

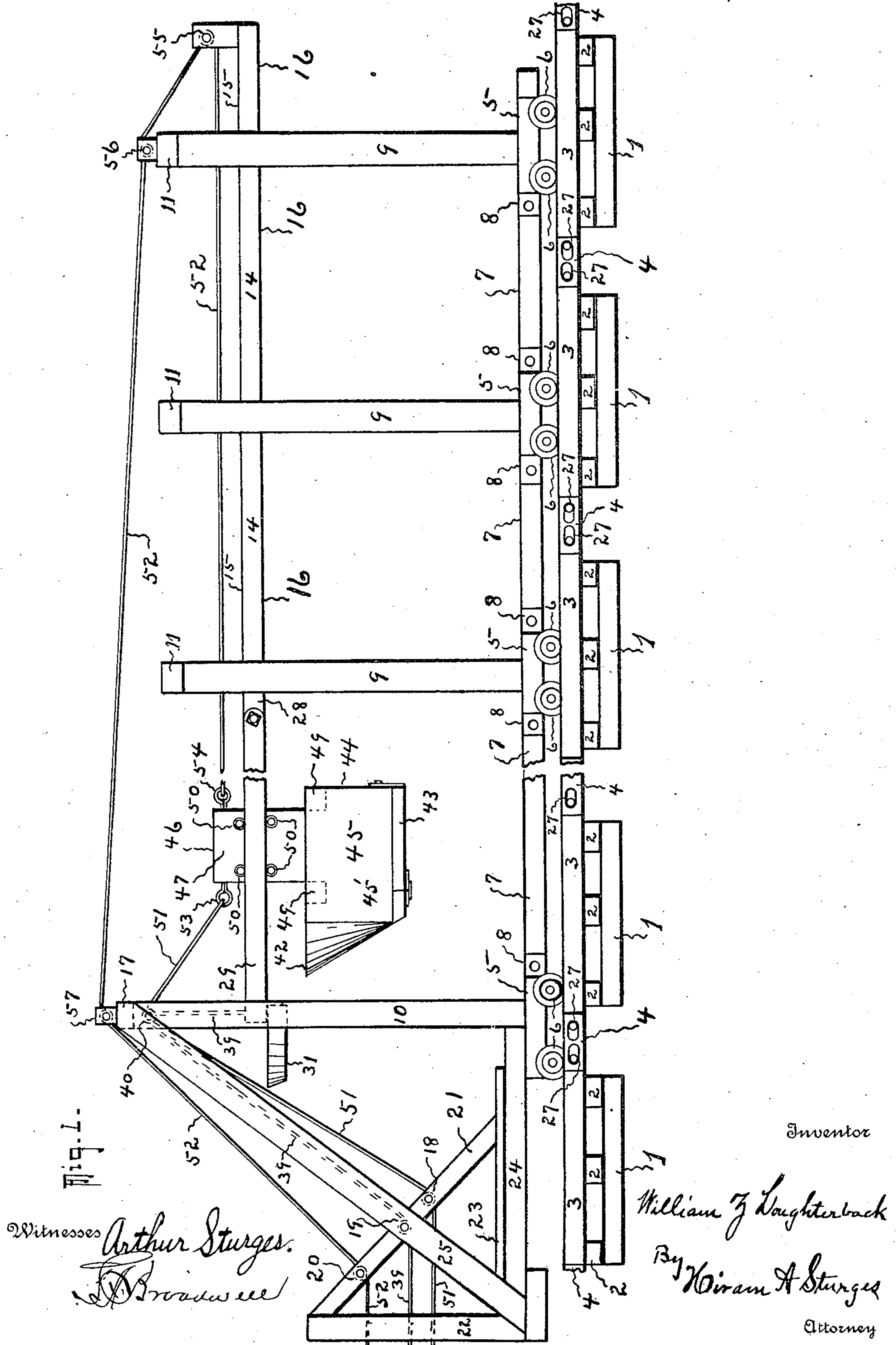
No. 869,855.

