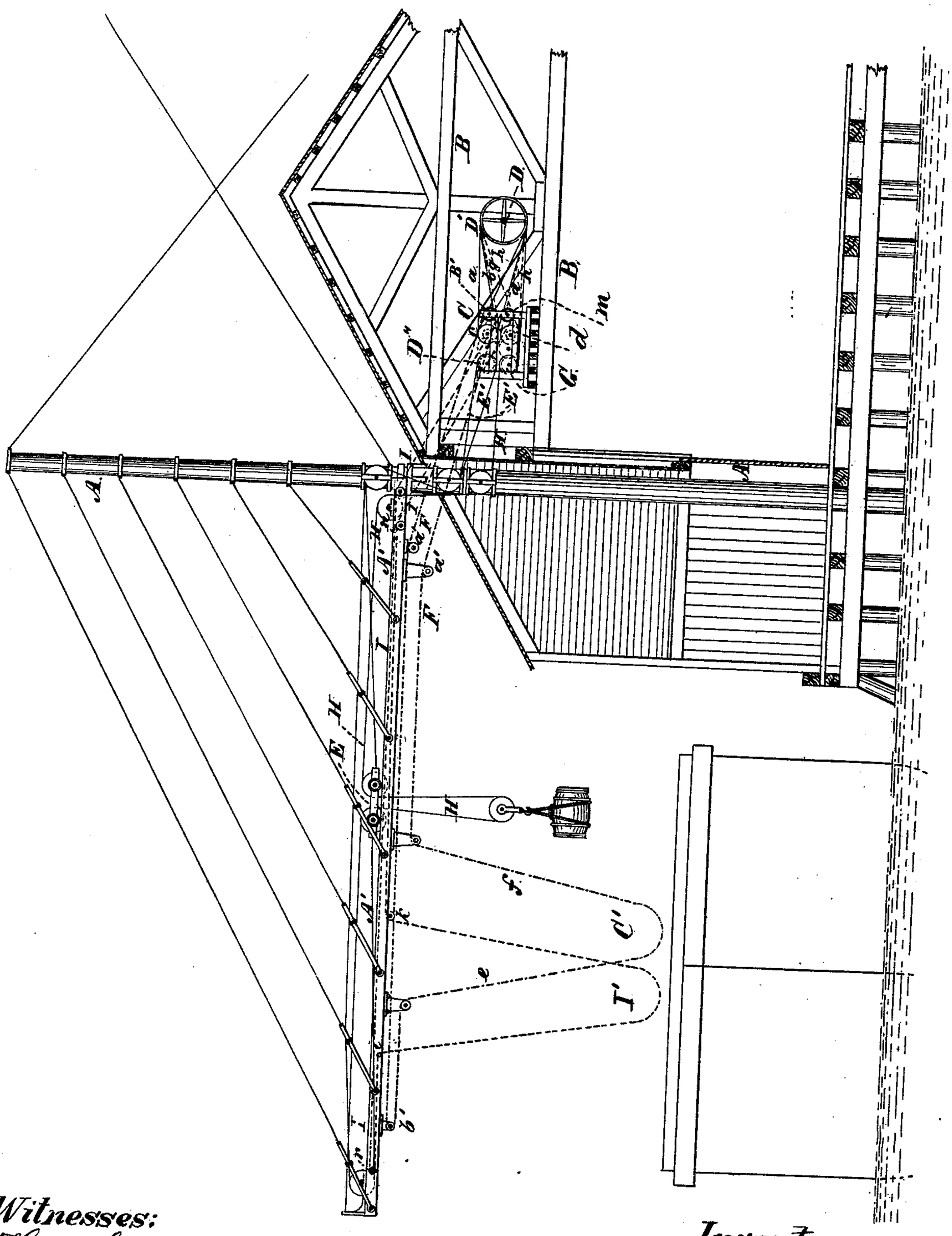
N. B. CUSHING.

Hoisting Apparatus.

No. 219,803. Patented Sept. 23, 1879.



Witnesses:

Henry Eichling.

J. I. Wells Jr.

Inventor:

Nichols B Cushing

per

James A Whitney

atty.

UNITED STATES PATENT OFFICE.

NICHOLS B. CUSHING, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN HOISTING APPARATUS.

Specification forming part of Letters Patent No. **219,803,** dated September 23, 1879; application filed January 11, 1879.

To all whom it may concern:

Be it known that I, NICHOLS B. CUSHING, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Hoisting Apparatus for Loading and Unloading Vessels, &c., of which the following is a specification.

In the operation of hoisting freight on shipboard from the pier as ordinarily practiced the labor and attention of four men are necessary with each hoisting apparatus—one on the deck of the vessel, one at the engine which operates the hoist, one at the brake of the latter, and one to convey verbal signals from the man on deck to the others. Notwithstanding the number of men thus required the absolute labor involved is slight, and in the aggregate not beyond the strength of one individual.

This invention comprises certain new combinations of actuating lines or cords with the derrick and other essential portions of a hoisting-machine, whereby one man is enabled to operate the entire apparatus without assistance, and without the liability of accidents, which, in the ordinary mode of operation, frequently arise from misunderstanding between the signal-man and the other attendants and operators.

It may furthermore be stated that there may be one or more hoisting-machines driven from a line or shafting, all driven by one engine, the shafting to be either lengthwise or crosswise of the pier; also, that the principal portions of the apparatus are to be placed overhead, so as to leave the pier all clear for handling cargo; also, that the upper drum, D″, has two ropes connected with it and with both ends of the traveling carriages E, to form as it were one endless rope, which moves the carriage out and in on the boom A′. As one part of the rope is wound upon the drum the other unwinds the part which runs over the two sheaves shown in the drawing, moves the carriage E in one direction, and the other part runs up over two corresponding sheaves on the other side of the mast A, and moves the carriage in the opposite direction. It will of course be observed that the drum G is used for hoisting only, and has but one rope.

