

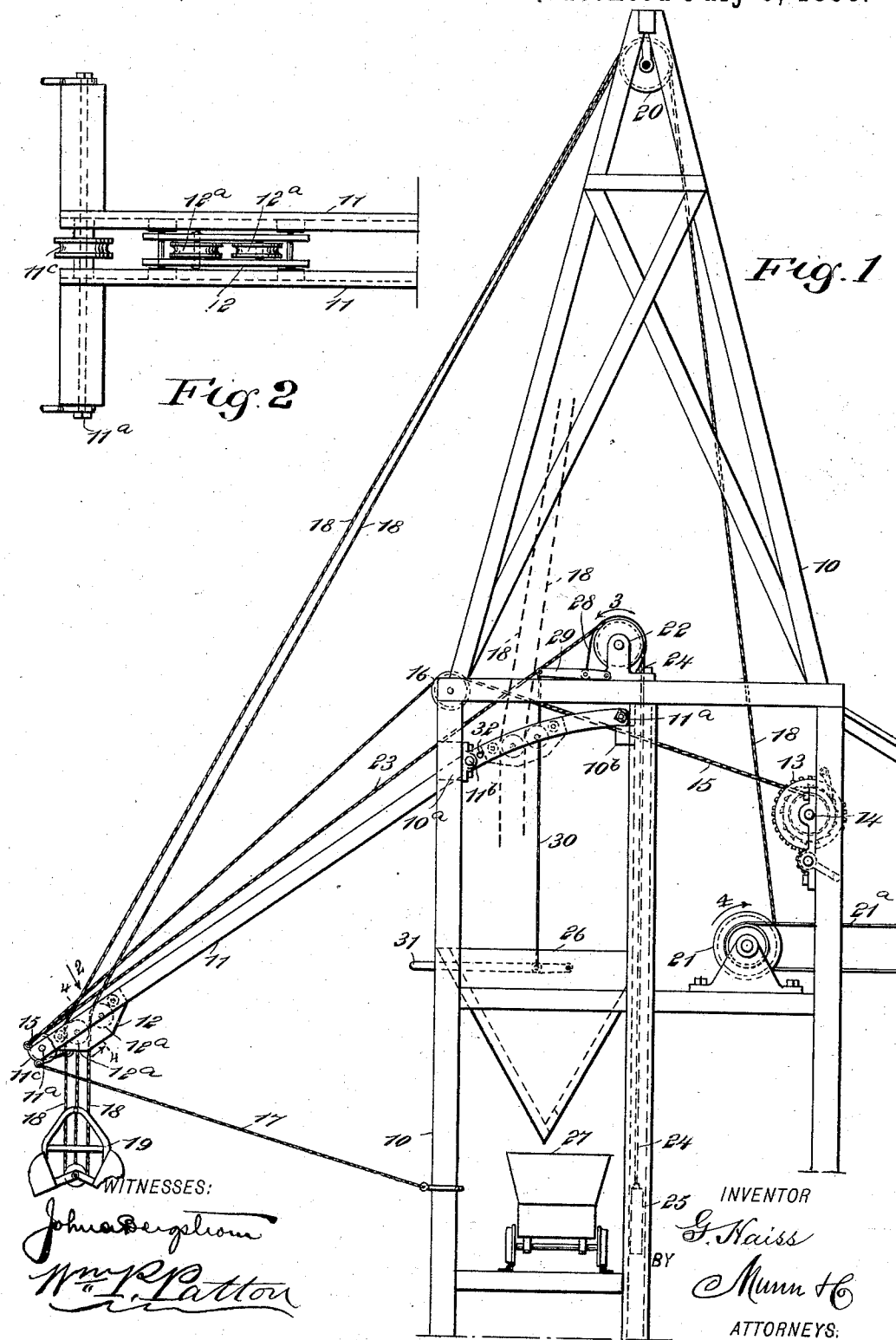
(No Model.)

2 Sheets—Sheet 1.

G. HAISS.
COAL ELEVATING APPARATUS.

No. 542,558.

