

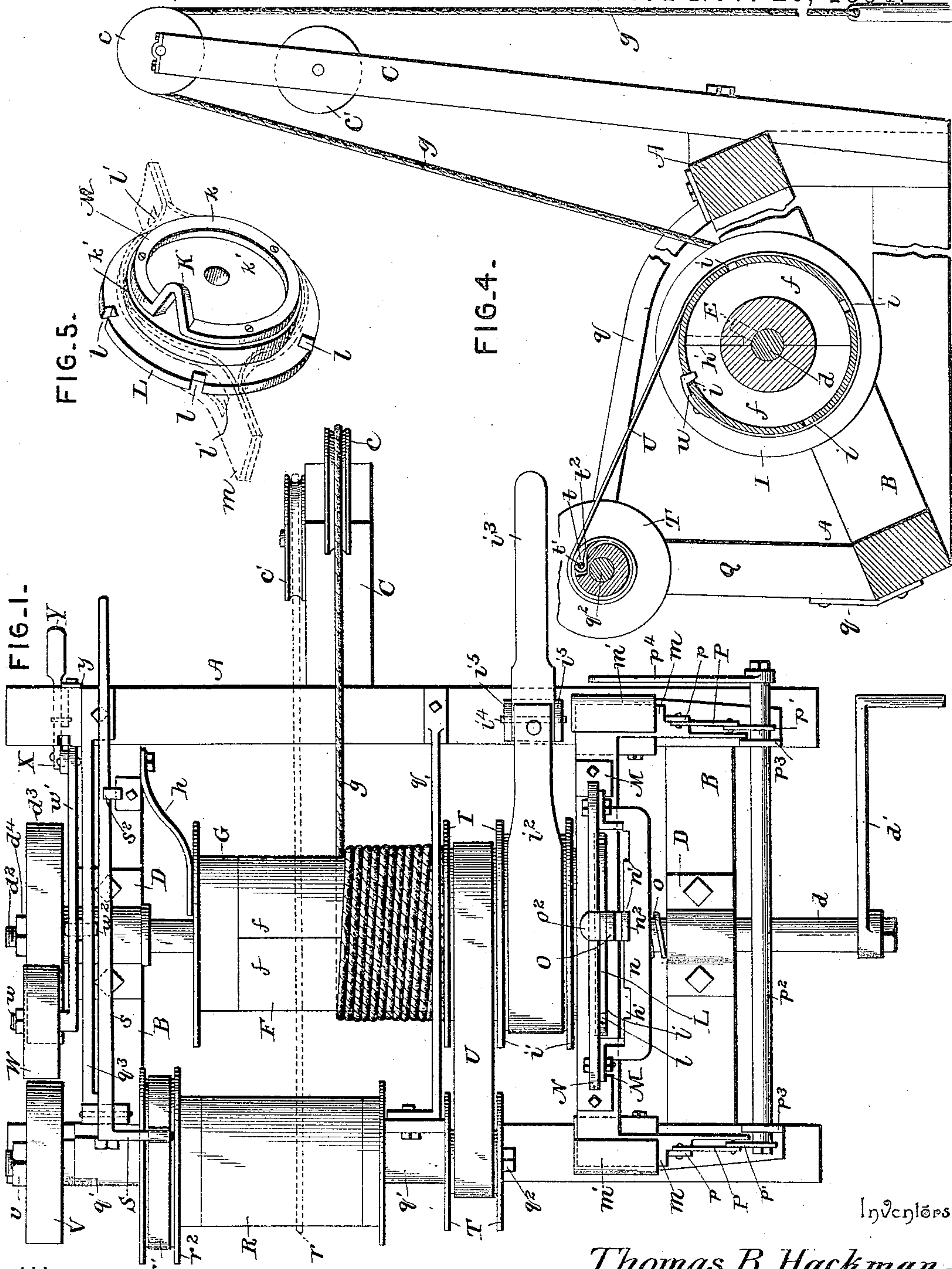
(No Model.)

2 Sheets—Sheet 1.

T. B. HACKMAN & L. & A. RUPPEL.
HOISTING AND DRILLING MACHINE.

No. 529,378.

Patented Nov. 20, 1894.



Witnesses

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By their Attorneys.

