound over a drum  $b^5$ , so that by turning the drum in one direction or the other the cross-head, and hence the boom, may be raised or lowered.

$b^6$  indicates a gearing for connecting the drum to the engine, and  $b^7$  indicates a friction-

clutch for starting and stopping the movement of the gearing. Thus by driving the drum  $b^5$  in the direction desired the necessary vertical adjustments of the boom may be effected.

On the boom  $b$ , at the outer part thereof, is a guide-bar  $b^4$ , which may be of any suitable form and which runs longitudinally along the under side of the boom and is slidably connected to an eye  $c'$  on the shovel  $c$ . By these means the shovel is mounted to travel back and forth along the boom from its outer end to the scaffold.

$d$  indicates an engine of any sort desired, which is mounted on the rear part of the bed and provided with a friction-gearing  $d'$ , by means of which two drums  $e$  and  $f$  may be driven at will in either direction.

I will not describe the details of the friction-gear  $d'$ , since this forms no part of my invention. Any suitable mechanism may be employed for the purpose so long as this mechanism will impart the above-described movements to the drums  $e$  and  $f$ . These drums  $e$  and  $f$  are mounted on the bed  $a$  on transverse axes. The drum  $e$  carries, as best shown in Fig. 1, two ropes  $e'$  and  $e^2$ . These ropes are wound oppositely on the drum. The rope  $e'$  runs over guide-rollers  $e^3$  to the outer end of the boom, where it passes around a guide roller or sheave  $e^4$  and runs inward to the shovel  $c$ , so that by winding up the rope  $e'$  the shovel is drawn outward along the boom. The rope  $e^2$  passes over guide-rollers  $e^5$  directly to the shovel  $c$ , so that by winding on the rope  $e^2$  the shovel may be dumped. The rope  $e^2$  is connected to the upper part of the shovel, so as to effect this dumping. It will be observed that when one of the ropes  $e'$  or  $e^2$  is wound on the drum  $e$  the other rope will be unwound. The drum  $f$  carries two ropes  $f'$ , which pass over guide-rollers  $f^2$  at each side of the scaffold  $a^2$  and are connected to the lower part of the shovel, so that by winding up the ropes  $f'$  the shovel will be drawn toward the machine.

Mounted on the bed and running from the base of the scaffold  $a^2$  upward and rearward thereon is the frame  $g$  of a conveyer  $g'$ . This conveyer may be any ordinary form of endless conveyer and runs over pulleys  $g^2$  and  $g^3$  at the respective ends of the frame  $g$ , the pul-



ley  $g^3$  being driven from the motor  $d$  by a belt  $d^2$  or other suitable connection. At the lower or receiving end of the conveyer is a boot  $g^4$ , up which the shovel  $c$  runs to dump its load 5 onto the conveyer. The conveyer discharges its load at its rear or high end, and a car or other receptacle for the material may be run under the conveyer, as indicated at  $i$ .

Suitable brace ropes or rods  $k$  are provided, 10 these ropes or rods passing from the upper end of the elevator-frame  $g$  to the scaffold  $a^2$  and connected centrally thereto, so as to permit turning of the scaffold as desired.

$l$  indicates a rope or chain connected to the 15 base of the scaffold  $a^2$  and passed over pulleys  $l'$  on the bed  $a$ . This rope or chain also passes over a capstan  $l^2$ , so that it may be actuated to turn the scaffold, and consequently the boom, as may be desired.

20 In the operation of the apparatus the gearing  $d'$  is so actuated as to drive the drums  $e$  and  $f$ , so that the shovel may be drawn back and forth along the boom. As the shovel, with its load, nears the bed of the machine 25 it rides up on the boot  $g^4$ , and then the movement of the shovel should be stopped and the rope  $e^2$  drawn to dump the shovel. Then by drawing on the rope  $e'$  the shovel may be returned for another load and its operation 30 thus continued. Meanwhile the conveyer  $g'$  is operating continuously to carry up the material and dump it from the high end of the conveyer, as will be understood.

Various changes in the form, proportions, 35 and minor details of my invention may be resorted to without departing from the spirit and scope of my invention. Hence I consider myself entitled to all such variations as may lie within the scope of my claims.

40 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a frame, a conveyer thereon, a boot at the base of the conveyer, 45 said boot slanting upward from the ground, a shovel, means for moving the shovel toward and from the boot, and a boom mounted on the frame above the boot, on which boom the shovel has sliding movement.

50 2. The combination of a frame, a conveyer thereon, a boot at the base of the conveyer, said boot slanting upward from the ground, a shovel, means for moving the shovel toward and from the boot, a boom mounted on 55 the frame above the boot, and a guide rod or bar on the boom, on which rod or bar the shovel is slidably mounted.

3. The combination of a frame, a scaffold 60 mounted to turn thereon on a vertical axis, a boom pivoted intermediate its ends on the scaffold to swing vertically, a vertically-movable cross-head mounted on the frame and with which the boom has sliding connection, and a shovel mounted on the boom.

65 4. The combination of a frame, a scaffold

mounted to turn thereon, a boom pivoted intermediate its ends on the scaffold, a cross-head mounted to move vertically, the cross-head lying essentially parallel to the pivot of 70 the boom, and one end of the boom having connection with the cross-head to slide along the same, and an excavating device mounted on the other end portion of the boom.

5. The combination of a frame, a scaffold 75 mounted to turn thereon, a boom pivotally mounted on the scaffold intermediate the ends of the boom, the boom swinging vertically, a vertically-movable cross-head mounted on the frame and with which the boom has 80 sliding connection, means for moving and adjustably holding the cross-head, and an excavating device working on the boom.

6. The combination of a frame, a scaffold 85 mounted to turn thereon, a boom pivotally mounted on the scaffold intermediate the ends of the boom, the boom swinging vertically, a 90 vertically-movable cross-head mounted on the frame and with which the boom has sliding connection, means for moving and adjustably holding the cross-head, and an excavating device working on the boom, the said 95 means for moving and adjustably holding the cross-head comprising ropes connected to opposite sides thereof, and a winding device for alternately drawing on the ropes.

7. The combination of a frame, a boom 100 mounted intermediate its ends to swing around either of two crossing axes, a cross-head mounted to move transversely of itself and lying approximately parallel to one of 105 said axes of the boom, one end of the boom being engaged with the cross-head to slide longitudinally thereof, and excavating devices coacting with the boom.

8. An excavating apparatus comprising a 105 frame, a motor arranged adjacent to one end thereof, haul mechanism located adjacent to the motor, a conveyer passing at an inclination upward from the base of the frame and 110 over the haul mechanism and motor, a boom mounted on the frame adjacent to the receiving end of the conveyer, a shovel carried on the boom, and connections between the shovel and the haul device.

9. An excavating apparatus having a frame, 115 a boom mounted thereon, a bar carried by the boom longitudinally thereof, a shovel having an eye permanently fastened thereon and slidably receiving the bar, and haul devices 120 connected to the shovel, said devices extending longitudinally of the boom to move the shovel along the bar of the boom.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK FRANZ.

Witnesses:

H. M. DAVENPORT,  
JOHN P. SHEEHY.