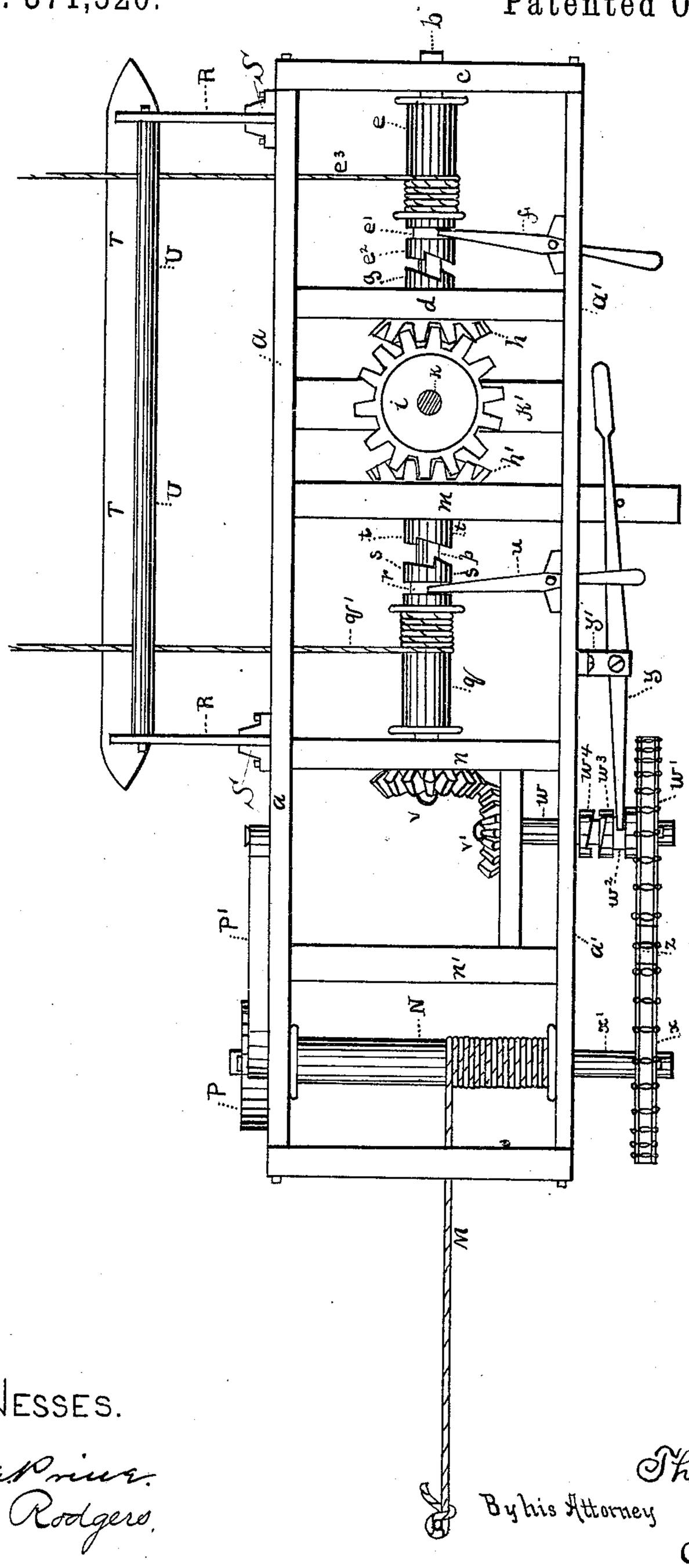
(No Model.) 2 Sheets—Sheet 1.

T. E. ROWAN.

MEANS FOR OPERATING DITCHING MACHINES.

No. 371,520. Patented Oct. 11, 1887.

FIG. 1.



WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

T. E. ROWAN.

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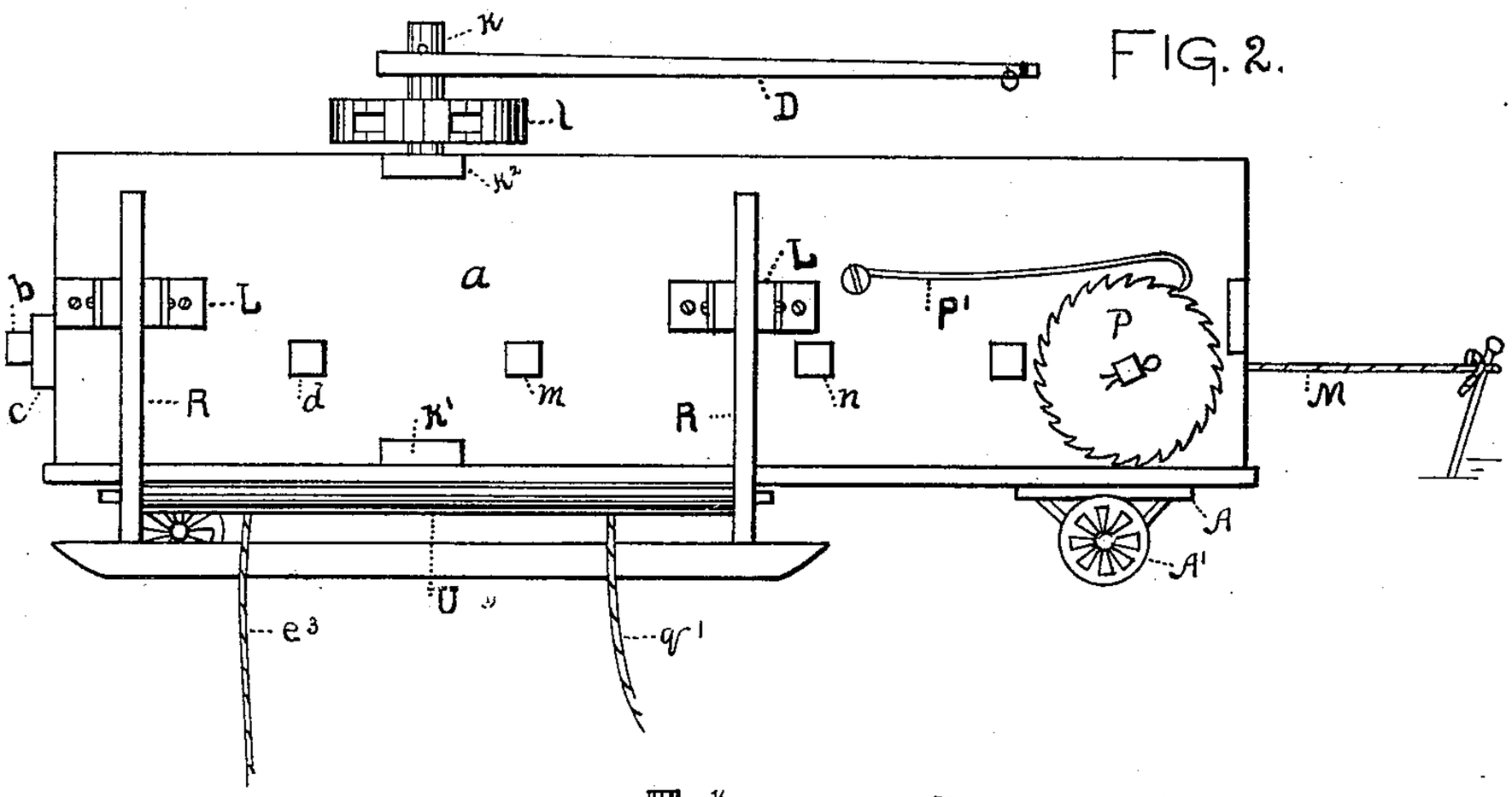
FIG. 2.



