

(No Model.)

E. E. RENSCHAW.
DITCHING MACHINE.

3 Sheets—Sheet 1.

No. 373,484.

Patented Nov. 22, 1887.

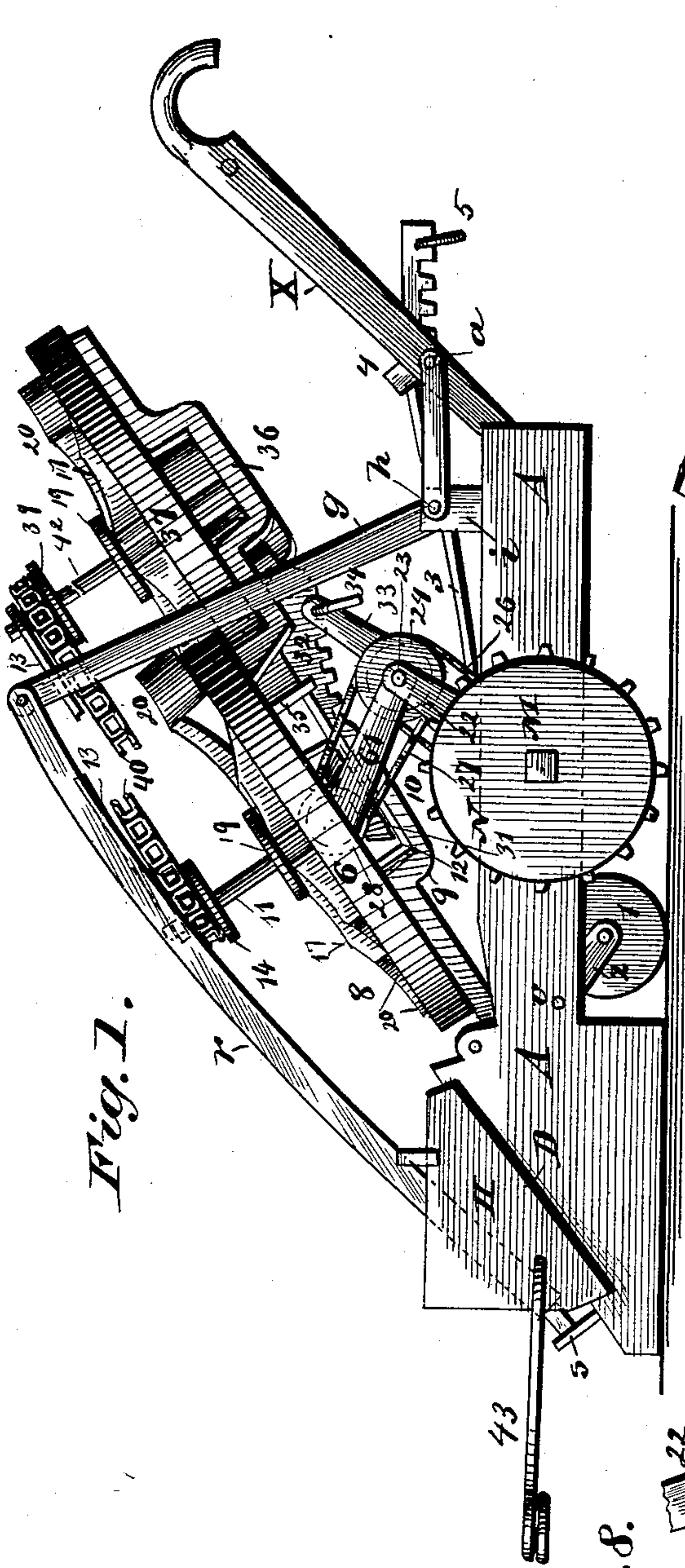


Fig. 1.

