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EXCAVATING AND LOADING APPARATUS.

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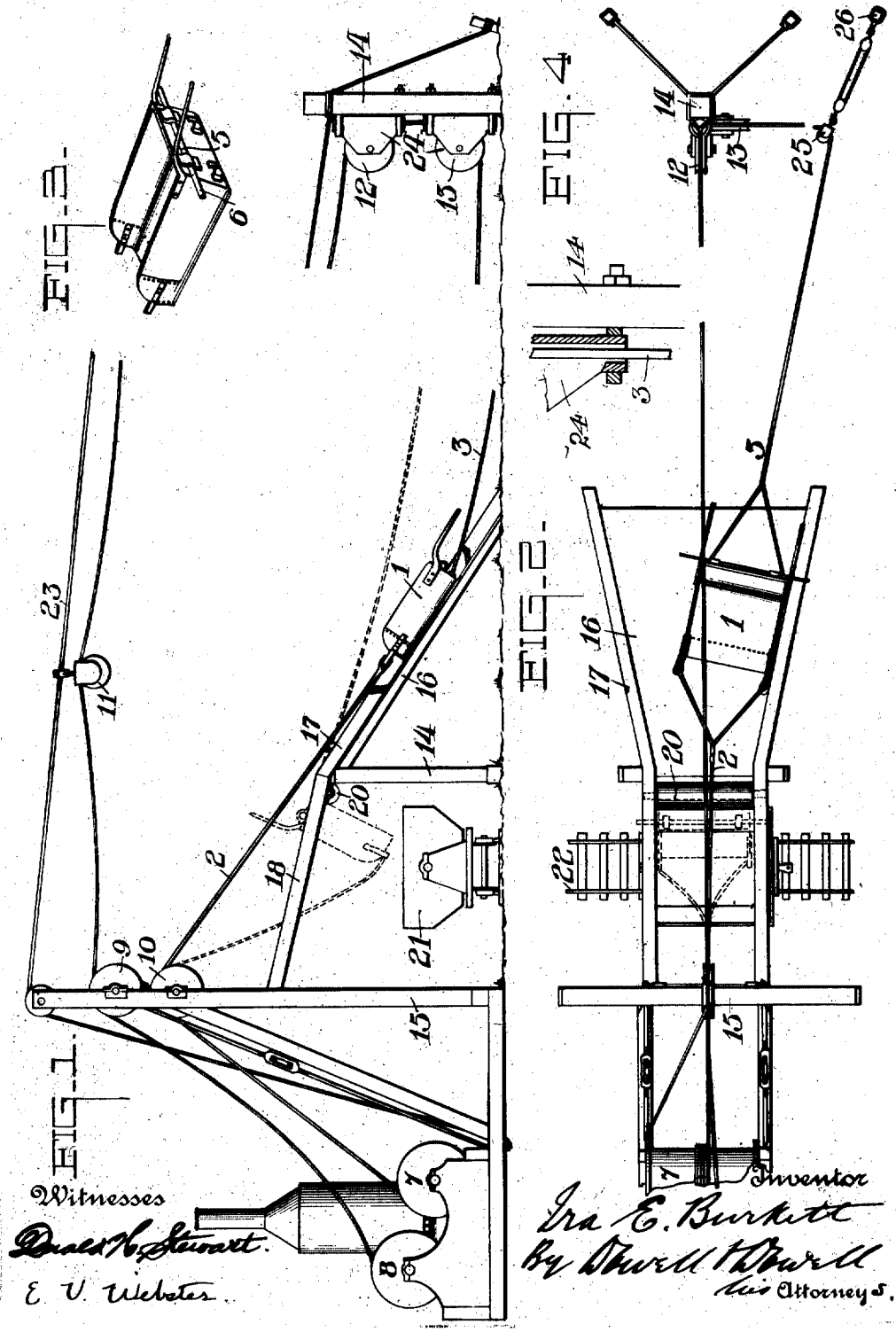

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Application filed November 25, 1910. Serial No. 594,194.

To all whom it may concern:

Be it known that I, IRA E. BURKETT, a citizen of the United States, residing at Macon, in the county of Bibb and State of Georgia, have invented certain new and useful Improvements in Excavating and Loading Apparatus; of which the following is a specification.