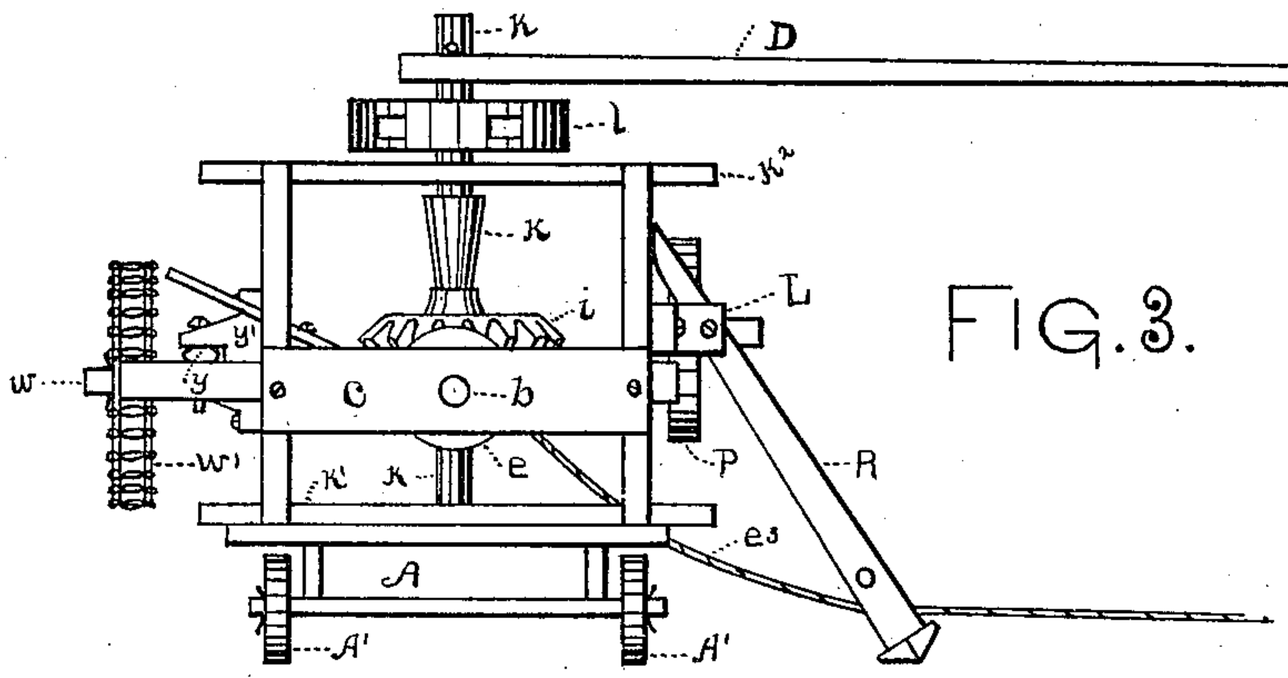
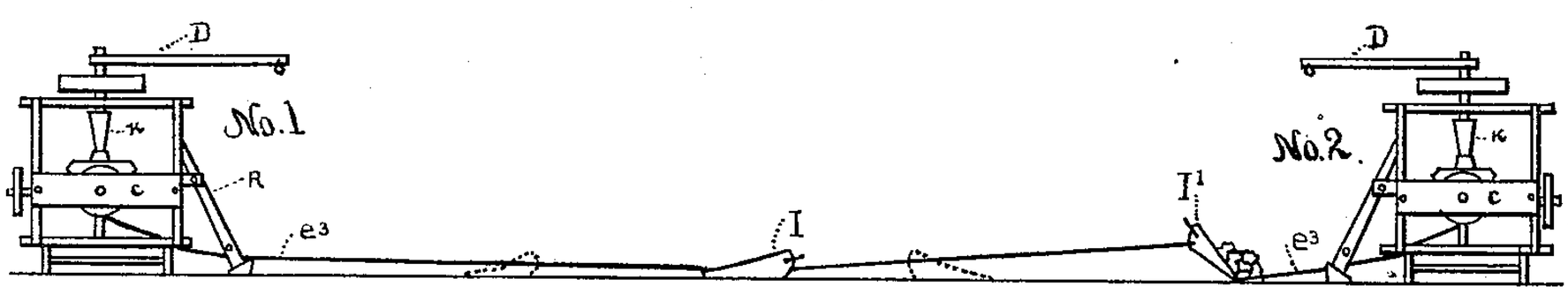


FIG. 3.

FIG. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS E. ROWAN, OF LONDON, OHIO.

MEANS FOR OPERATING DITCHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 371,520, dated October 11, 1887.

