(No Model.) 3 Sheets—Sheet 1.

W. DUNN & A. BECKERT.

MACHINERY FOR LOADING VESSELS WITH COAL AND IRON.

No. 260,007. Patented June 27, 1882.

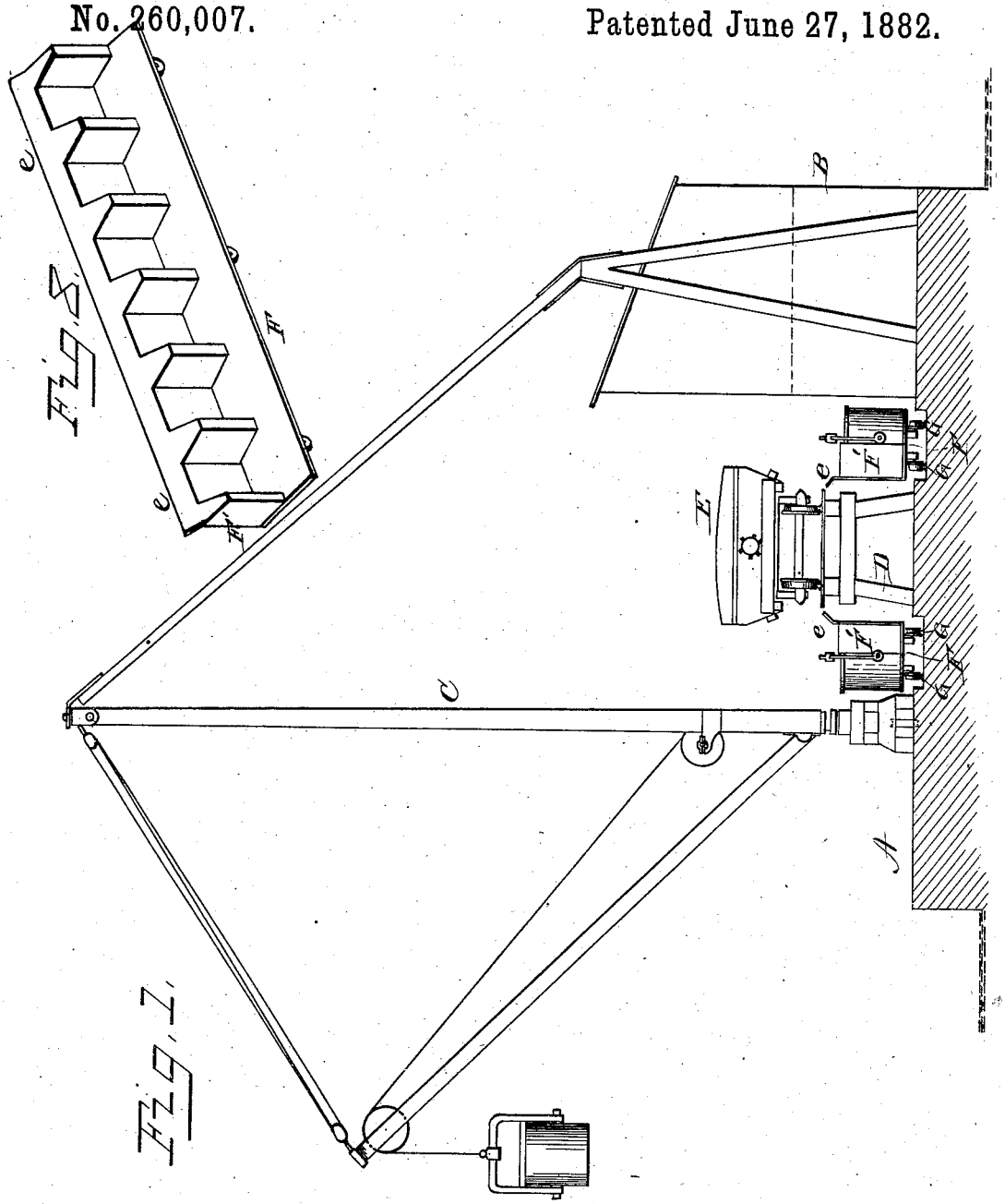

Fig. 2.

Fig. 1.