PATENTED OCT. 29, 1907.

W. Z. LAUGHTERBACK.
EXCAVATING AND FILLING MECHANISM.

APPLICATION FILED DEC. 20, 1906.

4 SHEETS—SHEET 1.



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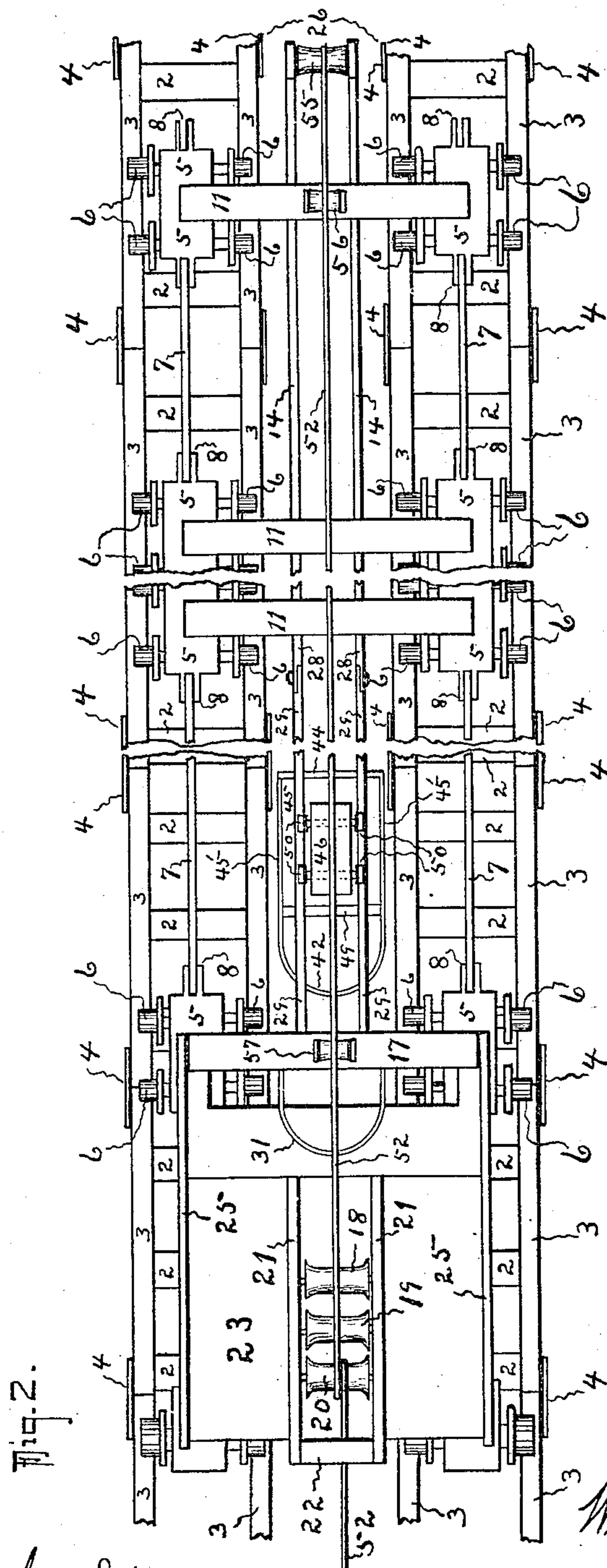


Fig. 2.