The drawing represents, in elevation, an apparatus embracing my said invention.

A is the derrick of any usual or suitable construction, and having its boom A′ extended beyond the edge of the pier in order to be brought over the deck of the vessel to to be loaded.

B represents the beams of a suitable structure erected to support the hoisting-machine C, which is a compound or double hoisting-machine, designed for this purpose, and is driven from a driving-shaft, D, by means of a drum, D′, thereon, and the belts hereinafter described.

The drum D′ is connected with the machine C by two belts, one a straight and the other a cross belt, as shown at *a b*. These belts run to a system of pulleys at *c*, comprising one tight and two loose pulleys. Connected with these is a suitable belt-shifter or device, B′, which being well known needs no specific description here. By working this belt-shifter one or the other of the belts *a b* may, as occasion requires, be run upon the tight pulley at *c*, and according as one or the other of said belts runs upon the said tight pulley at *c*, the winding-drum D′, actuated from said fast pulley, will be turned in one direction or the other to run the traveling carriage E, operated from the drum D′ by the rope E′ in the usual manner, in or out along the boom to bring the freight hoisted by the apparatus to any desired place below said boom.

A cord or line, F, extends from one arm, side, or part of the belt-shifter C′ of the belts *a b*, that run the pulleys at *c* to and over antifriction pulleys *a′* on the derrick, thence along the boom to the end thereof, where it turns around a pulley, *b′*, and has its opposite end carried back and secured to the other or opposite side or arm of the aforesaid belt-shifter, said cord at one place depending in a loop, C′, over the vessel or locality where the operator is intended to stand. By pulling the aforesaid cord or line F at one side, *e*, the aforesaid belt-shifter will be actuated to bring, say, the straight belt *a* upon the tight pulley at *c*, and thus cause the traveling-carriage E to move in one direction upon the boom, and by pulling upon said cord or line at the other

side, *f*, of the loop C′, said belt-shifter will be actuated to run the other belt, *b*, upon said tight pulley, thereby reversing the movement of the drum and causing the traveling pulley to move the other way. Of course a proper manipulation of the line F will bring the belts *a b* upon the two loose pulleys, thereby causing the tight pulley to stand still, and thus permit the traveling carriage to remain stationary upon the boom when so desired. In this case a brake, in a manner well known in the trade, is applied to the tight pulley to prevent its reverse movement from the strain of the lifted load.

G is the winding-drum, from which runs the hoisting-rope H, actuated therefrom in the ordinary manner. This winding-drum is connected by gearing with a shaft on which are three pulleys, two loose and one tight, these being situate at *d*, and in the manner usual with certain kinds of well-known hoists. From these pulleys run two belts, *g h*, to the drum D′, and a belt-shipper, at *m*, is so arranged as to throw one or the other of said belts upon the tight pulley at *d* to turn the winding-drum G in one direction or the other, according as it is desired to lift or lower the load, and also, on occasion, to run both of said belts upon the loose pulleys clear of the tight pulley, which latter is then, in the ordinary manner, held by a brake of any suitable character to hold stationary the suspended load.

Attached to the belt-shipper *m* is a line or cord, I, (shown in dotted lines in Fig. 1,) which extends therefrom over pulleys *n n* on the derrick, and thence back over pulleys *i k* again to the said belt-shipper. This line or cord I has a depending loop, I′, so that by pulling upon one side of the loop the belt-shipper *m* will run one of the belts *g h* upon the tight pulley at *d* to raise the load, and, by pulling upon the other side of said loop, the said shipper will run the other of said belts upon said tight pulley to lower the load, the cord or line I thus enabling the shipper *m* to control or manipulate the apparatus, so far as the raising, lowering, &c., are concerned, the loop I′ being of course at the same place as the loop C′, so that one person, by manipulating the two cords or lines, I F, is enabled to wholly manage the entire operation of the apparatus.

What I claim as my invention is—

1. The combination of the cord or line F or its equivalent, the shifting device B′, and the winding-drum D″ with the boom A′ of the derrick and the traveling carriage E, substantially as and for the purpose set forth.

2. The combination of the cord or line I or its equivalent, the shifting device *m*, and the winding-drum G with the boom A′ of the derrick, substantially as and for the purpose set forth.

3. The combination of the cord or line F with the boom A′ of the derrick, and the traveling carriage E, and a winding-drum, D″, substantially as and for the purpose herein set forth.

4. The combination of the cord or line I with the boom A′ of the derrick, and the winding-drum D of a hoisting-machine, substantially as and for the purpose set forth.

5. The two double cords or lines I F, in combination with the shifting device and boom of the derrick, the winding-drum D″, the traveling carriage E, and the drum G, the whole arranged for joint use and operation, substantially as and for the purpose set forth.

6. An organized apparatus for hoisting and hauling, comprising the two drums D″ G, the driving-drum D′, two systems of belts and gearing arranged to transmit motion from the drum D′ to the drums D″ and G, and suitable shifting or shipping devices for putting on and off said motion, all substantially as and for the purpose set forth.

7. An organized apparatus, comprising the drum D′, the combined hoisting-machine having the drums D″ G, connected with the drum D′, shipping-belts, and tight and loose pulleys, the two double cords or lines I F, and the boom A′ of the derrick, the whole combined and arranged for joint use and operation, substantially as and for the purpose set forth.

NICHOLS B. CUSHING.

Witnesses:

H. WELLS, JR.,

W. R. WHITNEY.