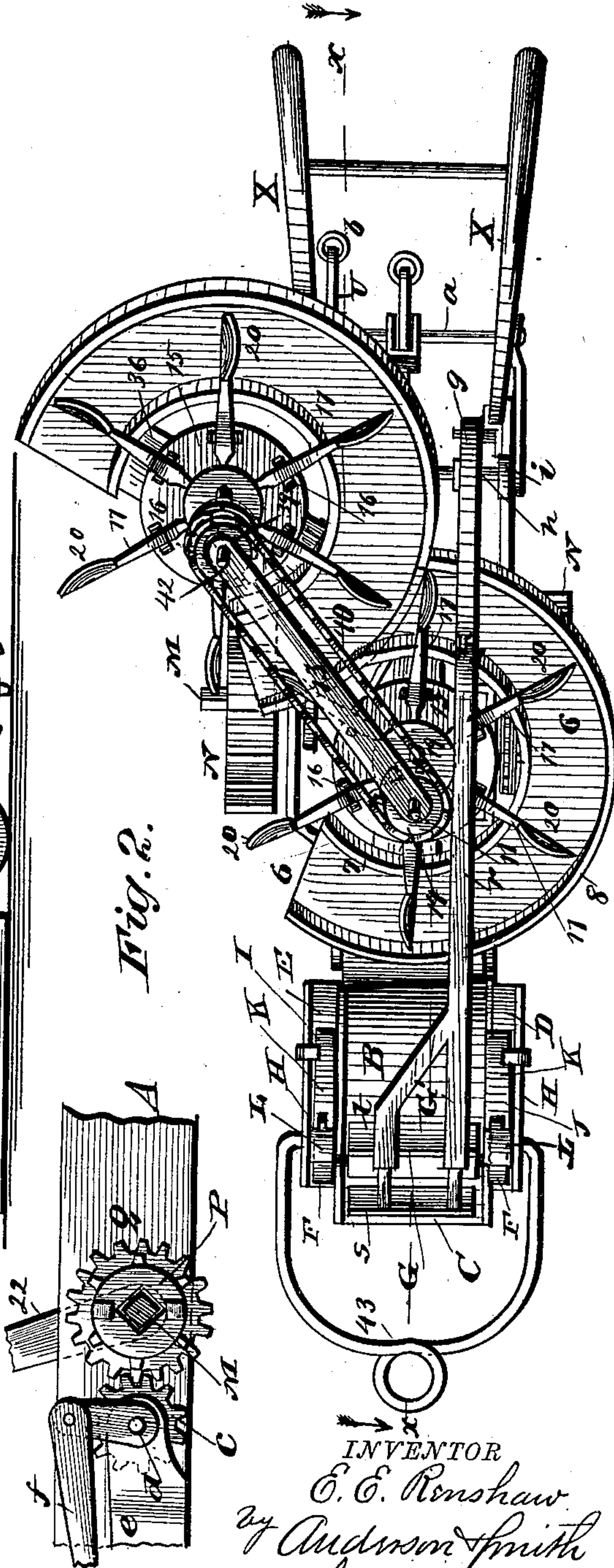


Fig. 2.

Fig. 3.

WITNESSES

B. Fugitt.
P. C. Masi.

INVENTOR

E. E. Renschaw.
by Anderson Smith
his Attorneys

(No Model.)

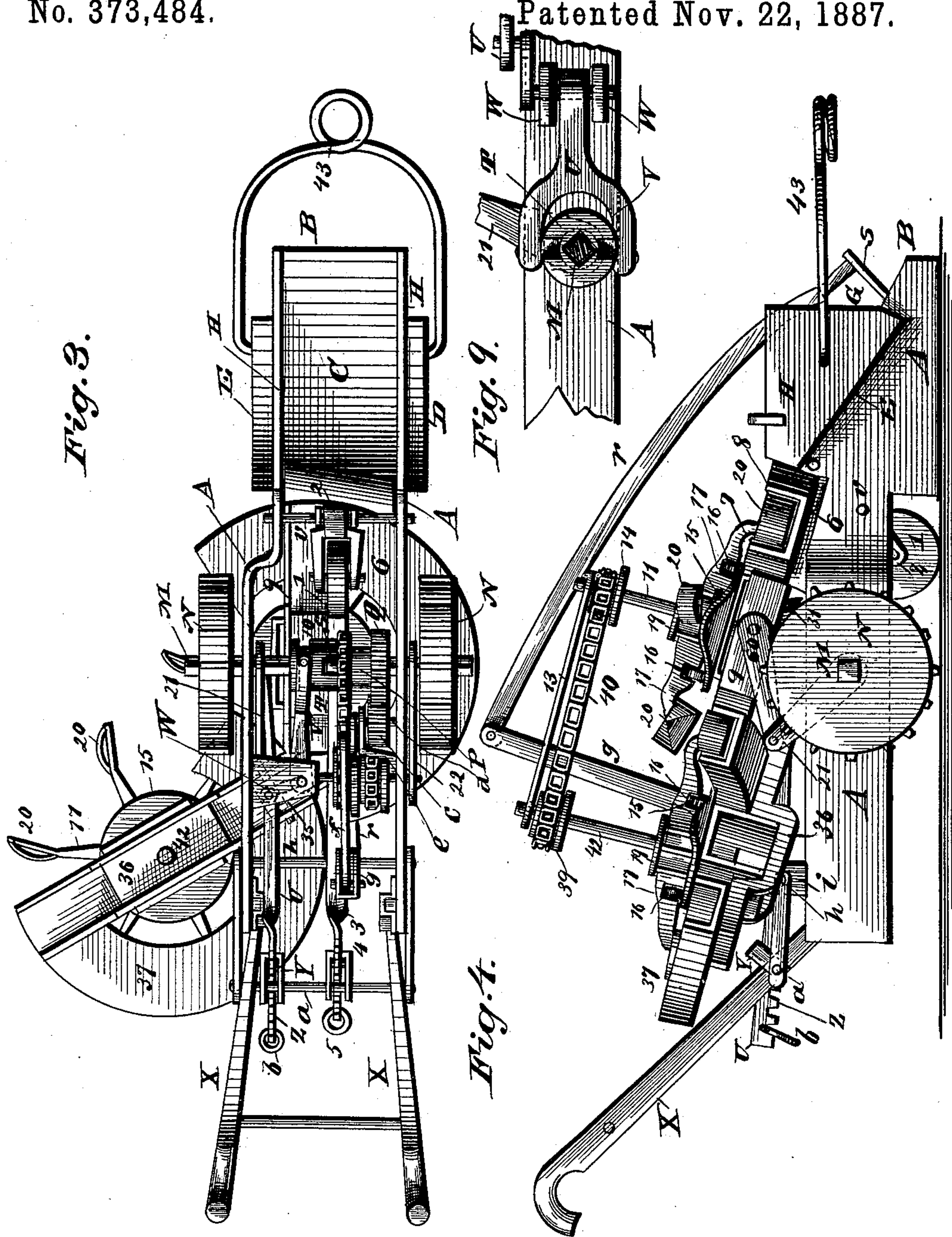
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WITNESSES
B. Fugitt.
R. Blasi.