Patented July 9, 1895.



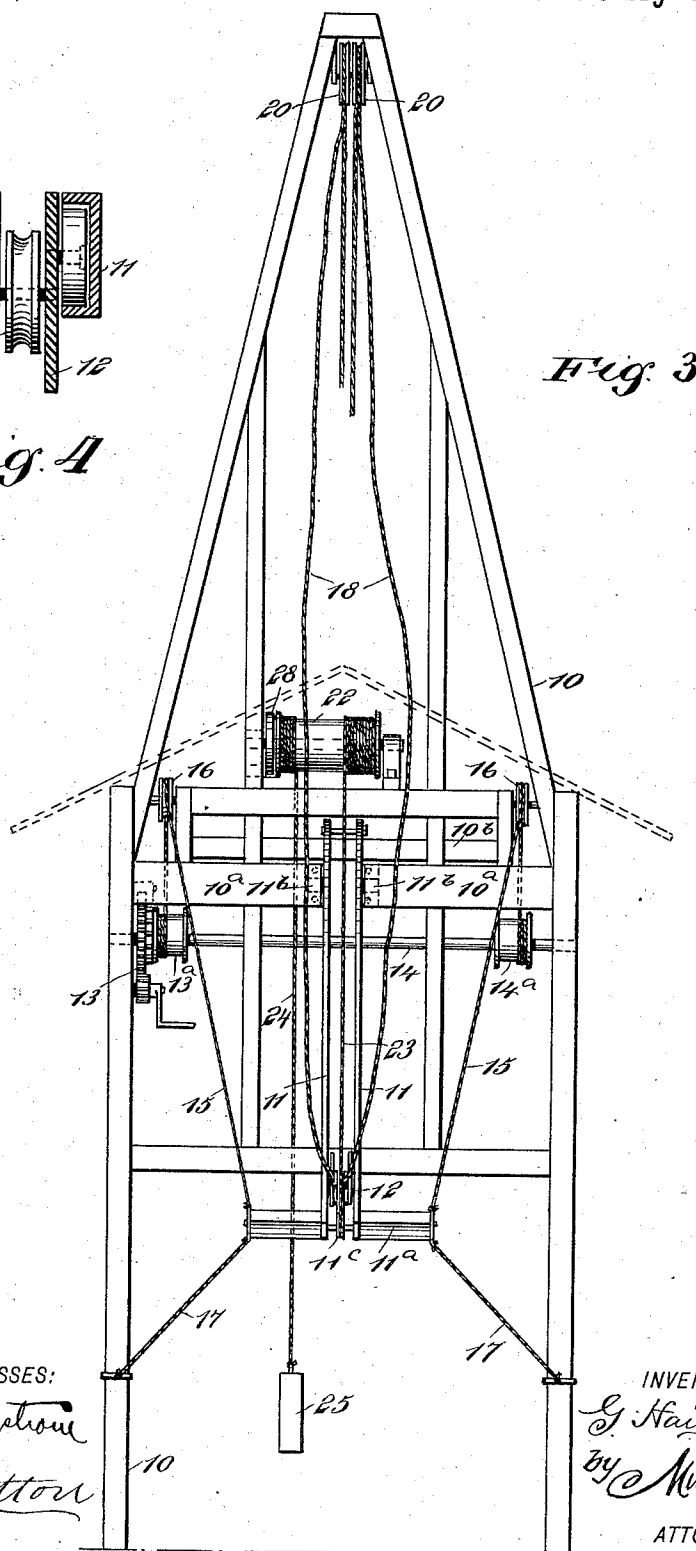
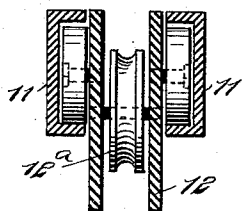
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WITNESSES:

WITNESSES:
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GEORGE HAISS, OF NEW YORK, N. Y.

COAL-ELEVATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 542,558, dated July 9, 1895.