Application filed July 23, 1886. Serial No. 208,825. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. ROWAN, a citizen of the United States, residing at London, in the county of Madison and State of Ohio, have invented certain new and useful Improvements in Means for Operating Ditching-Machines, of which the following is a specification.

My invention relates to improvements in means for operating ditching-machines; and the objects of my invention are, first, to provide an effective machine of this class by means of which the process of excavating for ditching purpcses with scrapers is rendered speedy and accurate; second, to so construct said machine as to admit of its being readily moved from point to point. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my improved device. Fig. 2 is a side view of the same. Fig. 3 is an end view, and Fig. 4 represents two machines placed in position for operating the scrapers.

Similar letters refer to similar parts throughout the several views.

a a' represent the side pieces of the frame-work, between which the operating mechanism is located.

b represents a short horizontal shaft having its outer end loosely pivoted in the center of a transverse bearing-piece, *c*, connecting two corresponding ends of the side pieces, *a a'*, and having its inner end bearing in and projecting slightly through a cross-piece, *d*. This shaft *b* has loosely pivoted thereon a spool, *e*, the cylindrical body of which is made to project slightly beyond its inner rim, said projecting portion being provided with a peripheral groove, *e'*, and having its outer end notched to form a clutch-tooth, e^2. Projecting through a slot in the side *a'* of the frame is the handle of a lever, *f*, which, being pivoted to a block secured on the inner side of said side piece, has its inner end resting within the groove *e'* of the spool. By pressure on the handle of the lever *f* the spool *e* may be made to slide forward on the shaft *b* until its clutch-tooth meets and interlocks with a clutch-tooth, *g*, fixed on the shaft *b* at the point where it enters its bearing-piece *d*. On the inner projecting end of the shaft *b*, adjoining its bearing-piece *d*, is mounted a miter-wheel, *h*, the teeth of which are made to engage with the teeth of a miter-wheel, *i*, fixed on a vertical shaft, *k*, having its lower bearings in a bottom cross-piece, *k'*, and its upper portion passing through an upper cross-piece, k^2, above which is rigidly mounted on said shaft a circular block, *l*, having a number of depressions in its outer rim.

Pivoted between and made to project through two cross-pieces, *m* and *n*, made to extend transversely between the side pieces, *a a'*, at equidistant points from the center, is a short shaft, *p*, corresponding with and having, as described for the shaft *b*, a spool, *q*, peripherical groove *r*, and clutch-tooth *s*, the latter adapted to engage with a clutch-tooth, *t*, fixed on the shaft adjoining the point where it enters the cross-piece *m*, through which it passes. Said shaft also carries on its projecting end a miter-wheel, *h'*, which engages with the miter *i*, as described for the miter *h*. The clutch-teeth *s* and *t* may be made to interlock by means of a lever, *u*, made to extend through a slot in the side *a'* and operated as described for the lever *f*. On the remaining projecting end of the shaft *p* is mounted a miter-wheel, *v*, the teeth of which are made to engage with the teeth of a miter, *v'*, set at right angles with the wheel *v* and fixed on the end of a short shaft, *w*, made to project through the side piece *a'*, and having a bearing within the frame-work in a horizontal cross-piece made to extend between the two transverse cross-pieces *n n'*. The shaft *w*, extending outward through the side piece *a'*, is provided on its outer end with a sprocket-wheel, *w'*, having an inwardly-projecting shoulder or hub provided with a peripherical groove, w^2, and having its end notched to form a clutch-tooth, w^3, which latter, when pressed inward by means of a lever, *y*, may be made to interlock with the clutch-tooth w^4, fixed on the shaft *w* near the side piece *a'*. The lever *y* is pivoted at about its middle portion to a block, *y'*, made to project from the side of the side piece *a'*, and has its front end resting within the groove w^2 of the hub of the sprocket-wheel *w'*.

The sprocket-wheel *w'* carries a chain belt, *z*, which also passes over a corresponding

sprocket-wheel, *x*, fixed in front of the wheel *w'* on the outer end of a transverse shaft, *x'*, made to extend through the side pieces, *a a'*, and carrying between said side pieces a spool, N. On the remaining projecting end of the shaft *x'* is provided a ratchet-wheel, P, having a pawl, P', adapted to engage therewith, the latter being pivoted at a point on the outer side of the side piece *a*, as shown.