Witnesses

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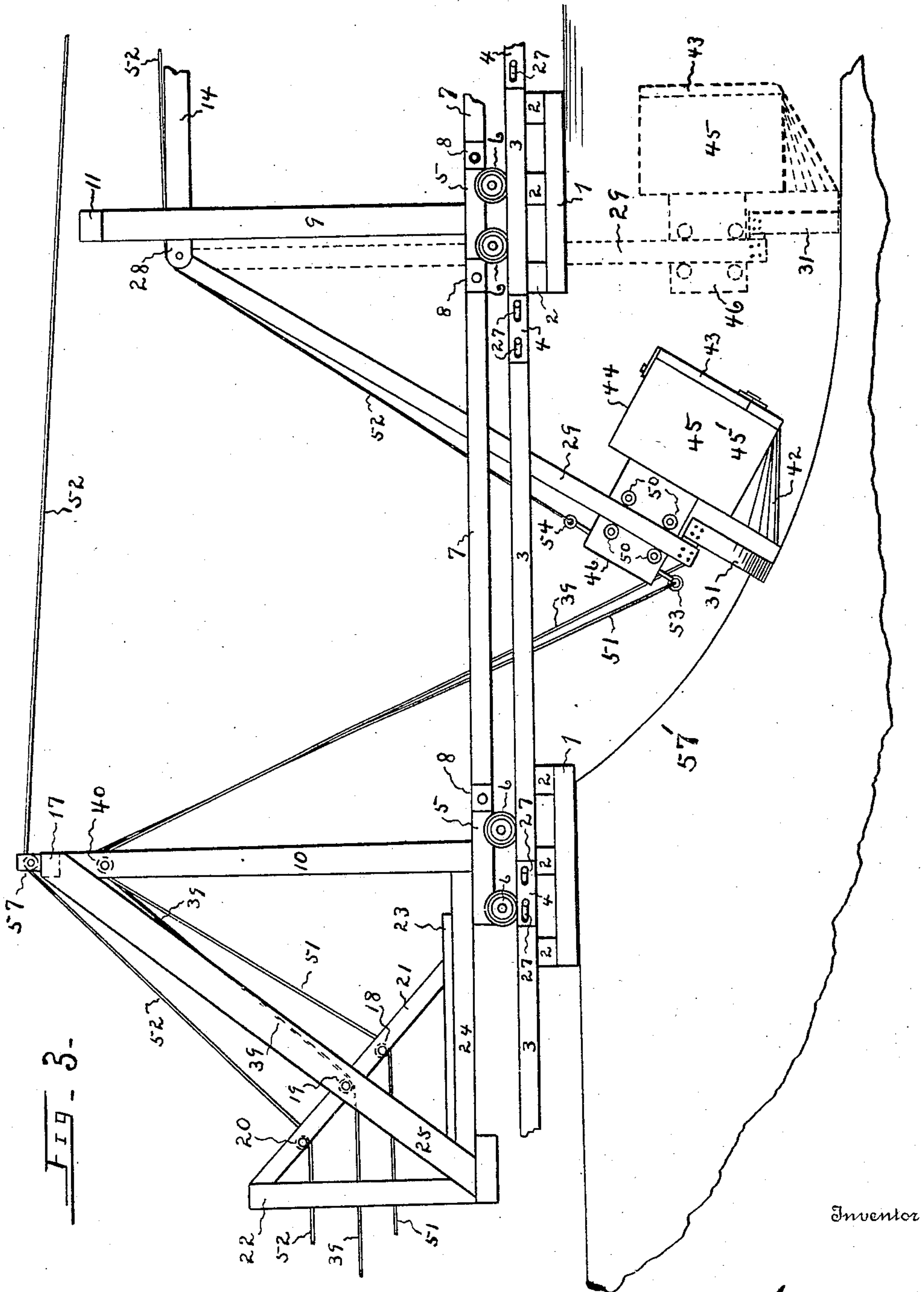