INVENTOR
E. E. Renshaw,
by Anderson & Smith
his Attorneys

(No Model.)

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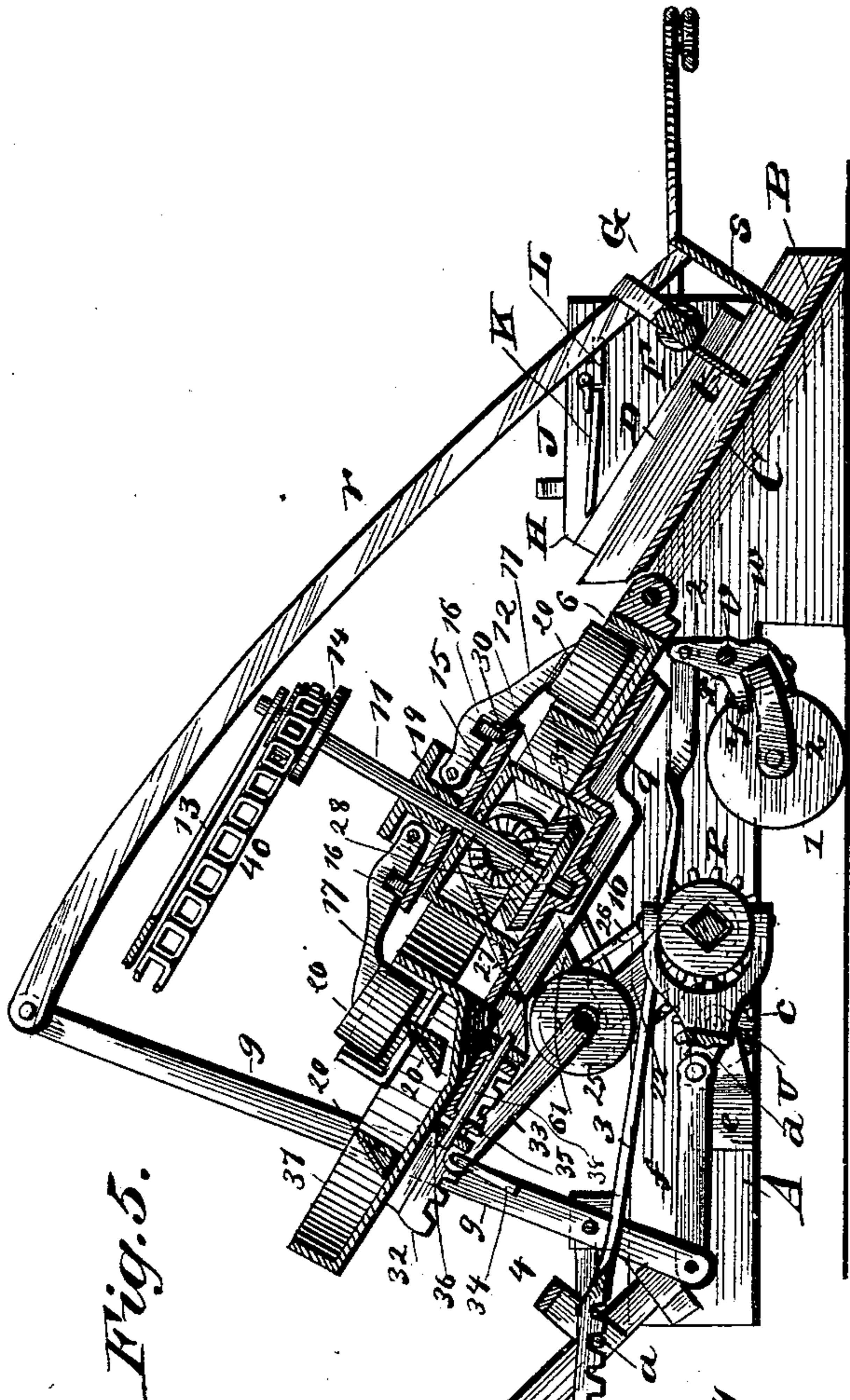


Fig. 5.