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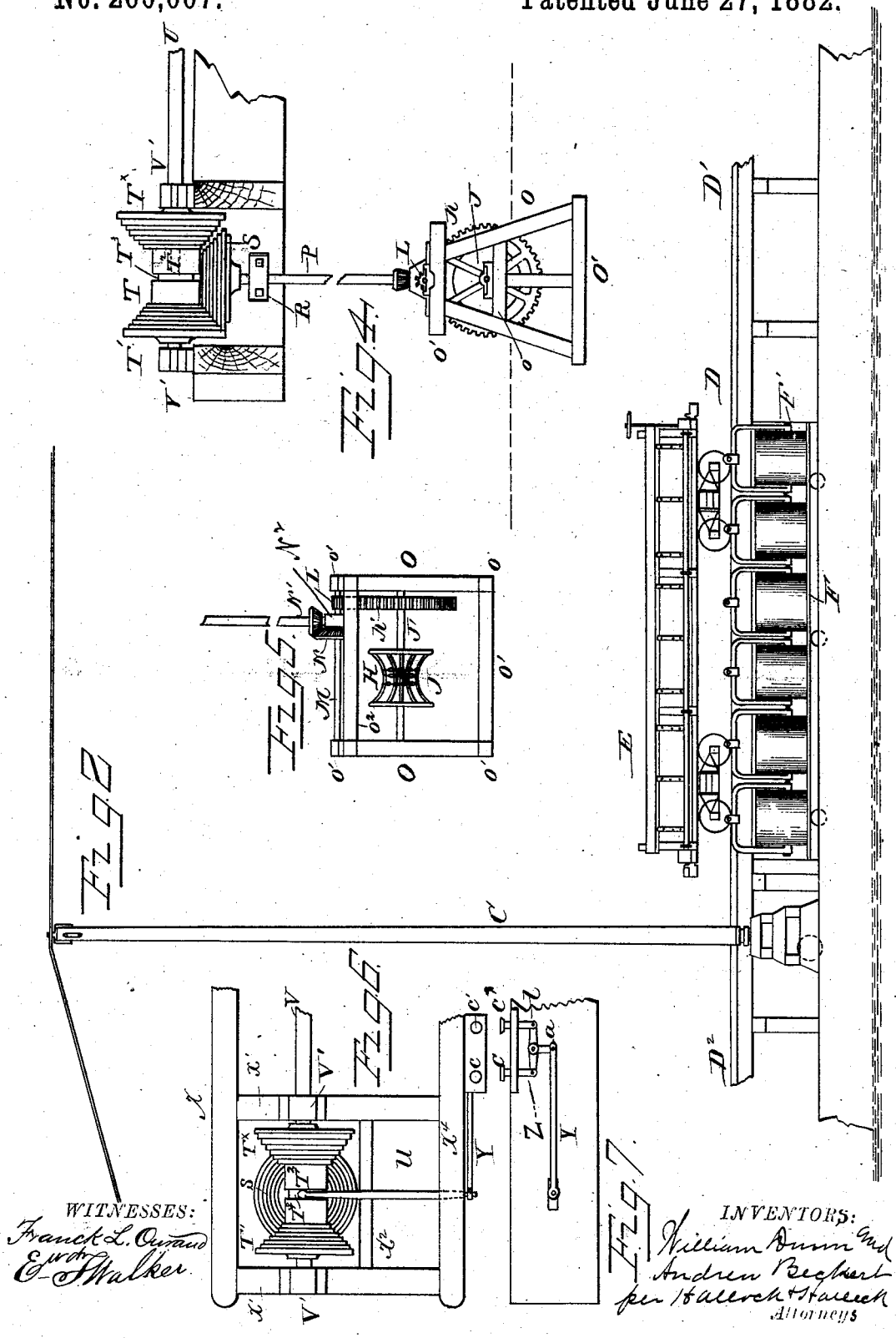

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(No Model.) 3 Sheets—Sheet 3.