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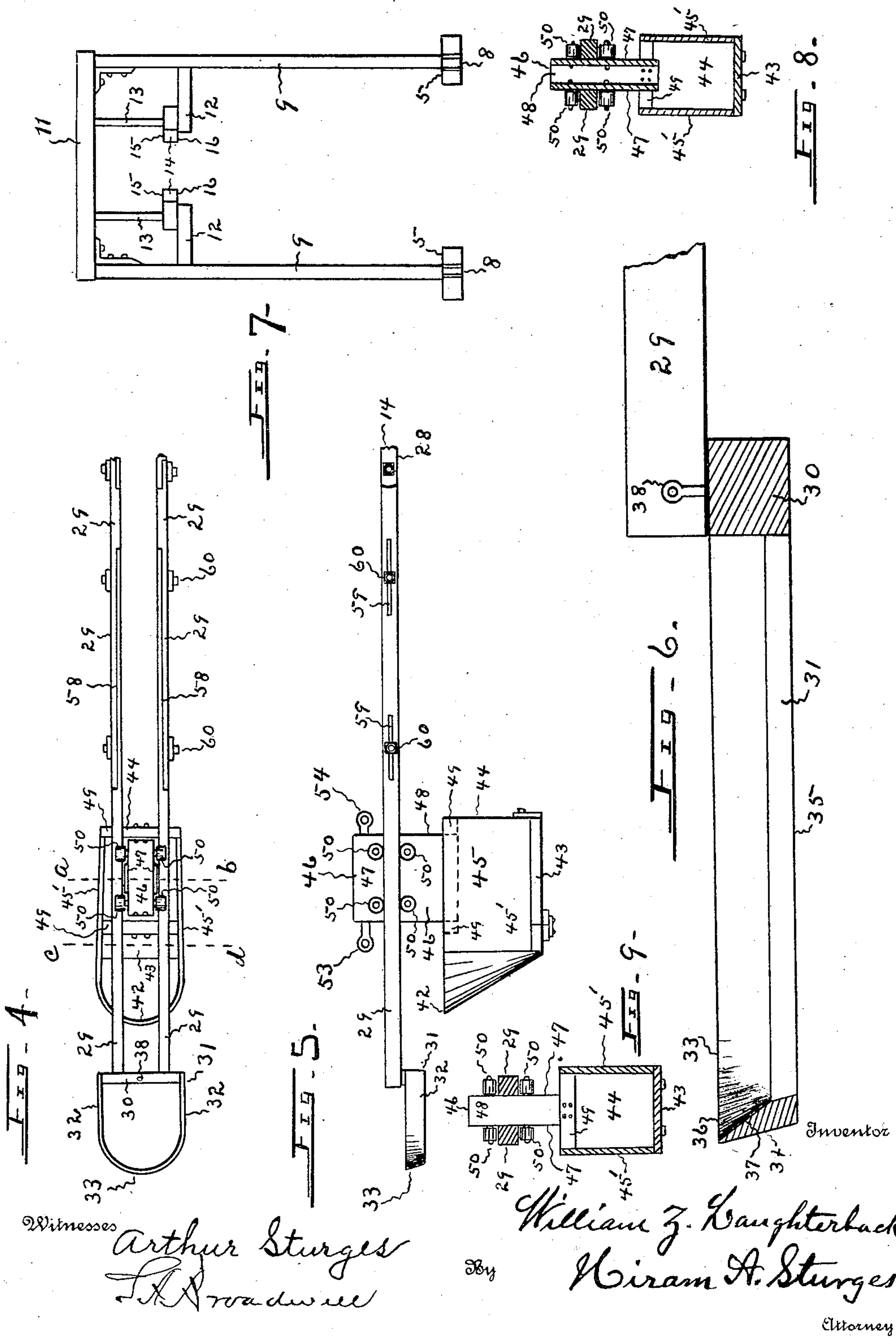
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