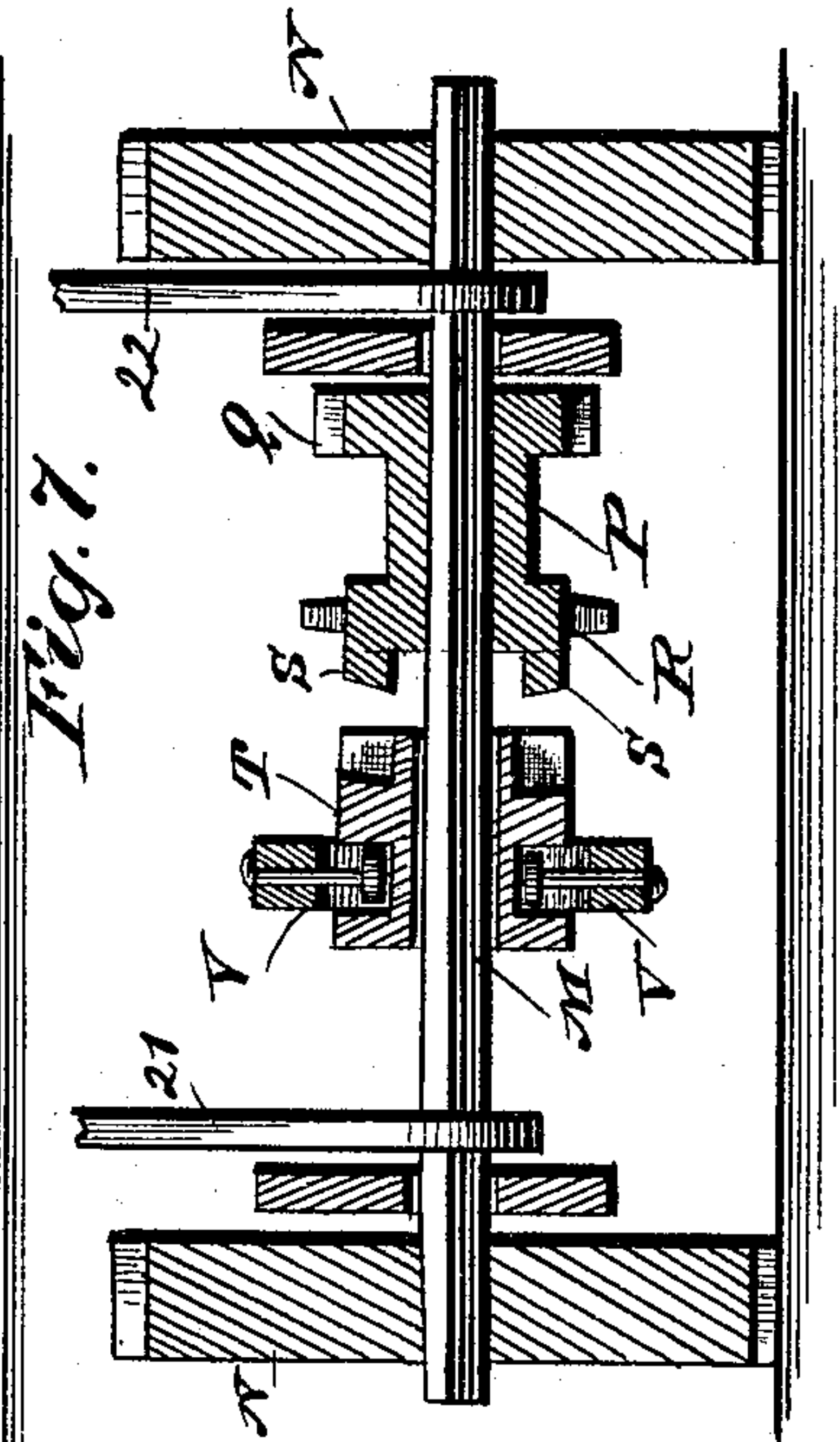


Fig. 7.