Application filed January 14, 1895. Serial No. 534,852. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HAISS, of New York city, in the county and State of New York, have invented a new and Improved

Coal-Elevating Apparatus, of which the following is a full, clear, and exact description.

This invention relates to an improved apparatus for the elevation of coal or other lumpy or granular material from a lower to a higher plane, and particularly to such devices for the designated purpose as are used to raise coal from boats along a wharf or the bank of a river or other water-course, and discharge the coal as elevated into a car or other receptacle. Ordinarily a jib-beam is rigged to swing from a fixed support at a suitable elevation, so that it may be projected over a boat and afford support for blocks and falls that are utilized for the elevation of a coal-scoop which has been lowered into the boat and filled with coal.

The operation of handling coal by the use of the ordinary device that has been explained is slow and tedious, and as the jib must for security and its free operation be fixed in about a horizontal position it is liable to interfere with the subsequent movement of sailing-craft along the wharf, unless the jib-beam is removed, which requires time and labor to effect.

One object of the invention is to provide a novel simple apparatus, the elevator portion of which can be quickly projected over the coal to be lifted or be readily removed therefrom, the apparatus being placed on a fixed structure at a wharf or other point convenient thereto, so that the vessel from which coal is to be removed by means of the improved mechanism can be located near the wharf.

A further object is to provide an adjustable support for an automatically-filling coal-shovel, which support is adapted for convenient and safe actuation and control by steam or other power for the elevation of the filled shovel, its assured support during elevation, and a conveyance of the full shovel over a hopper or other receptacle for discharge of the contents of the shovel into said hopper, the movement of the shovel to fill it, transfer, and empty it being fully under control of the operator, who at will can lower the shovel for a refilling of the same.

To these ends the invention consists in the construction and combination of parts, as is hereinafter described, and indicated in the claims:

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

Figure 1 is a side elevation of the improved hoisting apparatus, portions of the supporting-frame being removed. Fig. 2 is an enlarged plan view of details of construction, comprising a movable truck and a portion of the trackway that supports said truck, seen in direction of the arrow 2 in Fig. 1. Fig. 3 is a front view of the elevating apparatus, the lower portion of the frame being removed and the elevator-shovel also removed to render other parts more distinct; and Fig. 4 is an enlarged transverse sectional view on the line 4 4 in Fig. 1.

In carrying the invention into effect an upright frame structure or derrick 10 is provided, which is made of any suitable material and afforded a sufficient height for the proper operation of other parts that constitute the main features of the invention. A portion of the framework 10 may be that of an inclosed building and have a roof provided for the protection of working mechanism that is supported on the frame below the roof, as indicated by dotted lines in Fig. 3. The structure or derrick-frame 10 is erected at a point close to the water if the apparatus is to be used for the removal of coal from a boat, and at the side nearest to the water an adjustable trackway is located on the derrick-frame.

It is preferred to construct the trackway of two iron or steel channel-beams 11, the flanges of the beams projecting toward each other, and the beams are connected at each end by bolts 11^a, which hold the channel-beams in a correctly-spaced condition, so that a small truck 12 may be introduced between the beams 11 and loosely engage its wheels with the flanges of said channel-beams. The beams 11 are slightly curved edgewise near the end of the trackway which is innermost in service and the beams are pivotally supported at a point near the inner extremity of the same. Preferably the trackway is supported free to receive adjustment by pivot-trunnions 11^b,

which are sustained by brackets on two aligned cross-beams 10^a, which are braced by other parts of the frame 10, so as to be adapted for the reliable support of the trackway and any load it may be required to bear. The two beams 10^a are so separated at their inner ends that the trackway may be rocked between said ends; but this may be readily changed by providing higher brackets for the trunnions, so that a continuous cross-beam may be employed in place of the pair of aligned and separated beams.

The convex curved edge portions of the beams 11 are uppermost in use, and for efficient operation means are required to allow of the inclination and reliable support of the trackway at an angle from a vertical plane that will best suit the requirements of its service as a support for the elevating device proper.