WILLIAM Z. LAUGHTERBACK, OF SOUTH OMAHA, NEBRASKA, ASSIGNOR OF ONE-FOURTH
TO JOHN D. COOK, OF SOUTH OMAHA, NEBRASKA.

EXCAVATING AND FILLING MECHANISM.

No. 869,855.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed December 20, 1906. Serial No. 348,748.

To all whom it may concern:

Be it known that WILLIAM Z. LAUGHTERBACK, a citizen of the United States, residing at South Omaha, in the county of Douglas and State of Nebraska, has invented certain new and useful Improvements in Excavating and Filling Mechanism, of which the following is a specification.

This invention relates to improvements in excavating and filling mechanism of the class adapted for use in connection with laying sewer or water pipe; and has for its primary object the presentation of means for forming long and narrow excavations of any desired depth, and conveying the excavated soil to the rear part of the trench; the invention is intended for use in making excavations for sewer construction or for the laying of a system of water pipes in straight lines or on curves, removing the soil from the front thereby preparing the trench ready for reception of the pipe, and conveying the excavated portion to the rear and dumping it upon the pipe already laid.

The invention has reference to a series of adjustable platforms presented in sections, a lengthwise movable framework which sustains a trackway, a knife-bearing, swinging track-portion, and to the employment of a receiving-bucket having a guide-plate secured thereon, which is vertically sustained and movable upon the trackways, the knife-bearing swinging track-portion and bucket being under control of cables.

With these and other objects in view, the invention presents a new combination and arrangement of parts as described herein, illustrated by the drawings and pointed out by the claims.

In the drawings Figure 1 represents a vertical side view of the invention, being broken centrally, to include the rear section. Fig. 2 is a plan view, being also broken centrally. Fig. 3 is a vertical side elevation of the front section, showing the receiving and conveying bucket in connection with an unexcavated portion of earth, this figure being partly broken away; the dotted lines indicating relative position of parts. Fig. 4 is a plan view, to more clearly show the construction of the knife-bearing, swinging track-portion and securing and conveying-bucket. Fig. 5 indicates a vertical side view of the parts shown in Fig. 4. Fig. 6 is an enlarged detail showing formation of cutting-blade. Fig. 7 is a vertical figure indicating a part of the framework. Fig. 8 is a view on line *a b* of Fig. 4 looking to the rear of the bucket. Fig. 9 is a view on line *c d* of Fig. 4, also looking to the rear of the receiving and conveying-bucket.

Referring to the several figures of the drawing, the numeral 1 (Figs. 1-3) indicates a lengthwise bed-plate and 2 transverse supporting plates; and upon and near the free ends of supporting plates 2 are secured the lengthwise extending track-rails 3. The track-rails

thus shown are presented as a series, and are joined end to end by means of clevis-members 4.

Platforms 5 are mounted upon wheels or rollers 6; between platforms 5 are secured extension-plates 7, their ends being pivotally secured in trunnions 8 formed on the ends of these platforms. Upon platforms 5 are secured, in pairs, upwardly extending bearing-posts 9, upon the front platform 5 being a pair of bearing posts 10 preferably higher than posts 9, the upper ends of each pair of posts 9 and 10 being provided with the cross-beam 11 (Figs. 2-7). Intermediate the upper and lower ends of bearing-posts 9 are secured inwardly extending arms 12 (Fig. 7) supported by vertical hangers 13 to cross-beams 11, and secured in any convenient manner upon arms 12 are lengthwise extending bucket-conveying tracks 14 having upper and lower parallel surfaces 15 and 16. Bearing posts 10 are provided with a cross-beam 17, and in order to provide a suitable support for pulleys 18 19 and 20, hereafter more particularly mentioned I construct any suitable holding-frame, as indicated at 21, secured to head 22 and platform or floor member 23, this platform being secured to horizontal beams 24, the latter being secured to the front platform 5 and post 10 and reinforced by means of the inclined bracing-plate 25 having its ends secured upon beams 24 and cross-beam 17.

From the description it will be seen that a pair of trackways are adjacently laid and are maintained uniformly equi-distant by means of cross pieces 11, secured upon the upper ends of vertical posts 9, these posts being secured upon platforms 5; this uniform and lengthwise space between the platform-tracks is indicated at 26 (Fig. 2), being that part of the ground where the sewer is to be constructed. In practice it has been found an advantage to employ lengthwise sections of about 16 feet in extent, and as these sections are connected by a clevis 4, a rear section may be readily detached and connected at the front, as required, so that the whole route to be traversed along the course of the sewer may be accomplished by a few of these sections used in alternation; and it is shown that rollers 6 have broad bearing surfaces, this being desired in part for the reason that the course of a sewer may be curved and the pair of trackways 3 must therefore conform to such curvature, and therefore each clevis 4 is provided with axle slots 27 which allows a slight horizontal swing of the axles of rollers 4, trunnions 8 not being closely fitted to the ends of extension-plates 7 also permitting a similar movement. While tracks 3 are secured in sections, and are stationary, it will be understood that platforms 5 and 23 posts 9 and 10 and all of the frame-work and mechanism sustained thereon may have a lengthwise movement upon tracks 3.