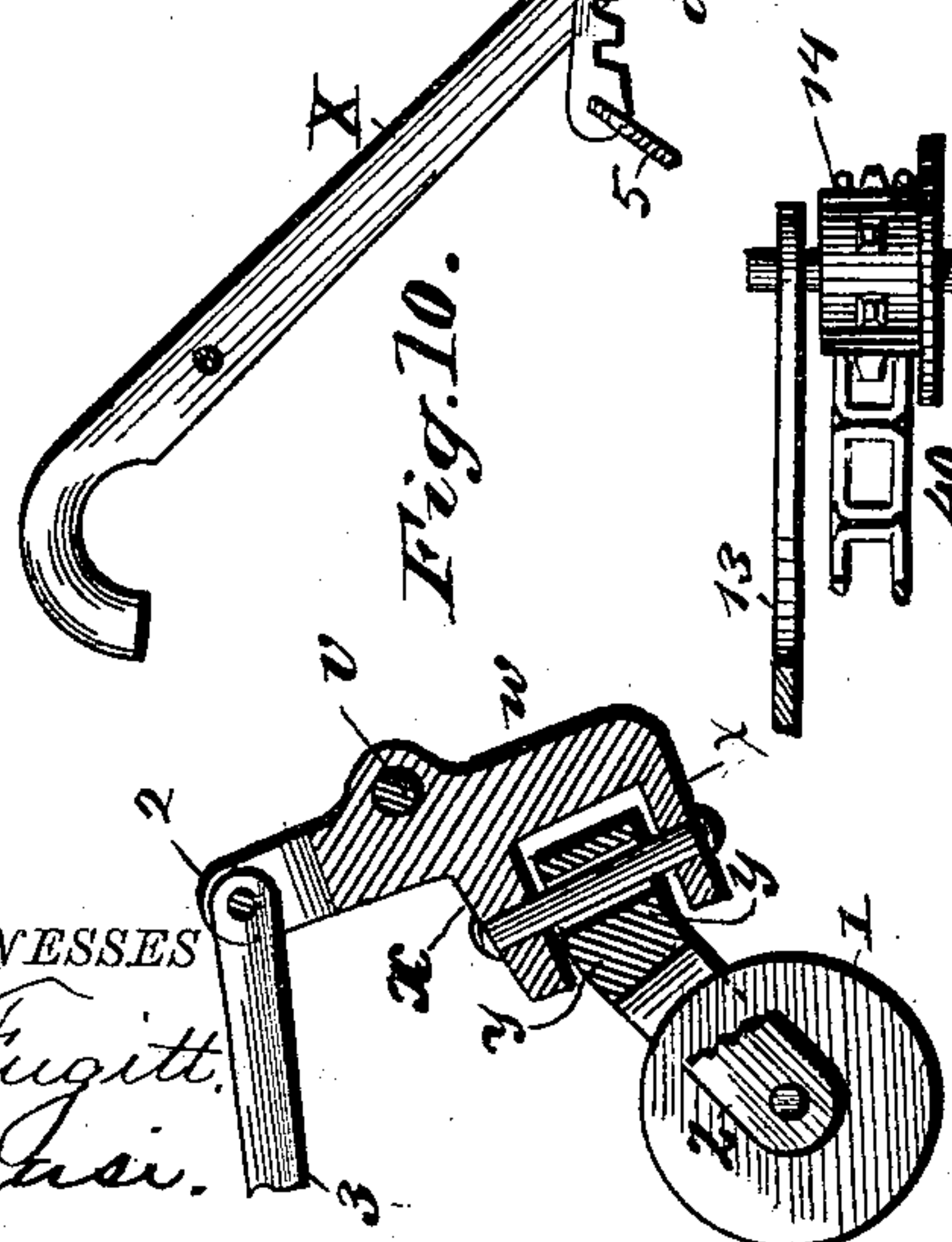


Fig. 10.

