No. 650,198. Patented May 22, 1900.

W. SHANNON.

STEAM SHOVEL.

(Application filed Feb. 6, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

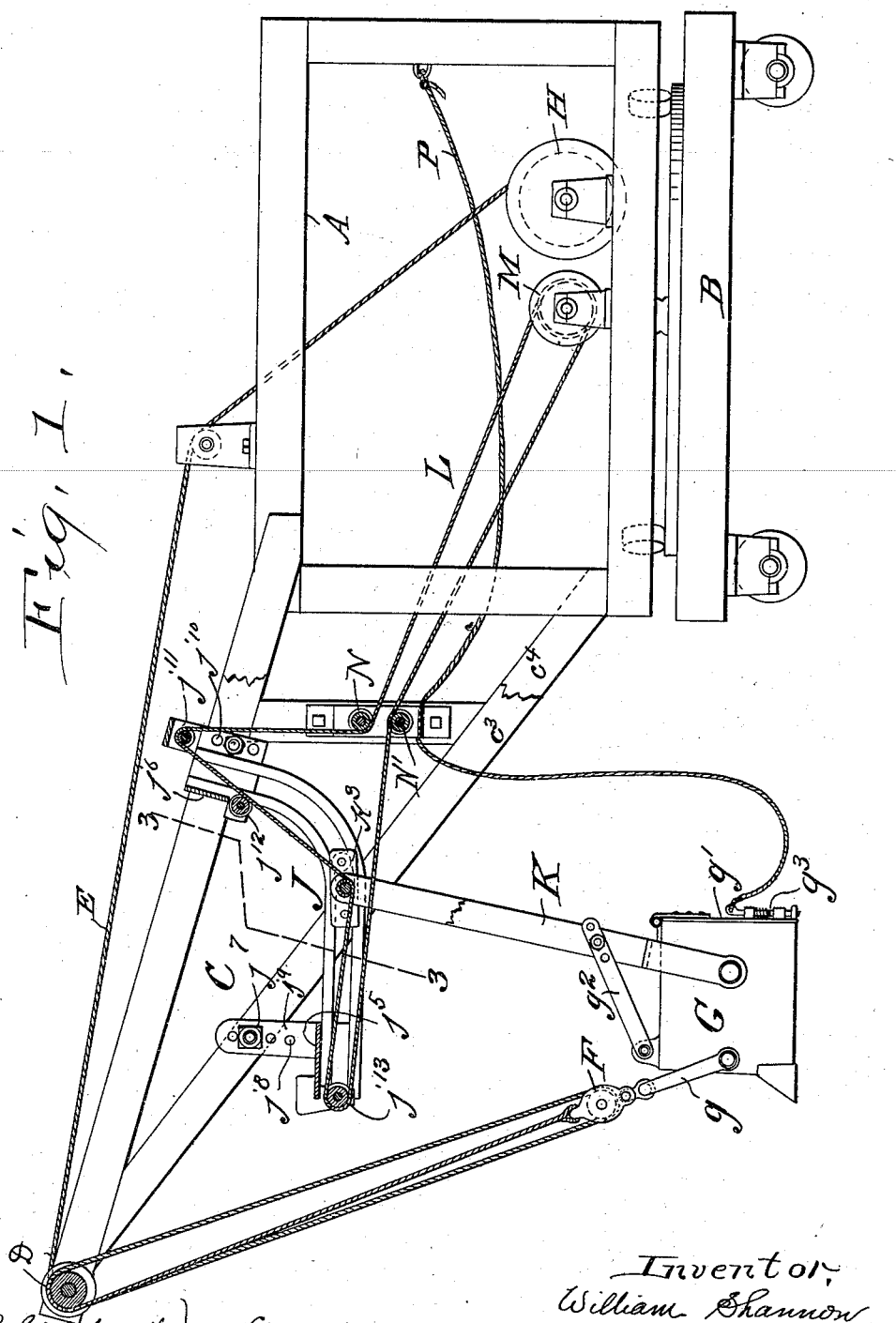

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Fig. 2.