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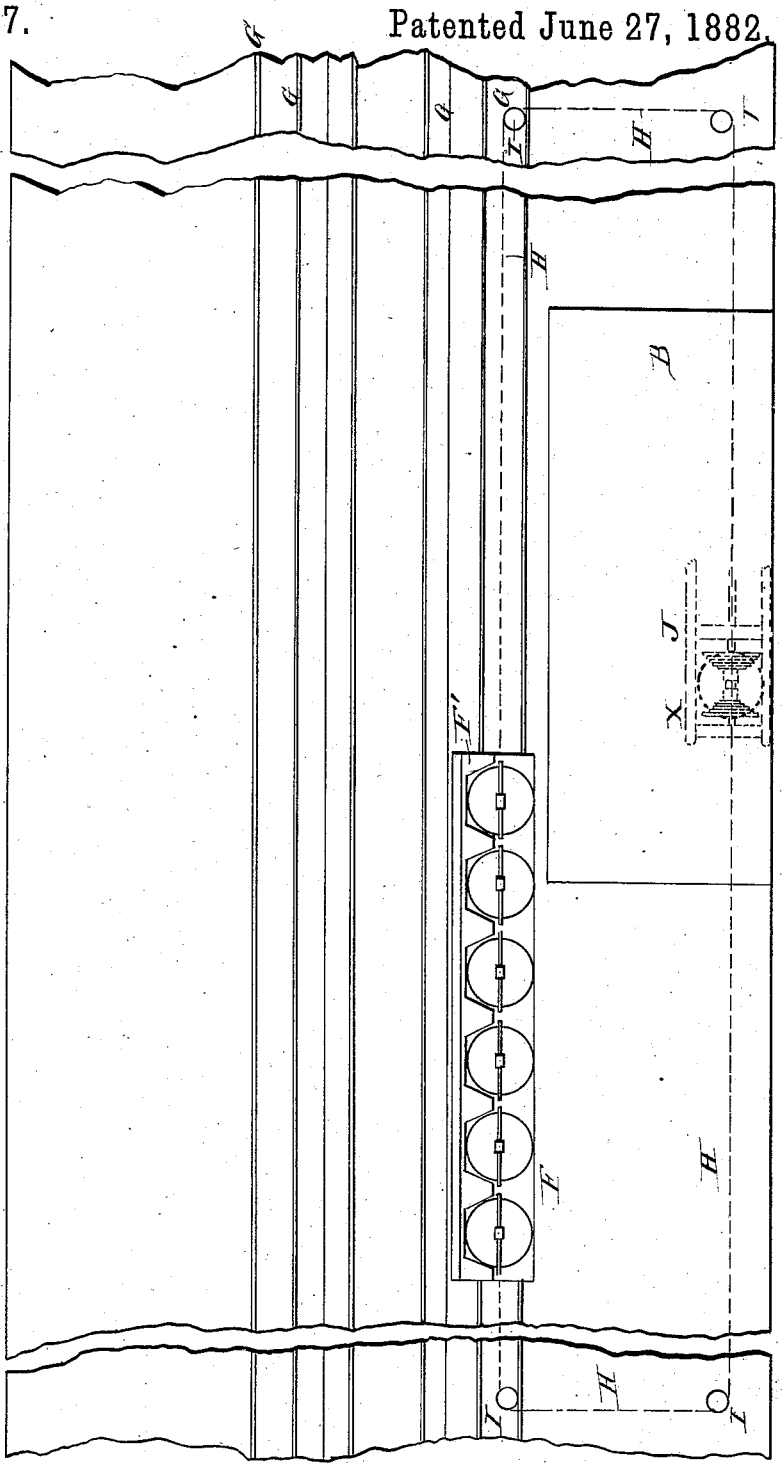

Fig. 5.

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UNITED STATES PATENT OFFICE.

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MACHINERY FOR LOADING VESSELS WITH COAL AND IRON.

SPECIFICATION forming part of Letters Patent No. 260,007, dated June 27, 1882.

Application filed April 21, 1882. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM DUNN and ANDREW BECKERT, citizens of the United States, residing at Zanesville and Sandusky, in the counties of Muskingum and Erie and State of Ohio, have invented certain new and useful Improvements in Machinery for Loading Vessels with Coal, Iron, &c.; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to improved arrangements for loading vessels with coal, iron ore, other minerals, and grain.