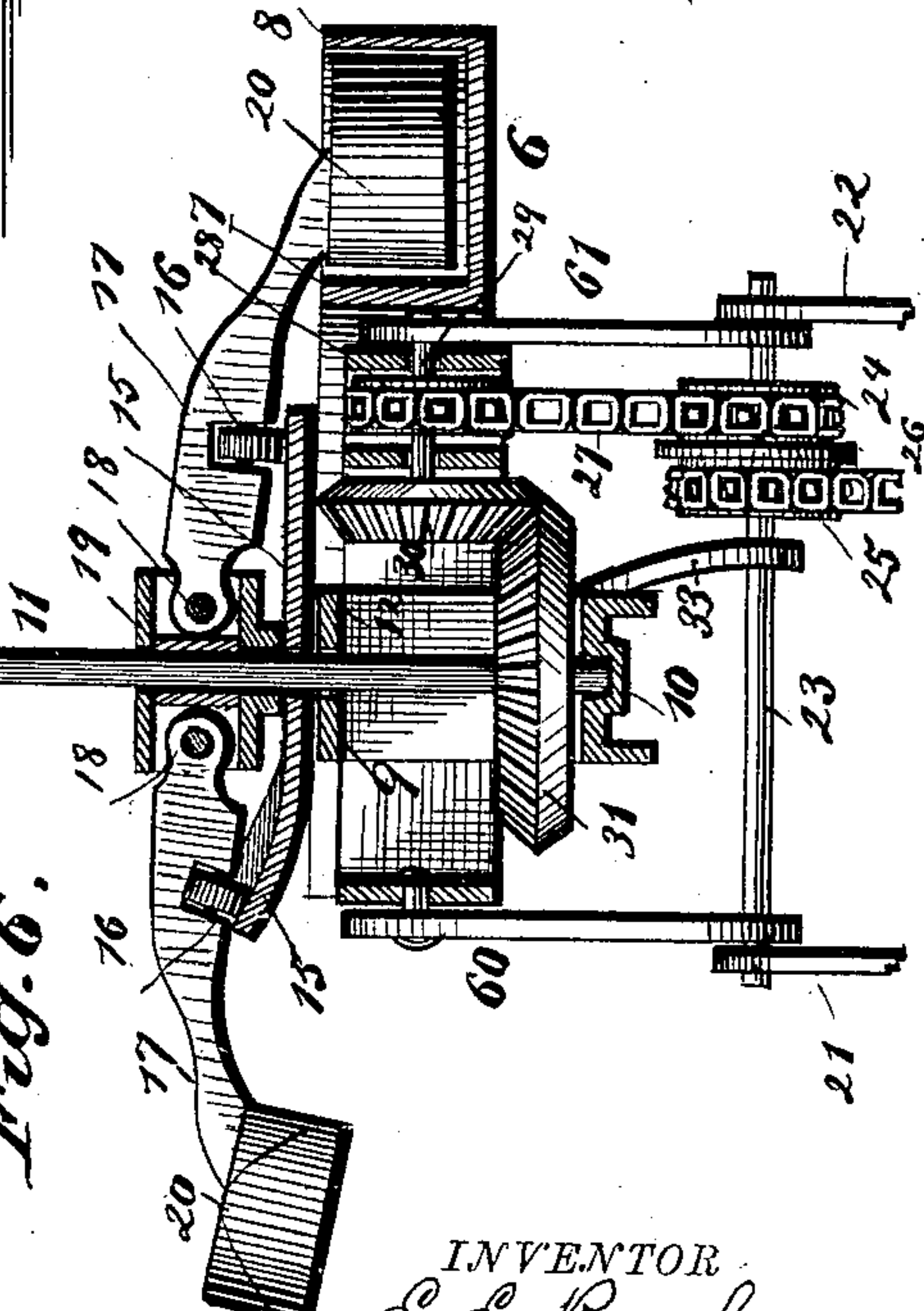


Fig. 6.

WITNESSES
B. Fugitt.
P. C. Masi.

INVENTOR
E. E. Renshaw
by Anderson & Smith
Attorneys

UNITED STATES PATENT OFFICE.

ELMER E. RENSHAW, OF GOLCONDA, ILLINOIS.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,484, dated November 22, 1887.

Application filed February 15, 1887. Serial No. 227,731. (No model.)

To all whom it may concern:

Be it known that I, ELMER E. RENSHAW, a citizen of the United States, and a resident of Golconda, in the county of Pope and State of Illinois, have invented certain new and useful Improvements in Ditching-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation
15 of a side elevation. Fig. 2 is a plan view. Fig. 3 is a bottom plan view. Fig. 4 is a side elevation of the side opposite that shown in Fig. 1. Fig. 5 is a vertical longitudinal section on the line *x x*, Fig. 2. Fig. 6 is a trans-
20 verse vertical section through the front platform. Fig. 7 is a similar view through the main axle. Figs. 8, 9, and 10 are detail views.

My invention relates to ditching and grading machines; and it consists in the construction
25 and novel combination of parts, as hereinafter set forth.

Referring by letter to the accompanying drawings, A designates the main frame of the machine, which frame is provided at its front
30 end with scraper B, the lower edges of the sides of the latter being horizontal. The bottom proper, C, of the scraper is inclined from below upward and backward from its front end or point.

At each side, and just above the bottom C, the scraper B is provided with inclined tracks D E, upon which the rake-rolls F travel when the rake G is drawn upwardly on the scraper. Above the inclined tracks D E, and secured
40 to the inner faces of the sides H H of the scraper B, are the horizontal laterally-extended tracks I J, the rear portions, K, of which are hinged to the rear ends of the front or stationary portions, L, of the tracks I J, and
45 extend to and normally rest upon the inclined tracks D E, the purpose of said horizontal tracks being to give to the rake a forward horizontal movement to permit it to fall upon the collected earth at the lower end of the
50 scraper preparatory to the next backward and upward movement.

M is the axle of the machine, which axle is journaled in bearings in the sides of the main frame A at a suitable distance in rear of the scraper B. The axle M revolves in its bear-
55 ings, and is provided on its ends outside of the main frame with traction-wheels N N, which latter are secured on the rectangular ends of the axle and revolve the axle when the machine is drawn forward.