While various means may be utilized for the adjustable inclination of the trackway-beams 11 on their pivot-supports, for convenience and reliability the appliance shown is preferred, which consists of the following-described parts: A winch 13 of any approved construction is secured on the frame 10, having its drum 13^a supported on a transverse shaft 14, journaled in boxes at each side of the frame 10, and on the drum-shaft, near its opposite end, another drum 14^a is secured, as shown in Fig. 3. Two wire ropes 15, or other suitable flexible connections, are provided, said ropes being attached at one end to the winch-drums 13^a 14^a, their opposite extremities being secured to the outer end of the trackway-beams 11 or to lateral projections therefrom, the ropes receiving support intermediately of their ends upon the pulleys 16, mounted on the frame 10, near each side of the same, as shown in Fig. 3.

It will be evident that a rotation of the winch-drums by a proper manipulation of the winch will cause a movement of the trackway-beams 11 to elevate their outer ends, an opposite movement permitting the gravity of the projecting trackway portion to depress said trackway and cause it to assume a normal position.

A transverse beam 10^b is so located on the frame 10 that it will receive the impinge of the inner end of the trackway when the latter has been given a correct inclination for service, and will afford a stable support for said end of the trackway, and if the ropes 15 are drawn taut and so retained by the usual ratchet-and-pawl device of the winch the trackway will be reliably secured in a desired position for use.

As a further means for the support of the trackway, so as to prevent a lateral swaying movement of its outer end when adjusted as has been explained, two guy ropes or chains 17 are extended downward and laterally from its outer end or from lateral projections on said end having their opposite extremities fastened to the sides of the frame 10 or to other

fixed supports, these latter-mentioned points of attachment being below the outer end of the trackway when it is correctly inclined. The length of the guy-ropes is so proportioned that said ropes will be drawn taut when the winch-ropes 15 are in a similar condition, so that the trackway will be laterally supported by the guy-ropes when parts of the apparatus are adjusted for use, as represented in Figs. 1 and 3.

The small truck 12, which is designed to travel in or on the trackway-beams 11, is provided with four wheels of an equal diameter, and they are so sized that they will roll on the lower flanges of the beams and nearly touch the upper flanges of the same, the last-mentioned flanges serving to prevent an upward displacement of the truck when in service.

Between the pairs of wheels on the truck-frame which travel on the trackway-beams two grooved pulleys 12^a are mounted intermediately of the sides of the truck-frame, as clearly shown in Figs. 2 and 4, and on these pulleys two similar hoisting-ropes 18, preferably formed of wire strands, are imposed. The ropes 18 pass down through the frame of the truck 12, and have their depending ends secured to the elevating-shovel 19, and the latter is preferably of a type which is adapted to scoop itself full when two sections of the same are actuated by draft-strain applied to the ropes 18.

Two similarly-grooved pulleys 20 are mounted on the upper part of the derrick-frame 10, substantially in the same vertical plane with the grooved pulleys 12^a on the truck, and the hoisting-ropes 18 are extended from the latter over the pulleys 20, from which they trend downward to have their other ends attached to a power-driven drum 21, that is rotatably supported on the frame 10, so as to lie crosswise on the latter.

The drum 21 is shown as adapted for rotation by a belt 21^a, that may be extended to any suitable source of power and rotary motion; but it is not essential how the drum is actuated for its rotation, as a sprocket chain or shaft and miter-gearing of ordinary construction can be applied if preferred, or the drum may be directly connected to an electric motor and be revolved thereby.

At a suitable point on the frame 10, above the cross-beams which support the trackway and nearly opposite the upper extremity of the latter, an elongated pulley 22 is journaled in proper supports, which pulley is transversely placed on the main frame, as shown in Fig. 3. A draft-rope 23 is attached by one end to the outer end of the truck 12, and thence passes over a loose pulley 11^c, which is mounted on the outer end of the trackway near its transverse center. From the pulley 11^c the draft-rope is extended toward the pulley 22, and has its other end fastened to said pulley, whereon a portion of the draft-rope is wrapped in direction of the arrow 3 in Fig.