The object of the invention is to load vessels with great speed and a minimum amount of labor, and avoid the breaking of the material transferred into dust or small pieces. This is accomplished by providing means, which will hereinafter be described, whereby an operator can use his feet to work one portion of the device and his hand the other, so that one operator can superintend the loading of the buckets and the transfer of their contents to a vessel moored alongside of a wharf upon which the loading mechanism is arranged, all as will hereinafter be explained.

In the accompanying drawings, Figure 1 is an end elevation, showing wharf, derrick, inclined track, movable cars or platforms, and buckets or tubs in position to receive the load from the side-dump cars. Fig. 2 is a side elevation of the same. Fig. 3 is a plan of the same, showing position of the chain or rope used in moving the cars or platform. Fig. 4 is a side view of machinery to move cars or platforms. Fig. 5 is an end view of the same, showing drum upon which the rope or chain is wound. Fig. 6 is a plan of the same, showing the manner of applying the friction arrangement to move the cars or platforms. Fig. 7 is a side view of the same, showing pedal arrangement worked by the operator's feet. Fig. 8 is a perspective view of car F.

A represents a wharf; B, the derrick-house; C, the derrick, having suitable mechanism for moving the parts thereof and lifting and lowering the buckets; D, a trestle provided with trucks and inclined downwardly from point D′ to point D^2; E, a car having removable sides or doors; F, a car for carrying buckets mounted upon a track, G, placed parallel to the trestle; H, a cable attached to each end of the cars F and passing around rollers or sheaves I, placed substantially as shown in Fig. 3; J, a spool around which cable H is wrapped two or three times. The means for operating this spool, and its object, will hereinafter be explained.

As before stated, trestle D is inclined downwardly from point D′ to point D^2. The track D′ is continuous with the main track, (not shown,) so that loaded cars can be run from the latter to any point upon track D′ and dumped. After the contents are dumped the brakes are loosened and the cars allowed to run down the incline by their own gravity to make way for loaded cars. Upon each side of the trestle, and running parallel thereto, are tracks G G, upon which are placed cars F. These cars are provided with only one side, F′, that nearest the trestle. This side F′ is constructed with recesses or pockets, into which buckets or tubs, having suitable handles for lifting them, are placed. The top of this side is provided with a lip or flange, *e*, which inclines upwardly toward the trestle, and prevents the matter dumped from car E from falling in the space between the car and trestles and serves to guide it into the buckets. After the car E has been dumped, cars F are pulled, by means of cable H, to a point where the buckets can be lifted from the car by the arm of the derrick and swung to a vessel into which the contents of the buckets are dumped. These cars can be moved along track G the whole distance between the rollers or sheaves I, placed near the tracks. They may be operated independently of each other or made to move together by arranging suitable connecting-gear between the cables.

Cable H is held taut upon rollers or sheaves I by wrapping or coiling it around spool J in

such a manner that when spool J is revolved the cable will move in the direction the spool is revolving. Spool J is supported from the floor of the derrick-house by means of frame-work O, the parts O′ of which rest upon the floor. The journal J′ rests in bearings upon cross-pieces *o*. Upon the shaft is a gear-wheel, K, meshed with pinion L on shaft M, which is journaled in side pieces, *o*′, of the top O′.

At a suitable point upon shaft K is keyed a miter-wheel, N, which meshes with a miter-wheel, N′, the vertical shaft of which is journaled at its lower end in a block, N^2, supported from cross-pieces o^2 on frame-work O, and its upper part revolves in a bearing, R. At the upper end of shaft P is keyed or otherwise fastened the friction-wheel S, made of wood and secured with iron or other metal plates, and firmly bolted together. Around and above spool J is a frame, X, attached to the floor of the derrick-house. Upon cross-beams X′ X′ are placed bearings V′ V′ for shaft V. This shaft is connected to the engine that works the derrick, and is constantly revolving.