My invention relates to excavating and loading apparatus in which a scraper or scoop, operated by a power driven drum through draft-cables, is controlled for hauling the material directly from the excavation into cars or other conveyances or upon embankments, dams and like constructions in course of erection.

The invention pertains more particularly to that type of such apparatus in which the loading into cars or dumping upon embankments is accomplished by hauling the scraper up an incline and dumping it from the upper end of such incline by tilting the scoop.

The object of the invention is to improve the construction and increase the efficiency and convenience of operation of apparatus of the above noted character, and especially to provide improved means for controlling the dumping of the scraper or causing it to dump in the same position and easily returning it for reloading; also to adapt the apparatus for excavations of large areas without requiring removal from place to place.

An apparatus embodying my invention is illustrated in the accompanying drawings, which form a part of this specification.

Figure 1 is a side elevation showing the scraper on the forward haul and indicating the dumping operation by dotted lines. Fig. 2 is a top plan view. Fig. 3 is a detail perspective of the scraper. Fig. 4 is an enlarged detail sectional view of the lower end of the upper swivel pulley block.

The scraper 1 is operated by power through fore and aft draft-cables or the forward hauling cable 2 and the backing line 3. The forward hauling cable 2 is preferably connected to lugs 4, attached to and projecting beyond the point sides of the scraper, and consequently tends to raise the point and prevent accidental tripping or overturning of the scraper so that the full hauling power of the apparatus may be always utilized. A transverse rod 5 is attached at the back of the scraper and projects beyond the sides of the same, providing lateral arms or trunnion-like extensions 6, the function of which will be hereinafter explained. Suitable handles are or may be provided to enable the attendant to manipulate the scraper after loading or filling. The scraper is hauled back and forth for filling and dumping by the cables operated from power-driven drums 7 and 8. Said cables run over elevated pulleys 9 and 10, and the backing line which is carried over other suspended pulleys 11 is passed around adjustable or swivel pulleys 12 and 13 attached to the tail-post 14 at or near the rear end of the area being excavated.

For loading the material removed from the excavation into cars or dumping it upon embankments, the draft cables run over the aforesaid elevated pulleys 9 and 10, which are mounted in an A-derrick 15 or other suitable frame or scaffolding; and on the side of the derrick toward the place of excavation is constructed an incline 16 with lateral guides 17 from the upper end of which extend skids 18, made preferably as continuations of the guides 17. Said skids 18 are also preferably inclined, though in a less degree than the incline 16. The inclined platform 16 and skids 18 are erected upon suitable framework or uprights 19, and the skids 18 may terminate with and have their extremities attached to and supported by the derrick 15. At and just beyond the upper end of the incline, and between the skids, is a roller 20 over which the scraper passes in the act of dumping.

The car 21, or other conveyance into which the material removed from the excavation is to be loaded, may pass under the skids 18 on a suitable track 22 as shown and the operation of excavating and loading into the car will be performed as follows: The drum 7 being operated for winding up the forward hauling cable 2, while the drum 8 is released for letting out the backing line 3, the scraper on the forward haul fills itself, or is manipulated for filling by the attendant, and is carried onward and hauled up the incline 16 and over the roller 20 until the weight of the scraper and its contents beyond the roller overbalances the weight behind, whereupon the scraper will tilt downward and discharge its contents into the car or other receptacle, the tilting movement bringing the arms or trunnions 6 down upon the skids 18. Said

arms or trunnions 6, by resting upon the skids 18, catch and hold the scraper in the act of dumping, retaining it in such position that when its contents have been discharged it may be hauled back easily over the roller 20 and down the incline 16 for returning it to the place of excavation; the power drums 7 and 8 being reversed for pulling on the backing line 3. So the operation goes on. Thus the dumping of the scraper and restoring it to position for the backward haul is wholly automatic, and there is no possibility of the scraper falling out of proper position. Furthermore, as the dumping is effected by the scraper tilting or swinging downwardly and dropping its own load, no power is required for the dumping operation, wherein my invention has a great advantage over other excavating and loading apparatus in which the dumping is generally accomplished by lifting and overturning the scraper by leverage or by tripping the point of the scraper, requiring tremendous power and frequently resulting in the dropping or dislocation of the scraper and annoying and costly delays. The only power required is to haul the scraper to the dumping position, and, when it has discharged its load and been relieved of the weight thereof, to pull it back over the roller. Nor is there any chance of the scraper running backward before or after discharging, unless pulled back by the engine, for when the forward haul is carried to the proper point, the overbalancing of the forward part of the scraper immediately causes it to tilt downward and dump, and even if the pull of the forward hauling cable is released prematurely the scraper sliding on its own bottom will not descend the incline.