1. The rope 23 is arranged to occupy one end portion of the pulley 22 when it is wrapped on it, as shown in Fig. 3, and it will be so wrapped when the truck 12 is at the lower end of the trackway. On the opposite end of the pulley 22 a take-up rope 24 is secured by one end.

The take-up rope 24 is wrapped on the pulley 22, so that its free end will hang pendent on the rear side of the pulley and be adapted to wrap upon the pulley as the draft-rope 23 is unwrapped therefrom, and to said free end of the rope 24 a weight 25 is suspended, which may hang free, as indicated in Fig. 3, or be loosely inclosed in an upright box, as shown in Fig. 1.

At a proper point on the frame 10 a hopper 26 may be secured, which is designed to receive coal or other material that has been elevated by the shovel 19 and transfer it to a suitable dumping-place below the hopper, or it may be caused to fill a car 27 or wagon-body with the elevated material, if preferred.

A brake device of any suitable construction is provided to stop the rotation of the pulley 22 when the truck has arrived at the outer end of the boom and the shovel is being filled and raised, the device of friction-band type, which is represented clearly in Fig. 1, being shown as one means for controlling the rotary movement of said pulley. The friction-band 28 is drawn upon the periphery of the pulley 22 by means of a pivoted lever 29 and cord 30 that extends down from said lever to another horizontal lever 31 conveniently located for manipulation by the operator or attendant of the elevating apparatus. These devices constitute a locking mechanism whereby the truck is prevented from being moved up the trackway under the weight of the loaded shovel until said shovel has been lifted up sufficiently near the truck. This locking mechanism may be operated by means of the lever 31 on the supporting-frame at any desired time.

In operation it will be seen that the weight of the truck and the degree of inclination given to the trackway-beams 11 when adjusted for service will cause the truck 12 and elevating-shovel 19 to descend the trackway and occupy the relative positions represented in Fig. 1, it being necessary that the drum 21 be rotated so that the hoisting-ropes 18 may unwrap therefrom when the truck and shovel are to receive such an adjustment. A continuation of the reversed rotary movement of the drum 21 will allow the shovel 19 to descend and engage the material, such as coal, and when embedded in the mass of coal a rotary movement of the drum 21 in direction of arrow 4 will wrap the hoisting-ropes on said drum, causing an elevation of the shovel. After the filled shovel has been drawn near to the truck 12 the weight of the load, together with the draft-strain on the hoisting-ropes 18, will cause the truck and shovel to ascend the trackway and occupy its upper portion, the

curved ends of the trackway-beams so reducing the degree of inclination of the latter as to permit the truck and loaded shovel to remain in elevated adjustment, and to insure the truck against descent on the trackway until desired a keeper-pin 32 is introduced into transversely-aligned perforations in the sides of the truck-frame, as indicated in Fig. 1.

The use of the keeper-pin 32 may be deemed unnecessary, as there is such a weight-pressure on the truck, due to the suspension of the shovel from the hoisting-ropes, and while the truck and shovel are in elevated adjustment, as indicated by the bent dotted lines that in part represent the ropes 18, the loaded shovel will remain stationary until its contents are dumped into the hopper 26 by any provision made to effect the release of the closed sections of the shovel; and as this is not a part of the invention it is not considered necessary to more fully illustrate or describe the shovel.

The discharge of the contents of the shovel 19 may be produced either automatically when the truck 12 is at or near the top of the trackway or may be manually effected by the operator; and when the shovel is emptied a reverse movement of the drum 21 should be produced, which will allow the truck to descend the trackway for a repetition of the hoisting operation.

The weight 25 will have unwrapped a considerable portion of the rope 24 when the truck 12 is at the lower or outer end of the trackway, and the draft-rope is then correspondingly wrapped on the pulley 22. As soon as draft-strain is applied to the hoisting-ropes 18 the draft thus applied to the truck 12 will move it up the trackway and unwrap the rope 23 from the pulley 22, at the same time wrapping the rope 24 thereon.