The axle M is provided with a sleeve, P, the bore of which is circular in cross-section. Said sleeve P is provided on its outer end with a pinion, Q, and on its inner end with a sprocket-
60 pinion, R, which sprocket-pinion is provided on its inner face, or the face nearest to the middle of the axle, with diametrically-opposed studs S, which studs S, when the mechanism is in gear, engage seats in a sliding clutch, T, adapted to slide lengthwise on the axle M.
70 The sliding clutch T is operated by a cranked lever, U, which is bifurcated at its front end to receive the sliding clutch T, which clutch is pivoted between the arms of the bifurcation V. The cranked lever U is fulcrumed in a seat in
75 the inner end of the arm W, which arm projects inwardly from one side of the main frame A a short distance in rear of the axle M. The cranked lever U extends back between the
80 handles X of the machine and through a guide-loop, Y, and is notched in its lower edge at Z, to engage the round *a* of the handles. The cranked lever U is provided at its rear end with a ring, *b*, by which to grasp it to operate
85 said lever to throw the machine in and out of gear.

In rear of the pinion Q and engaging therewith is a smaller pinion, *c*, the shaft *d* of which is a crank-shaft and is journaled in bearings in one side of the main frame and in a bracket,
90 *e*, secured to the inner face of said side of the main frame. The crank-shaft *d* is connected by a pitman-rod, *f*, to the lower end of an upwardly-extended lever, *g*, which latter lever is fulcrumed on a transverse rod, *h*, supported
95 in the upper ends of vertical arms *i i*, rising from the main frame near the rear end of the latter.

To the upper end of the lever *g* is hinged the rear end of the rake-rod *r*, which extends
100 forward and is bifurcated at its forward end, as at G', and is provided with two depending

blades or scrapers, *s t*, the rear one, *t*, of which is provided with the rake-rolls *F*, before mentioned. In the sides of the main frame, and just in rear of the downwardly-projecting side walls, *H H*, of the scraper *B*, is rigidly secured the ends of a transverse rod, *v*, at the middle portion of which rod *v* is hinged an angular bracket, *w*. Between the downwardly-projecting arms *x x* of the bracket *w* the connecting-bar *y* of the vertical arms *z z* is pivoted to swing sidewise on its pivot. Between the lower ends of the arms *z z* a smaller supporting-wheel, *1*, is journaled. To the horizontally-projecting rearwardly-extending arm *2* of the bracket *w* the front end of a shifting-rod or bar, *3*, is hinged or pivoted. The shifting rod or bar *3* extends back beyond the round *a* of the handle *X*. The rear end of the shifting-rod *3* is notched or provided with teeth in its lower edge, which teeth are adapted to engage the round *a*. The rear end of the shifting-rod *3* passes through a guide-loop, *4*, on the round *a*, and is provided in its extreme rear end with a ring, *5*, which is used to manipulate the shifting-rod to move the supporting-wheel *1* into contact and from contact with the ground.

6 designates the front platform, which in outline is in the shape of a horseshoe, having vertical upwardly-extending flanges or sides *7* and *8* along its inner and outer edges, respectively. To the under face of the platform *6*, near each end thereof, are secured the ends of a flanged transverse bar, *9*, having an angular depression, *10*, intermediate of its ends. The depression *10* forms the lower bearing for the lower end of the vertical shaft *11*. A rectangular bracket, *12*, rises from the depression *10* and forms the intermediate bearing for the vertical shaft *11*, the upper bearing of said shaft *11* being in the front end of a connecting-bar, *13*. Just below the end of the connecting-bar *13* the vertical shaft *11* is provided with a flanged sprocket-wheel, *14*. Upon the upper face of the rectangular bracket *12* a cam-disk, *15*, is secured, and forms the track for the friction-rolls *16*, journaled in bearings of the sweep-arms *17*, near the inner ends of the said sweep-arms. The sweep-arms *17* at their inner ends are hinged or pivoted in seats *18* in a hub, *19*, secured to the vertical shaft *11*, so that when the shaft and hub are revolved the arms *17* will be carried around by them. At their outer ends the arms *17* are provided with curved blades *20*, the joints or front ends of said blades being curved in the direction of the line of travel of the blades.