For excavating over large areas, the incline 16 is preferably made wider at the bottom, the guides 17 converging toward the upper end of the incline, and the backing line 3 is carried out of the way by the suspended pulleys 11 as already noted, said pulleys 11 being conveniently suspended from a stationary tight cable 23; and the pulleys 12 and 13 on the tail-post 14 are carried by pivoted pulley-blocks or swivel brackets 24 which automatically adjust themselves at any angle relative to one another, as required by the deflection of the backing line when excavating at either side of and at different distances from the tail-post. When excavating toward either side of the tail-post, the backing line is carried around a guide pulley 25 connected by block and tackle to a stationary stake 26 which may be set at various positions; and the position of said guide pulley 25 may be adjusted at will for the purpose of deflecting the cable and getting the scraper to any point as required. The said swivel brackets or pivoted pulley-blocks 24 are or may be journaled in eye-bolts attached to the tail-post, and the adjacent ends of said swivel brackets are cored out axially to provide guides for the passage of the cable 3 therethrough. By this construction the relative adjustment of the pulleys 12 and 13 at any angle does not interfere with the proper and easy running of the cable. With the apparatus thus arranged, excavations covering an area of an acre or more have been carried on without requiring any removal or adjustment of the apparatus, except changing from time to time the location of the guide pulley 25 by means of the block and tackle.

I reserve the right to such modifications in details of construction and arrangement as may be included within the scope of my invention as set forth in the following claims.

The term "power operated" in the claims is intended to extend to the use of manual power as well as an engine or motor for operating the draft-cables.

I claim and desire to secure by Letters Patent:

1. An excavating and loading apparatus comprising a frame having an upwardly inclined platform, a derrick arranged adjacent and spaced from said frame, a pulley on said derrick, a scraper, a cable secured to the scraper and passing over said pulley to draw the scraper up the platform, skids extending from the upper end of the platform at the sides of the same to the derrick at a less inclination than the frame, and a cross-bar secured across the rear end of the scraper and projecting beyond the sides of the same and adapted to impinge upon the skids when the scraper is dumped to support the scraper in a dumping position.

2. An excavating and loading apparatus comprising a frame having an upwardly inclined platform, a derrick arranged adjacent and spaced from said frame, a pulley on said derrick, a scraper, a cable secured to the scraper and passing over said pulley to draw the scraper up the platform, skids extending from the upper end of the platform at the sides of the same to the derrick at a less inclination than the platform, a transverse roller mounted in and extending between the skids immediately adjacent the upper end of the platform over which the scraper swings when dumping or returning to the platform, and a cross bar secured across the rear end of the scraper and projecting beyond the sides of the same and adapted to impinge upon the skids beyond the roller when the scraper is dumped, to support the scraper in a dumping position.

3. An excavating and loading apparatus comprising posts spaced apart, a supporting cable secured to and extending between said

posts, fixed pulleys suspended from said cable, an inclined platform arranged adjacent one of said posts and spaced therefrom, skids extending between the upper end of the platform and said post, power mechanism disposed adjacent said post, a scraper adapted to travel over the platform and dump between the skids, pulleys on the post, a hauling cable secured to the front end of the scraper and passing to the power mechanism over the pulley on the post adjacent the platform, and a backing cable secured to the rear end of the scraper and passing from the power mechanism over pulleys on both posts and suspended from the supporting cable.

4. In an apparatus for excavating and loading or other purposes, the combination with a power-operated scraper or scoop having a forward hauling cable and a backing cable, of self-adjusting pulleys around which the backing cable passes, said pulleys having pivoted pulley-blocks or swivel brackets, the adjacent ends of which are cored out axially to provide guides for the passage of the cable therethrough.

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

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Witnesses:

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