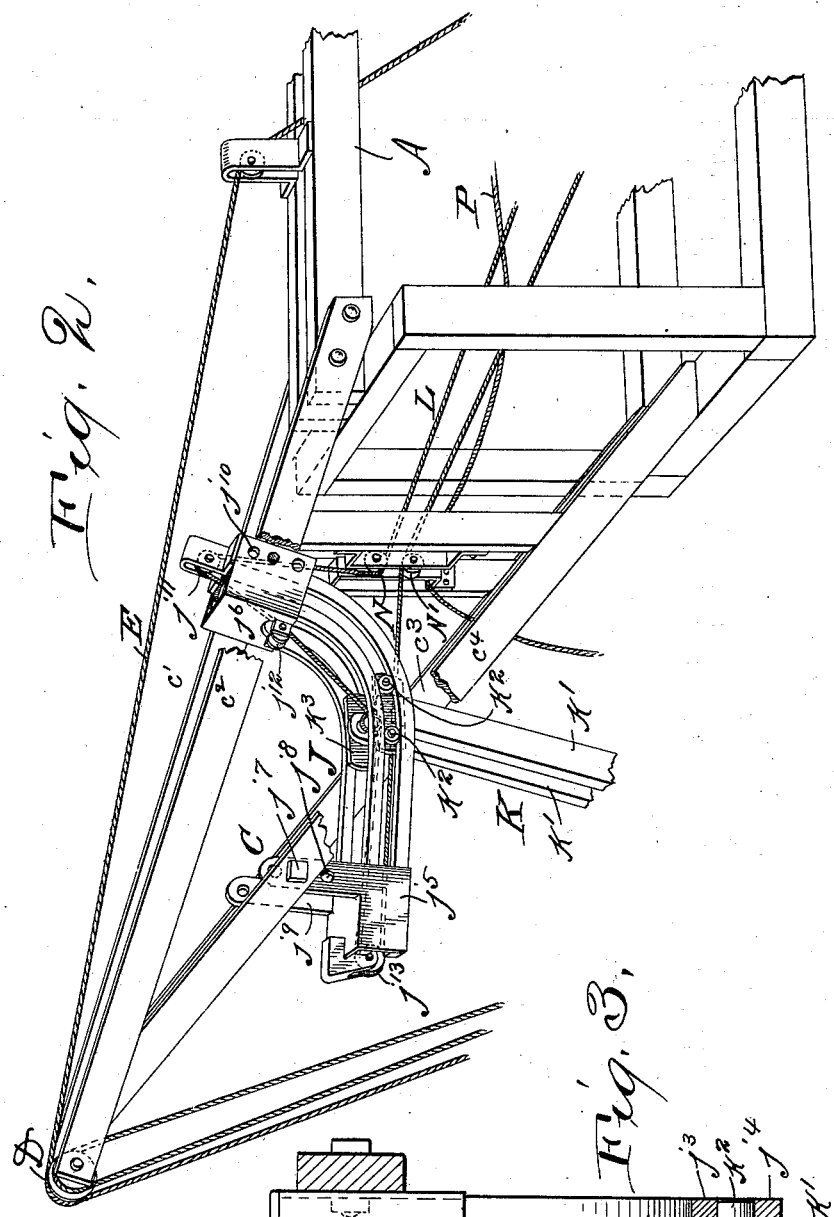
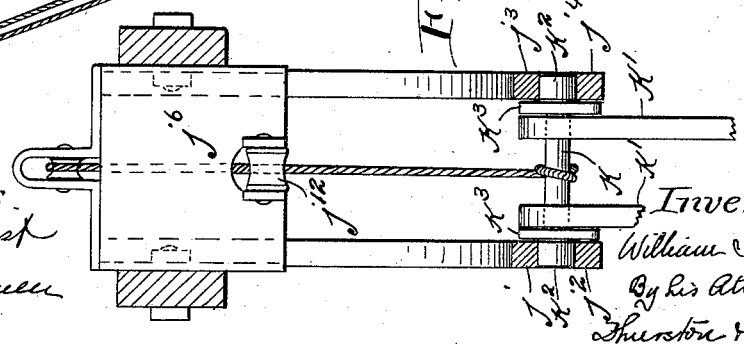


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM SHANNON, OF CLEVELAND, OHIO, ASSIGNOR TO W. J. TOWNSEND, TRUSTEE, OF SAME PLACE.