Pivoted to suitable blocks, S, made to project from the outer side of the side piece *a*, are two arms, R R. Said arms extend below the bottom side pieces, and are secured, respectively, at their lower ends to the ends of a horizontal runner, T, which, when in its normal position, rests on the ground. A short distance above this runner T is loosely pivoted between the arms R a roller, U.

The frame-work of the machine is made to rest on suitable connected trucks, A, having wheels A'. The spools *e* and *q* are provided, respectively, with ropes e^3 and *q'*, secured to and wound thereon. These ropes are made to pass outwardly under the bottom of the side piece *a*, and, extending between the roller U and runner T, are continued to the desired length.

Two of the above-described machines having been placed transversely across the proposed line of ditch at a convenient distance apart, so that their sides *a* face each other, their corresponding ropes, e^3 and *q'*, are each secured at their outer ends to the front portion of ordinary scrapers, I and I'. Said scrapers have their rear ends connected by an intermediate rope, and are of such distance apart that when the scraper I' is brought near its machine the scraper I is about midway between the two machines.

Fixed on the top of the shaft *k*, or inserted within one of the depressions in the block *l*, is one end of a long arm or lever, D, from the outer end of which may be suspended a singletree or other well-known device for hitching a horse thereto.

The scrapers I and I' being located as last above described and the clutch-teeth e^2 and *s* of machine No. 1 being interlocked, respectively, with the clutch-teeth *g* and *t*, said clutch-teeth being disengaged on machine No. 2, a horse hitched to the arm D of machine No. 1 is made to travel in a circle about the machine, thus imparting a revolving motion to the shaft *k*, which, through the miters *i*, *h*, and *h'*, communicates motion to the shafts *b* and *p*, causing the ropes e^3 and *q'* to wind on their respective spools, thus propelling the scrapers I toward the machine. When these scrapers have reached a point near said machine, the scrapers I' will have reached the starting-point of the scrapers I, and the latter having been dumped and the interlocked clutch-teeth thrown out of gear, the same operation is performed by machine No. 2 as above described for machine No. 1, said machine No. 2 continuing in motion until the scrapers I have reached their original position.

In case it is desired to move the machine to a different point, the outer end of the rope M, secured to and adapted to be wound on the spool N, is secured to a stake driven in the ground at a distance from the machine. The clutch-teeth *s t* and w^3 w^4 are made to interlock, and, the shaft *k* being revolved, motion is communicated through the shaft *p*, miter-wheels *v v'*, and shaft *w* to the sprocket-wheel *w'*, and thence through the chain belt *z* to the sprocket-wheel *x*, its shaft *x'*, and spool N. The revolution of the latter causes the rope M to be wound thereon, and thus causes the machine to travel forward on the wheels A'. The pawl P' operates to prevent the shaft *x'* from turning backward.

By the construction and operation above described it will be seen that two pairs of scrapers may be operated at the same time in a rapid and effective manner.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the connected side pieces, *a a'*, of the frame-work, one of said side pieces having pivoted to its outer side the arms R, carrying the rope-guide roller U and ground-runner T, with the vertical shaft *k*, having the miter-wheel *i*, set to engage with the miters *h h'*, fixed on the end of shafts *b* and *p*, carrying spools *e* and *q*, having ropes e^3 and *q'*, and clutch-teeth e^2 *s* and *g t*, substantially as and for the purpose specified.

2. The combination of the shaft *k*, having the miter-wheel *i*, set to engage with the miter-wheels *h h'*, fixed on the ends of shafts *b* and *p*, carrying spools *e* and *q*, and clutch-teeth e^2 *s* and *g t*, with the miters *v v'*, shaft *w*, carrying sprocket-wheel *w'* and interlocking teeth w^3 and w^4, chain belt *z*, and sprocket-wheel *x*, fixed on the end of shaft *x'*, the latter carrying the spool N and ratchet-wheel P and pawl P', substantially as and for the purpose specified.

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Witnesses:
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C. R. GILMORE.