Upon the outer end, between cross-beams X′ X′, is a double friction-wheel, T, which revolves shaft P, that projects between the parts T' $T^{\times}$. A slot is formed in the bearing of this friction-wheel to receive a key fastened to the shaft, which keeps the wheel T constantly revolving, and at the same time allows it to be moved longitudinally the length of the slot in the bearing. These parts T' $T^{\times}$ are connected together by a shaft, T^2, which is slightly longer than the apex is broad of the conical friction-wheel S, so that either one of the parts T' $T^{\times}$ can be connected to said wheel or both entirely disconnected from said wheel S. The object of this construction is to revolve spool J in either direction to move car F by means of cable H, or to allow the car to remain stationary when wheel T is entirely disconnected from wheel S. These movements of friction-wheel T are accomplished by means of a forked lever, *u*, which embraces shaft T^2 in groove T^3, and is pivoted to cross-pieces X^2 at one side of the wheel T. The outer end of the lever is passed through a slot in part X^4, and connected to a rod, Y, which in turn is attached to the middle arm of a three-way lever, Z, pivoted at *a*′, and is worked by pedals *c* *c*′. When pedal *c*′ is used the lower end of lever *u* is drawn toward lever Z, and the upper end draws part $T^{\times}$ against wheel S and revolves shaft P in one direction. When pedal *c* is used part T' is drawn against wheel S and the motion reversed; or when the pedals are on the same plan neither part T' $T^{\times}$ is in contact with wheel S, and shaft P remains stationary.

The operation is as follows: A loaded car having side dumps is run up on the track on trestle D to a point between the platform-cars, which hold the buckets. The sides are then removed from the car, or, if only one track be used, one side of the car is removed, and the contents of the loaded car dumped into the buckets. The inclined lip *e* on the top of the side of the car F guides the matter into the bucket that would otherwise fall into the space between the car and trestle. The operator stationed in the derrick-house now presses his foot on pedal *c*′, and it, by means of lever Z, rod Y, and lever *u*, forces part $T^{\times}$ of the revolving friction-wheel T against friction-wheel S, and sets shaft P in motion, which shaft communicates its motion through bevel-gear N N′ to shaft M, which revolves spool J by means of pinion L and gear-wheel K. Spool J, in revolving, takes in cable H on one side and pays it out the other, and draws car F to a point where the arm on the derrick can be swung around and the buckets attached to the hook on the cable, which works in a sheave on the end of the arm. At the same time the foot is removed from the pedal *c*′, and friction-wheel T assumes a neutral position—that is, neither part T' nor $T^{\times}$ touches friction-wheel S. When this is accomplished the parts dependent upon wheel S for motion cease to move, and car F comes to a halt. After the buckets have been unloaded and replaced upon car F, pedal *c* is pressed, part T' on wheel T brought in contact with wheel S, the motion of spool J reversed, and the car F brought back to its former position by cable H, ready to have its buckets refilled. In the meanwhile empty dump-car E is allowed to run down the incline and a filled car pushed back into its place and the same operation performed.

It is obvious that much labor can be dispensed with, and that a single man can attend to the hoisting machinery and operate the gearing that moves the cars F.

What we claim as new is—

1. In a loading apparatus, the combination, with a trestle provided with a track for a dump-car, of a car provided with dumping-buckets and placed on tracks parallel to but below the level and to one side of the trestle, substantially as set forth.

2. In a loading apparatus, the combination, with a trestle having a track for a dump-car, of a car provided with dumping-buckets and placed on tracks parallel to but below the level of the trestle, and of derrick provided with mechanism for lifting the buckets and transferring them to another point, substantially as described.

3. In a loading apparatus, a car having recesses or pockets adapted to receive buckets, for the purpose set forth.

4. In a loading apparatus, a car having recesses or pockets adapted to receive buckets, and a lip, *e*, at the top of the recesses to serve as guides for the matter dumped in the buckets, for the purpose set forth.

5. In a loading apparatus, the combination, with a platform-car, of a cable working on four sheaves placed at the four corners of a square or rectangle and attached by its ends to the ends of the car, of a spool placed on the line of the cable, which is wrapped one or more times

around said spool, and of mechanism for revolving the spool, for the purpose set forth.

6. In a loading apparatus, the combination, with a trestle having a track therein, of a bucket-carrying car on tracks below the trestle and to one side thereof, of a cable attached to each end of the car and having a spool provided with mechanism for reversing the motion and stopping the car, and of a derrick adapted to lift the buckets from the car, carry them to a place to be dumped, and return them to said car, for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM DUNN.
ANDREW BECKERT.

Witnesses:
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E. B. SADLER.