STEAM-SHOVEL.

SPECIFICATION forming part of Letters Patent No. 650,198, dated May 22, 1900.

Application filed February 6, 1900. Serial No. 4,182. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SHANNON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Steam-Shovels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

I designate my invention a "steam-shovel," which name I use as a generic term, including power-shovels, excavators, dredgers, and mechanically-operated scoops generally.

The object of the invention is to provide in a very simple and efficient form means whereby the scoop after discharging its load may be easily returned above the material to be excavated, thus having a sort of four-way motion traveling along a lower elevation, then being elevated to dump the load, then returning at an upper elevation, and coming back again behind the material.

The invention comprehends the means I employ for attaining this object both broadly and more or less specifically, as illustrated herein.

The invention may therefore be conveniently summarized as consisting of the combination of parts hereinafter specified, and definitely set out in the claims.

In the drawings, Figure 1 is a side elevation, partly sectional, of a steam-shovel embodying my invention. Fig. 2 is a perspective view of the derrick-arm thereof and the track carried thereby. Fig. 3 is a substantially-vertical section on the offset line 3 3 of Fig. 1.

The same letters of reference designate the same part in each figure.

A represents the frame of the machine, which is shown as journaled on a suitable king-pin and supported by rollers on a circular track carried by the usual truck B. Extending from the frame A is the derrick-arm C, built up of the four arms c' c^2 c^3 c^4 and suitable braces. These arms all come together at a point where the pulley D is journaled, over which extends the lifting-rope E. This rope passes through and has its ends secured to the tackle-block F, which is carried by the bail g of a shoveling member, as the bucket or scoop G. The cord E passes over a winding-drum H, carried by the frame, whereby the bucket is adapted to be drawn upward and forward.

The derrick-arms carry the curved track J, which is preferably made as shown, consisting of four bars j' j^2 j^3 j^4, arranged in pairs side by side and connected together at each end by suitable housings or boxes j^5 j^6. The housing j^5 is adjustably secured to the derrick-arms c^3 c^4 by bolts j^7, which may take into any of the holes j^8 in the ears j^9 rising from that housing. The housing j^6 is similarly secured to the derrick-arms c' c^2, holes j^{10} rendering the securement adjustable. There are thus provided by the two pairs of rails j' j^2 and j^3 j^4 two tracks side by side, the forward parts of which are horizontal, or approximately so, while the rear portion is curved upward, as shown. In each of the tracks take the two rollers k^2 k^2, carried by the bars k^3 k^3. These two bars k^3 are connected together by the pin k, on which are journaled the two arms k', which constitute the strut-arm K, the lower end of which is secured to the bucket, the two arms k' flaring and passing onto opposite sides thereof. A brace g^2 rigidly but adjustably secures the bucket to the arm K.

The arm K may be "racked" in or out or up the curve at the rear end of the track J by the racking-cable L. This is an endless cable secured to the reversible drum M, carried by the frame, and passes in contact with guide-pulleys N and N', supported by a beam of the derrick, and pulleys j^{11} j^{12} j^{13}, carried by the curved track, the former two by the housing j^6 and the latter by the housing j^5. Thus the pivot of the strut-arm K may be racked in or out, according to the direction of rotation of the drum M.