Thomas B. Hackman

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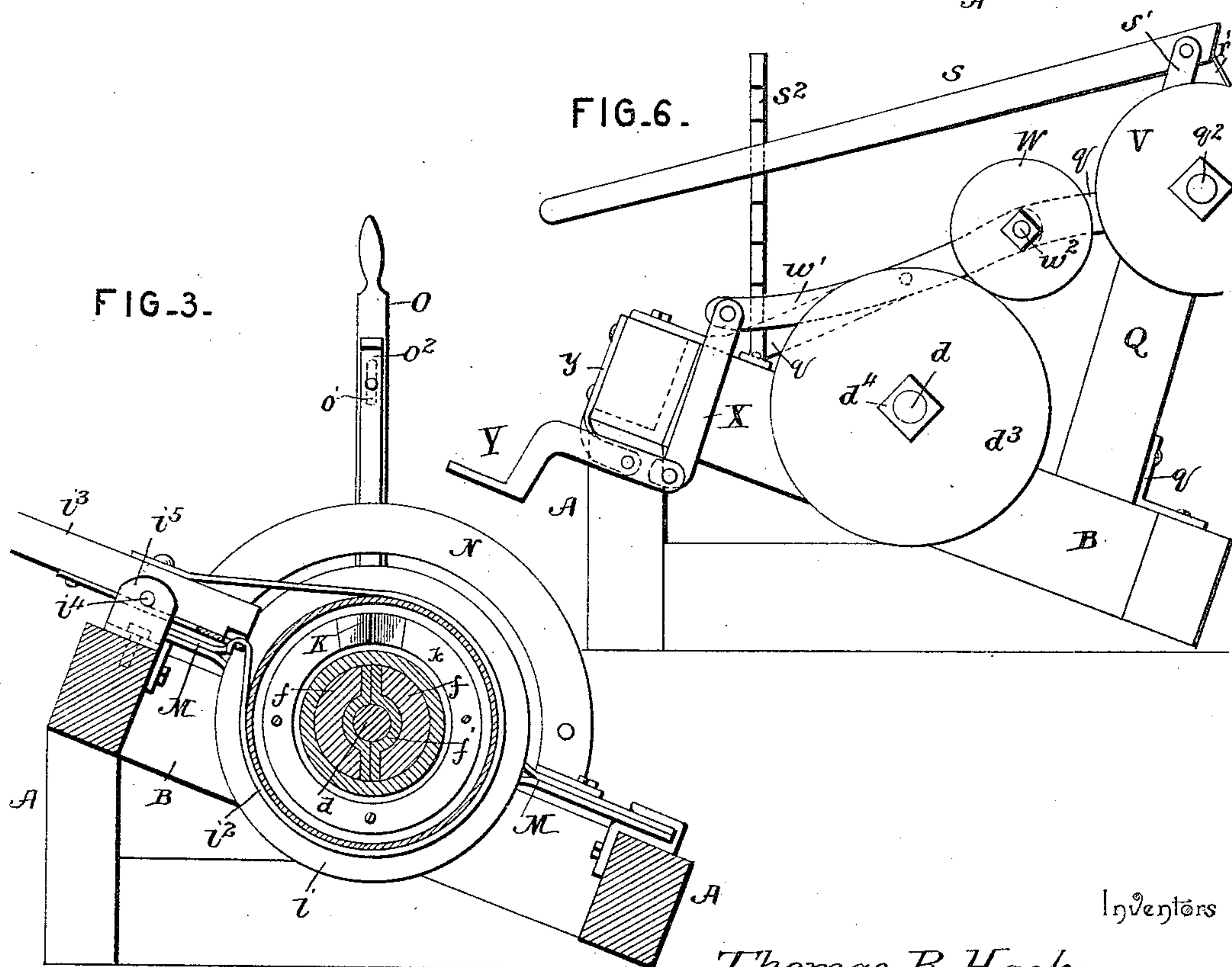
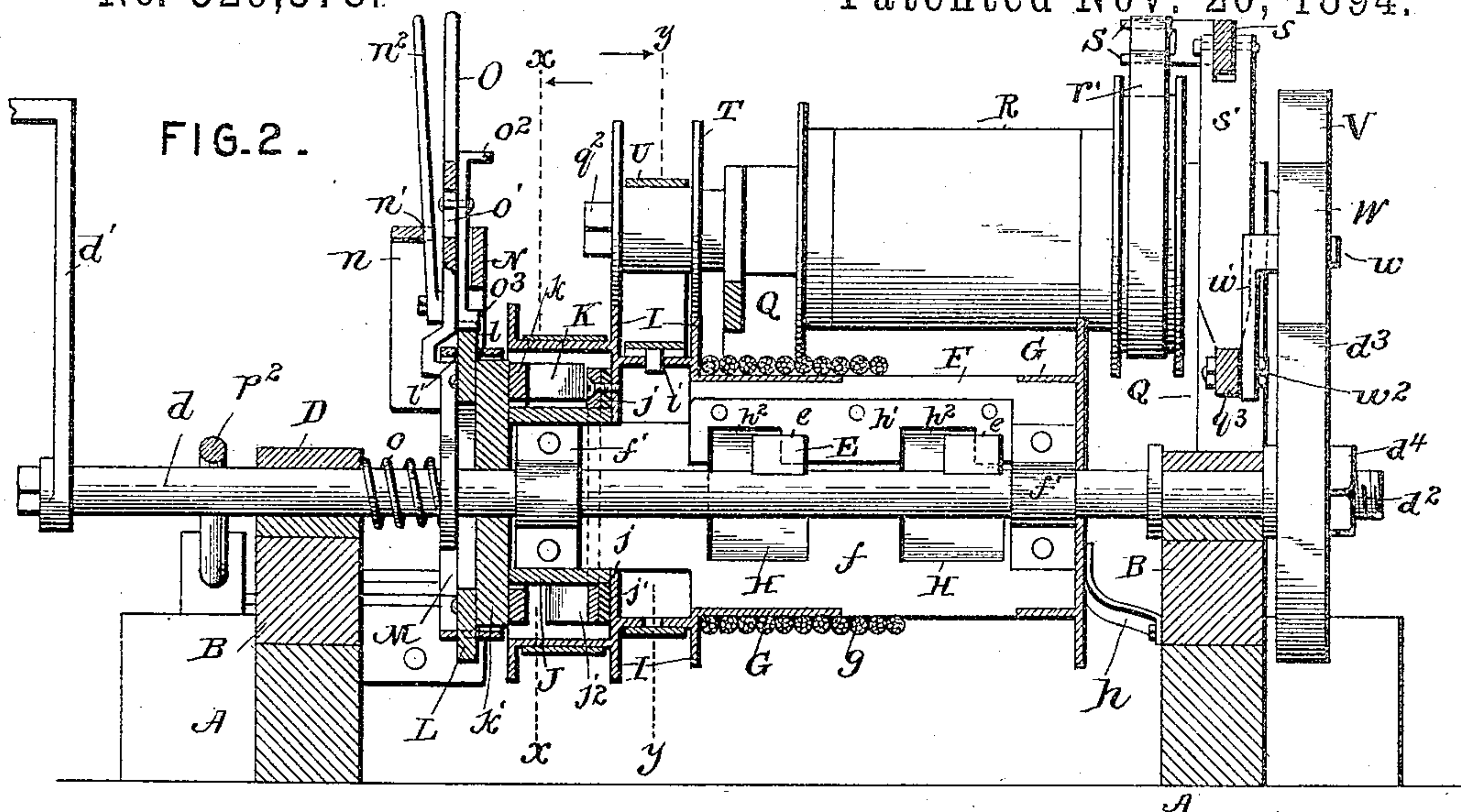
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Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS B. HACKMAN, LEONARD RUPPEL, AND ALBERT RUPPEL, OF
AURORA, MISSOURI.