To the axle *M*, and close to the sides of the main frame *A*, the lower ends of two upwardly and rearwardly extending arms, *21* and *22*, are secured, their upper ends extending beyond the peripheries of the traction-wheels. The upper ends of the arms *21* and *22* are provided with bearings, in which the ends of a transverse shaft, *23*, are journaled. Hinged arms *60* and *61* connect the front platform to the transverse shaft *23*. The shaft *23* is pro-

vided with a double sprocket-pulley, *24 25*, which is secured to said shaft *23* and revolves therewith when the latter is operated. The inner portion of the sprocket-pulley *25* is connected by an endless sprocket-chain, *26*, with the sprocket-pinion *R* on the sleeve *P*. The outer portion, *24*, of the double sprocket-pulley is connected by an endless sprocket-chain, *27*, to a sprocket-pulley, *28*, journaled on a shaft, *29*, having bearings in a recess in the front platform, *6*. At its inner end the shaft *29* is provided with a miter-pinion, *30*, which engages and drives a miter-gear, *31*, on the vertical shaft *11* of the sweep-arms *17*.

The front platform, *6*, is hinged to the rear end of the upper portion of the inclined scraper *B*, and is provided on its lower face with a rearwardly-extending notched bar or rack, *32*. The transverse shaft *23* is provided with a rearwardly and upwardly extending prop or supporting-arm, *33*, which is bifurcated in its upper end and is provided with a crank-rod, *34*, which is adapted to engage either one of the notches of the rack *32*, to support the front platform at the desired inclination. At its rear end, and at one side of the longitudinal middle line of the front platform, said front platform is provided with an angular laterally-projecting depending bracket-arm, *35*, to which the inner end of the flanged transverse bar *36* of the rear platform, *37*, is secured by a rod, *38*, passed through aligned seats in the bracket-arms *35* and transverse bar *36*.

The rear platform, *37*, is similar in construction to the front platform proper, except as to the gearing by which the former platform is driven.

The upper end of the shaft *42* of the rear platform, *37*, is provided with a sprocket-wheel, *39*, which is connected by a sprocket-chain, *40*, with the sprocket-wheel *14* near the upper end of the vertical shaft *11*. The upper bearing of the shaft *42* is in the rear end of the connecting-bar *13*. The rear platform, *37*, is removable, and may be replaced by a larger platform similarly constructed when it is desired to grade wider.

The cam-disks prevent the sweep-arms of the two platforms from interfering with each other in moving the dirt along their respective platforms.

A draft iron or bail, *43*, is attached to the front of the machine, by which to draw the machine along.

An ordinary plow is first used to loosen the dirt, and the ditching-machine is afterward employed to elevate the dirt and deposit it at the sides of the ditch.

The rake at the front of the machine feeds the dirt regularly to the sweeps on the front platform. The rake makes a trip to every other sweep, depositing the dirt before one sweep and behind the one in front, so that each sweep performs the same amount of work in conveying the dirt to the rear platform,

from which it is carried by the sweeps on the latter platform and deposited it at the side of the ditch. As the ditch deepens, the platform can be elevated through the media of the rack-bar and the hinged supporting-arm or prop, and can again be lowered when necessary.

When the small wheel in rear of the inclined scraper is thrown in contact with the ground, the traction-wheels may be raised from the ground by lifting on the handles, and the machine may be drawn over the road or ditch without operating the mechanism.

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

1. The combination, with the axle provided with the traction-wheels and the main frame provided at its front end with the scraper having inclined tracks and horizontal tracks having the rear hinged portions, of the front platform hinged to the scraper, the rear platform connected to an extension of the front platform, the cam-disks on said platforms, the vertical shafts provided with hubs and sprocket-pulleys, the bar connecting the vertical shafts, the sprocket-chain connecting the sprocket-pulleys on the vertical shafts, the reciprocating rake, and the sweeps provided with friction-rolls and hinged in the hubs of the vertical shafts, substantially as specified.

2. The combination of the main frame, the traction-wheels, the axle provided with the upwardly-projecting arms, the pinion sprocket-wheel and sliding clutch on the axle, the cranked pinion engaging the pinion on the axle, the vertical lever connected with the

cranked pinion and the rake, the transverse shaft supported in the upwardly-projecting arms and provided with the double sprocket-pulley, the front hinged platform provided with a miter-gear on its vertical shaft and a miter-pinion engaging said miter-gear, the sprocket-chains connecting the miter-pinion with the double sprocket-pulleys and the sprocket-wheel on the axle, the notched bar on the lower face of the front platform, the hinged prop provided with the crank-rod in its upper end, the removable rear platform, and the hinged and connected sweeps on the front and rear platforms, substantially as specified.

3. The combination of the main frame, scraper, traction-wheels, front and rear platforms, and mechanism, substantially as described, for connecting and operating the hinged sweeps, the hinged supporting-wheel, and the notched lever or bar for raising and lowering the hinged supporting-wheel, substantially as specified.

4. The combination of the horseshoe-shaped platform, the flanged transverse bar provided with the central depression and the angular bracket thereon, the vertical shaft provided with a flanged hub and cam-disk, and the hinged sweeps provided with friction-rolls in the lower edges of their arms, substantially as specified.

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

ELMER E. RENSHAW.

Witnesses:

W. D. VAUGHN,
J. C. THOMPSON.