Assuming the parts to be in the position in Fig. 1, if the drum M be rotated to draw toward it the lower ply of the cable L and at the same time the drum H be rotated the proper amount to wind up the cable E the bucket may be caused to travel forward horizontally, the horizontality being varied, as desired, by winding up more or less of the cable E. When the upper end of the strut-arm K has reached the forward end of the

track C, the bucket is filled, and continued winding of the cable E elevates the loaded bucket, as desired. The whole shovel is then swung on the king-pin until the bucket is over the proper point to be dumped, when a pull on the releasing-rope P releases the spring-catch g^3, which normally locks the bottom g' to the bucket, thereby allowing the load to discharge. If the drum M is rotated in the opposite direction, the upper end of the strut-arm K is drawn backward, with the bucket elevated, and is drawn up the track at its curved portion as the bucket swings downward by the cable E being released. The pivot of the arm K being now elevated, however, the bucket may clear the material it is to excavate. Having cleared it, reverse rotation of the drum M and the weight of the bucket bring the latter into position for refilling. If the track be adjusted, as it may be, to have its straight portion inclining upward forward, gravity may be sufficient to bring the bucket back, the cables being simply released, and the momentum may carry the pivot of the strut-arm part way up the curve.

Having described my invention, I claim—

1. The combination of a suitable support, a shoveling member, a strut-arm therefor, a track along which said arm is adapted to travel, said track having its rear portion extending upward, and extending in a different direction from the forward portion, substantially as described.

2. The combination of a track having a forward portion and a rearward portion diverging therefrom, means for supporting said track with the forward portion approximately horizontal and the rear portion extending upward therefrom, a strut-arm guided in said track, and a shoveling member to which said strut-arm is connected, substantially as described.

3. The combination of a derrick-arm, a track carried thereby and having a straight portion approximately horizontal, a portion at the rear thereof extending upward, a pivoted arm guided by said track, a bucket to which the other end of the arm is secured, and suitable means for elevating the bucket and for moving the pivot of the arm in or out, substantially as described.

4. The combination of a suitably-supported track, a bucket, a rigid arm secured at one end to the bucket and at the other end guided in said track, said track having an approximately-horizontal portion and at the rear of this a portion extending upward, a winding-drum, a cable leading from each side thereof and secured to the pivot of the arm whereby that pivot may be racked in or out, and an elevating-cable connected with the bucket and with a suitable drum, substantially as described.

5. The combination of a track having a substantially-straight portion, and a curved portion at the rear thereof, said curved portion extending upward, means for supporting said track, a bucket, an arm secured at one end thereto, said arm having its other end guided by said track, substantially as described.

6. The combination of an adjustably-supported track having an approximately-horizontal portion and a portion at the rear thereof extending upward, a shoveling member, a strut-arm therefor guided by said track, a cable secured to a part movable with the strut-arm, means for moving said cable to shift the strut-arm, substantially as described.

7. The combination of a frame, a derrick carried thereby, a track carried by said derrick, said track being adjustably secured to the derrick, and extending upward at its rear portion, pulleys carried by said track, a bucket, a strut-arm therefor guided by said track, and a drum on said frame, a cable leading therefrom over said pulleys, and secured to a part movable with the strut-arm to rack it in or out, substantially as described.

8. The combination of a suitable support, a track consisting of four rails arranged in pairs side by side, said track extending upward in its rear portion, a bucket, a strut-arm secured thereto, two bars pivoted to the strut-arm, a pair of rollers carried by each bar and taking into tracks provided by the rails, substantially as described.

9. The combination of a suitable support, a track consisting of four rails arranged in pairs side by side, a bucket, a strut-arm secured thereto and consisting of two parallel bars flaring at one end and there secured to each side of the bucket, a journal-pin engaged by the other end of said two bars, said journal-pin carrying at each end a pair of rollers taking into the tracks, substantially as described.

10. The combination of two tracks consisting of four rails j', j^2, j^3, j^4, a housing at each end of the rails securing the four together, a suitable derrick-arm, means for adjustably securing said housings thereto, a shoveling member, a strut-arm therefor secured at one end to the shoveling member and at the other end to a journal-pin, said journal-pin carrying a pair of bars k^3, which bear against the said tracks, each bar carrying a pair of rollers k^2 which take into the tracks, pulleys carried by said housing, and a cable for racking in or out the strut guided by said pulleys and secured to a part movable with the strut-arm, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WILLIAM SHANNON.

Witnesses:

WM. T. COCHRAN,

ALBERT H. BATES.