HOISTING AND DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 529,378, dated November 20, 1894.

Application filed April 2, 1894. Serial No. 506,068. (No model.)

To all whom it may concern:

Be it known that we, THOMAS B. HACKMAN, LEONARD RUPPEL, and ALBERT RUPPEL, citizens of the United States, residing at Aurora, in the county of Lawrence and State of Missouri, have invented a new and useful Hoisting and Drilling Machine, of which the following is a specification.

This invention relates to hoisting and drilling machines and it has for its object to effect certain improvements in machines of this character, which while especially adapted for drilling purposes, can also be equally as well adapted for ordinary hoisting purposes.

To this end the main and primary object of the present invention is to provide an improved machine of this character the parts of which are assembled to afford every adjustment necessary to a secure and efficient operation of the gear devices when the machine is either used for drilling or ordinary hoisting.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings:—Figure 1 is a top plan view of a hoisting and drilling machine constructed in accordance with this invention. Fig. 2 is a central vertical longitudinal sectional view thereof. Fig. 3 is a vertical transverse sectional view on the line $x-x$ of Fig. 2. Fig. 4 is a similar view on the line $y-y$ of Fig. 2. Fig. 5 is a detail in perspective of the turning head-block showing in dotted lines a portion of the sliding frame therefor. Fig. 6 is an end view of the machine.

Referring to the accompanying drawings, A represents a substantially rectangular machine frame arranged on the inclined supports B, as illustrated in the drawings, and at one side of the frame A, the same has connected thereto the derrick arm or mast, C, arising above the frame and carrying at its extreme upper end the rope wheel or pulley c , over which is designed to pass the hoisting or drilling rope of the machine, and attached to one side of the derrick arm below the wheel or

pulley c , is a second wheel or pulley c' , the function of which will presently appear.

The frame A, is provided at opposite ends thereof with the bearing boxes D, in which are journaled the opposite ends of the hoisting shaft d . The hoisting shaft d , is extended beyond both ends of the frame, and is adapted to have connected to one end thereof an operating crank d' , whereby the same may be manipulated by hand, but which may be substituted for by a band wheel or pulley for transmitting motion to the shaft d , from a steam engine or other motor, and to the opposite end of the shaft, which is threaded as at d^2 , is attached a gear wheel d^3 , held thereon by the nut d^4 , engaging said threaded end of the shaft at one side of said wheel.

The hoisting shaft d , is provided at a point intermediate of its ends with the separated gear lugs E, and on said shaft is loosely mounted the hoisting drum F. The hoisting drum F, preferably comprises duplicate superposed drum sections f , and at opposite ends of the drum the same is provided with the interior bearing boxes f' , which loosely embrace the shaft d , and the duplicate superposed drum sections are held together by the flanged end rings G, embracing the opposite ends of the drum and serving to confine thereon the hoisting or drill rope g , which passes over the wheel or pulley c , at the top of the derrick arm and is connected with a drill or other object to be hoisted. The hoisting drum F, is further provided with the interior circular recesses H, which are spaced from each other the same distance as the gear lugs E, on the shaft d , and these recesses are designed to accommodate the said gear lugs when the drum is loosely revolving on the shaft in one direction, but the recesses of the drum are normally held out of alignment with the lugs E, by means of the leaf gear spring h , attached to one end of the frame and pressing against one end of the drum, and thereby normally holding the drum in gear with the shaft, inasmuch as in this position, the lugs E, project at one side of the recesses H, and bear against the metallic wear plate h' , arranged within a recess inside of the drum adapted for its reception and provided in one edge at spaced

points with the notches h^2 , which agree with the interior circular recesses H, to admit the passage of the lugs E, when the recesses of the drum are in alignment with such lugs.

5 As described, the drum F, is normally held in a position with the lugs E, in longitudinal recesses e, standing off from one side of the recesses H, so that as the said shaft is turned in one direction the drum is necessarily carried therewith and will wind up the rope g, thereon, so as to elevate a drill or other object. One of the flanged end rings G, of the drum F, is extended into the flanged belt disk or drum I, provided in its periphery with a series of openings or notches i, and at one side of the belt disk or drum I, is located the flanged brake wheel i' , which is encircled by the band brake i^2 , the ends of which are detachably connected to one end of the brake lever i^3 . The brake lever i^3 is pivotally mounted on the pivot pin i^4 , in the U-shaped pivot bracket i^5 , which is swiveled on the frame at one side thereof to permit the said brake lever not only a free movement for checking the rotation of the drum F, but also for moving the drum longitudinally, in ordinary hoisting, against the tension of the spring h, to throw the same out of gear with the lugs E, and allow it to revolve, as will be easily understood.