It will be seen that the traverse of the truck on the trackway will be rendered steady and under complete control by provision of the ropes 23 24, weight 25, and the friction-brake device, so that the descent of the truck and shovel can be regulated at the will of the operator.

When it is desired to remove the truck from the position shown in Fig. 1, so as to permit the free movement of vessels along the shore of the water-course, or cars over a railroad track that the apparatus may be located at the side of, this can be readily effected by relaxing the winch-drum ropes 15, which will permit the trackway to assume an upright position within the frame 10 and away from the water-course or railroad-track, so that vessels or cars can be moved without any obstruction from the improved elevating apparatus when it is not in service.

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

1. The combination of a supporting frame having a sheave at its upper part, a trackway secured to and extending beyond the said frame below the said sheave and having a

sheave at its outer end, a truck arranged to move on said trackway and provided with a sheave, a shovel, a cable secured thereto and passing over the sheave on the truck and over the sheave on the upper part of the supporting frame, a cable secured to the truck and passing over the sheave at the outer end of the trackway and back to the supporting frame, a sheave on the supporting frame over which said cable passes, a weight secured to the said cable, and means for drawing in the first mentioned cable, substantially as shown and described.

2. In a coal hoisting apparatus, a supporting frame, a normally stationary jib beam pivoted thereon at a point between the ends of the jib, the outer end of the beam being extended beyond the frame, a truck movable on the beam, a shovel and its operating mechanism combined with the truck, a guy rope holding the outer end of the beam from upward movement, a second guy rope connected to the beam, a pulley raised above the beam and on the frame and over which pulley the second rope passes, and hoisting mechanism connected to the second rope and mounted on the frame, substantially as described.

3. In a coal hoisting apparatus, a supporting frame, a jib beam having a trackway and mounted thereon a truck movable on the beam, a pulley mounted on the truck, a pulley on the frame and elevated above the beam, a cable passing over the pulleys on the frame and truck, a sectional shovel affixed to the lower end of the cable, hoisting mechanism for the cable, a pulley at the outer end of the beam, a second cable connected to the truck and passing over the pulley at the outer end of the beam, a drum on the frame to which the second cable is connected, a weight connected to the drum and actuating the same, brake mechanism for the drum, and a rope for operating the sections of the shovel substantially as described.

4. The combination with a frame, of a trackway projecting outwardly therefrom, a truck movable on the track-way, a pulley on the truck, a second pulley elevated above the

frame and located out of vertical alignment with the outer portion of the track-way, a cable passing over the two pulleys, a sectional shovel connected to the lower end of the cable, means for drawing on the said cable, a second cable connected to the truck, and a weight connected to the second cable, and giving the truck an outward tendency, and a rope for operating the sections of the shovel, substantially as described.

5. In a coal hoisting apparatus, a frame, two transversely aligned beams mounted on said frame and having adjacent inner ends, a jib beam formed of the two duplicate channel irons arranged channel to channel and respectively pivoted to the adjacent inner ends of the said beams, the outer ends of the irons being rigidly connected to each other, a truck having rollers movable in the channels of the beam sections, and shovel mechanism operating with the beam and its truck, substantially as described.

6. In an apparatus for hoisting coal, a frame, a jib beam pivotally mounted thereon, a truck movable on the jib beam, a pulley mounted on the truck, a pulley 20 mounted at the upper extremity of the frame and out of alignment with the outer portion of the jib beam, a sectional shovel, a hoisting rope connected with the shovel and passing over the pulley on the truck and over the pulley 20, means for drawing on the hoisting cable, a second cable connected to the truck, a drum on the frame over which the second cable is wound, a weight connected to the drum whereby it is made to actuate the second cable, a hopper located below the inner end of the jib beam and into which the shovel may dump its contents, a strap brake for the drum which operates the second cable aforesaid, and a lever fulcrumed on the hopper and connected to the strap brake whereby the same may be operated, and a rope for operating the second shovel, substantially as described.

GEORGE HAISS.

Witnesses:

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JNO. M. RITTER.