30 The flanged brake wheel i' , incloses a circular recess at one end of the drum F, and fitted within this recess on a neck projection J, of said drum, is the collar j, to which is fitted the cam ring j' , provided with an outwardly projecting beveled cam lug j^2 , which is adapted to ride over a reversely disposed cam lug K, projected inwardly from the cam ring k, attached to the inner face of the circular head block k' . The circular head block k' , is mounted loosely on the shaft d, for circular and longitudinal adjustment, and has attached to the outer side thereof the adjustment flange or ring L. The adjustment flange or ring L, projects beyond the periphery of the circular head block and is provided in its outer edge with a series of regularly spaced notches l, and is adapted to turn in the longitudinally disposed guide slots l', formed in the superposed reversely disposed bowed frame plates M, connected at their opposite ends and provided at such ends with the right angularly disposed slide plates m, mounted to slide in the flanged guide plates m', attached to the front and rear top sides of the frame A.

55 The superposed bowed frame plates M, form a head block frame for the longitudinal adjustment of the circular head block on the shaft d, to and away from one end of the hoisting drum F, and secured to the uppermost or top frame plate M, is the curved bracket N, to one side of which is secured the offstanding curved catch bar n, provided in its inner edge with the notches n' , adapted to receive the spring latch lever n^2 , secured fast at its lower end to one side of the adjusting lever O, and normally pressing away

from the same so as to engage in the said notches. The adjusting lever O, is loosely fitted at its lower end onto the shaft d, and this lower or inner end of said lever is normally held at one side of the circular head block by the spring o, arranged on the shaft d, at one side of the same. The lever O, has a swinging movement between the bracket N, and a catch bar n, and is provided with a slot o' , which receives the headed pin of the sliding catch plate o^2 , working at one side of said lever and provided with a lower pointed catch end o^3 , which is adapted to engage the notches l, in the periphery of the adjustment flange or ring L. By adjusting the lever O, with the sliding catch plate engaged with the circular head block, such head block may be turned to shift the position of the beveled cam lug K, and thereby increase or diminish the distance the lug j^2 , travels before it rides over the said lug K, to throw the drum F, out of gear with the lugs E, against the tension of the spring h, and by this means the "drop" of the drill may be regulated to the number of inches desired.

In adapting the machine for ordinary hoisting purposes, when simply the shaft d, and the manipulating brake lever i^3 , are employed, it is necessary to move the head block away from the recessed end of the drum, and to provide for this adjustment, links P, are pivotally connected at one end to the lugs p, arising from one of the slide plates m, at the opposite ends of the head block frame, and at their other ends are pivotally connected to the outer extremities of the rock arms p' , attached to the opposite extremities of the adjusting rock shaft p^2 , journaled in the perforated bearing lugs p^3 , flanged up from the outer extremity of the guide plates m'. An operating handle or lever p^4 , is attached to one end of the shaft p^2 , to provide means for operating the shaft, and by manipulating this lever it will be readily seen that the head block frame, carrying the circular head block, may be readily moved to and away from the hoisting drum.

Arising from one side of the frame A, at one side of the drum F, are the bearing uprights Q, suitably braced to the opposite side of the frame by the brace irons q, and at the upper ends of the uprights Q, the same are provided with the bearing boxes q' , in which is journaled the reel shaft q^2 , on which is fixedly mounted the sand reel or drum R, on which winds and unwinds the ordinary cleaning rope r, that, when put in use, is passed over the wheel or pulley c' , and is connected to the ordinary sand pump or cleaner to clean out the cuttings of the drill in the ordinary manner, but when not employed for this purpose the sand reel or drum R, is held stationary by means of the band brake r' , encircling the flanged brake disk r^2 , secured to one end of the reel. The extremities of the band brake r' are detachably engaged with the studs S, projected from one end of the

brake lever *s*. The brake lever *s*, is pivoted at the stud end thereof in the upper bifurcated end of the bracket *s'*, and is adapted to engage at one side the notched catch bar *s*² secured to one end of the frame *A*, and serving to hold the brake lever *s*, stationary in its adjusted position.

At one end of the reel shaft *q*², is mounted a grooved belt wheel *T*, provided with a recess *t*, in the base thereof and a transverse catch pin *t'*, arranged over the recess and adapted to be detachably engaged by the hook end of the curved hook plate *t*², secured to one end of the flexible stop belt *U*, which is wound on said grooved belt wheel and has attached to the other end thereof a similar plate *u*, the hook end of which is reduced to engage any one of the openings or notches *i*, in the periphery of the flanged belt disk or drum *I*, carried by the drum *F*. With the sand reel held stationary as described, and the proper length of the flexible stop belt wound on the belt disk or drum of the hoisting drum, this belt will slack up as the drill is elevated, when drilling, and will stop the backward rotation of the hoisting drum after the drill strikes the bottom of the hole. By loosening the brake lever *s*, the stop belt may be paid out to follow up the drill as it is sunk into the hole or well.

The end of the reel shaft *q*³, opposite to the end on which the belt wheel *T*, is mounted is threaded to removably receive the friction wheel or pulley *V*, held in position by the nut *v*, and this friction wheel or pulley *V*, and the friction wheel or pulley *d*³, at one end of the shaft *d*, are adapted to be simultaneously engaged by the intermediate idler friction pulley *W*. The pulley *W*, is journaled on the spindle end *w*, of the adjustable bearing arm *w'*, pivoted at a point intermediate of its ends at *w*², to one of the brace irons *q*, and having pivotally connected to the free end thereof the adjusting link *X*, the other end of which is pivotally connected to the inner end of the tread or foot lever *Y*, pivotally mounted on the bracket *y*, secured to one end of the frame *A*.

For drilling purposes the reel shaft, to which is connected one end of the flexible stop belt, is held stationary by the band brake *S*, and the head block is adjusted up to one end of the hoisting drum, and with this adjustment of parts the machine is adapted for operating a drill. The rotation of the shaft *d*, in one direction, with the lugs *E*, engaging at one side of the recesses *H*, the drum *F*, is rotated until the cam lug *j*², at one end thereof is brought in contact with the reversely disposed lug *K*, of the head-block. The head block cam lug, being held stationary, causes the lug of the drum to ride thereover and this moves the drum *F*, longitudinally to bring the recesses *H*, into alignment with the lugs *E*, and the drum will then automatically revolve back, with the lugs *E*, in the recesses *H*, and allow the drilling tool to drop to the bottom

of the well, the continued backward rotation of the drum being stopped by the flexible stop belt before referred to.

For ordinary hoisting purposes the flexible stop belt is disengaged from the hoisting drum, and the head block moved away from one end of the same, and by turning the shaft *d*, in one direction to turn the drum *F*, and by manipulating the brake lever *i*³, both as a brake lever and a gear lever, ordinary hoisting may be easily accomplished.

While drilling it is necessary at times to employ the sand reel for the ordinary purpose, and by throwing the drum *F*, out of gear with the shaft *d*, with the lever *i*³, and by releasing the band brake *S*, the said sand wheel may be directly geared with the shaft *d*, through the medium of the idler friction pulley *W*. This pulley is adjusted against the wheels *V* and *d*³, by pressing the foot on the lever *Y*, after which the sand reel may be revolved back and forth to operate the cleaning devices.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a machine of the class described, the combination of a hoisting shaft having spaced gear lugs, a hoisting drum mounted loosely for longitudinal adjustment on said shaft and provided with spaced interior circular recesses, said drum being sectional and consisting of duplicate superposed sections, a suitably arranged spring to normally hold the drum in a position with the recesses thereof out of alignment with the lugs on said shaft, and means for automatically moving the longitudinally movable drum out of gear with said gear lugs, substantially as set forth.

2. In a machine of the class described, the frame, a hoisting shaft journaled on said frame and having separated gear lugs, a hoisting drum loosely journaled on said shaft and provided with a longitudinal bore to accommodate the shaft and gear lugs, interior circular recesses separated from each other, and a longitudinally disposed metallic wear plate having notches agreeing with said circular recesses, a suitably arranged spring at one end of the frame to normally hold the drum in a position with the circular recesses out of alignment with the gear lugs on said shaft, and means for automatically moving the drum out of gear with said gear lugs, substantially as set forth.

3. In a machine of the class described, the combination with the frame having a derrick arm or mast; of the rotating hoisting shaft journaled on said frame, a longitudinally movable hoisting drum loosely mounted on said shaft, interior gear devices within the drum to connect the same with the shaft, a flanged

brake wheel attached to one end of said drum, a spring for normally holding the drum in gear with the shaft, a band brake embracing said brake wheel, and the brake lever connected with said band brake and mounted pivotally in a swiveled support, whereby the said lever can be manipulated to move the drum against the tension of the spring to disengage the drum from its gear devices substantially as set forth.

4. In a machine of the class described, the combination with the hoisting shaft; of a hoisting drum loosely mounted on said shaft and having a brake wheel and a belt drum, a band brake encircling said brake wheel, a flexible stop belt adjustably supported at one end and detachably connected to said belt drum, interior gear devices within the hoisting drum to connect the same with the shaft, and means for automatically disengaging the drum from its gear devices, substantially as set forth.

5. In a machine of the class described, the combination with a frame having a derrick arm or mast; of the rotating hoisting shaft journaled on said frame, a hoisting drum loosely mounted on said shaft and provided with a flanged belt disk or drum having a series of peripheral openings, interior gear devices within the drum, the reel shaft carrying a belt wheel provided with a recess in its base and a catch pin over said recess, means for holding the reel shaft stationary, a flexible stop belt having hook plates at both ends adapted to respectively engage with the catch pin of the reel shaft belt wheel and the peripheral openings of the belt disk or drum, and means for automatically disengaging the drum from its gear devices, substantially as set forth.

6. In a machine of the class described, the combination with the frame and the hoisting shaft journaled thereon; of a hoisting drum loosely mounted on the shaft and provided with a flanged belt disk or drum, interior gear devices arranged within the hoisting drum, the reel shaft carrying a belt wheel, means for holding the reel shaft stationary, a flexible stop belt detachably connected at one end to the belt wheel of the reel shaft, and detachably and adjustably connected at its other end to the belt disk or drum of the hoisting drum, and means for automatically disengaging the drum from its gear devices, substantially as set forth.

7. In a machine of the class described, the combination with the hoisting shaft, the hoisting drum and the gear devices between the two; of a cam ring fitted to one end of the hoisting drum and provided with an outwardly projecting beveled cam lug, a sliding head-block frame arranged for support beyond one end of the drum a head block loosely

mounted on the hoisting shaft at one end of the drum within said sliding frame, said block being provided at one side with a cam ring having a beveled cam lug adapted to be engaged by that carried by the hoisting drum, and with an adjustment flange or ring, means for circularly adjusting the head block frame, a catch for said flange or ring, and separate means for moving the head block to and away from the hoisting drum, substantially as set forth.

8. In a machine of the class described, the combination with the hoisting shaft, the hoisting drum having a projected cam lug at one end, and gear devices between the shaft and drum, of a sliding head block frame arranged beyond one end of the drum and consisting of superposed reversely disposed bowed frame plates having longitudinally disposed guide slots, a head block loosely mounted on the hoisting shaft and provided at one side with a beveled cam lug, and with an adjustment flange or ring working in the guide slots of the frame plates and having a peripheral series of notches, a curved bracket attached to the upper one of said frame plates and having an off-standing curved notched catch bar, an adjusting lever pivoted on the hoisting shaft at one end and working between the catch bar and said bracket, a spring latch lever attached to one side of the adjusting lever to normally engage the notches of the catch bar, a sliding catch plate attached to the opposite side of the adjusting lever and adapted to engage the notches of said adjustment flange or ring, and means for adjusting the head block frame, substantially as set forth.

9. In a machine of the class described, the combination with the hoisting shaft having a projected cam lug at one end, and normally engaged gear devices between the shaft and drum; of oppositely arranged flanged guide plates, a sliding head block frame having the opposite ends thereof sliding in said guide plates, a circularly adjustable head block mounted in said frame and having at one side a cam lug, an adjusting rock shaft journaled at one end of said guide plate and provided at its opposite ends with rock arms, and links pivotally connected to the extremities of said rock arm and to the opposite ends of the head block frame, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

THOMAS B. HACKMAN.
LEONARD RUPPEL.
ALBERT RUPPEL.

Witnesses:

M. D. INGRAM,
EDUARD DALY.