Upon the ends 28 of tracks 14 I mount the swinging tracks or trackway 29 adapted to have a swing of about

90 degrees in alinement with tracks 14, the outer ends of tracks 29 being secured rigidly to the transverse head 30, and preferably upon the outer ends of head 30 is rigidly secured the cutting-blade 31. This cutting-blade 5 or knife is formed preferably with parallel sides 32 (Figs. 4 and 5), and has an integrally formed circular blade-arm or front 33, the blade having an outer wall 34 (Fig. 6) extending outwardly and divergent or flaring from the base 35 to the cutting edge 36, and preferably 10 having an inner wall 37 a part of which is formed on a plane convergent with the outer wall 34.

Upon head 30 within any securing means as upon eye-bolt 38 is secured cable 39 which passes upward to the double-pulley 40 secured midway between posts 10 15 and thence passes downward to pulley 19 and is under any convenient controlling power or means for raising or lowering tracks 29 at the will of the operator.

I construct a bucket 45 having a circular front 42 formed outwardly flaring from the hingeable bottom 43, 20 the upper circular front conforming to the curvature of the cutting-blade 31, the bucket having an inclosing end 44 and sides 45', the latter formed convergingly from the front to the rear.

I construct a guide-plate 46 having parallel sides 47 25 best shown in Fig. 8 and parallel ends 48 said sides and ends being secured near their lower edges upon parallel blocks 49; and the bucket is rigidly secured upon blocks 49 the latter preferably passing within the upper rim of the bucket, and thereby a movement of guide- 30 plate 46 will control the movement of the bucket.

Upon each side and near the upper edge of guide-plate 46 are secured pairs of adjacently disposed wheels or rollers 50 the upper roller of each pair adapted to have a seating upon the upper edge of swinging tracks 29 and 35 upon tracks 14, the lower roller of each pair having a revoluble seating upon the lower face of said tracks, and, by this construction it will be understood that guide-plate 46 and bucket 45 have a movement in common, lengthwise along these trackways, and may not 40 have a sidewise movement.

For laying water pipe or sewer pipe a vertical excavation must be made and the construction described permits this; posts 9 and 10 must be maintained in a vertical position, and for this purpose each pair of bed- 45 plates 1 must be placed level as compared with each other.

In order that the bucket may be rolled upon trackways 29 and 14 I employ the cables 51 and 52. Cable 50 51 has one of its ends mounted at 53 upon the outer end of the guide-block and passes over the double-pulley 40 and passes to pulley 18. Cable 52 is secured at 54 upon the inner end of the guide-block and extends to the rear of and above tracks 14 to pulley 55 thence upward to pulley 56 and thence forwardly to pulley 57 and downward to pulley 20 and cables 51 and 52 may be under 55 control of any suitable power, as is evident, for causing a lengthwise movement of bucket 45 forward or rearward upon tracks 14 and 29. From the description it will be understood that a trench having vertical walls 60 may be excavated, under operation of the cutting-blade and devices named. It will be remembered that the entire upper framework and mechanism thereon may be readily moved or rolled forward on tracks 3, and for this purpose any convenient means may be employed.

As more particularly described hereafter, it is intended 65 that each upward swing of tracks 29 will cause the knife to engage the soil at the front of the trench, and the framework must be moved forward a few inches at each upward swing of the knife, so that a portion of the soil 70 may be dislodged.

Having described the parts, operation will be readily understood. The parts shown in Fig. 2 are placed upon the course of the proposed trench to be excavated in a manner so that tracks 14 are vertically disposed above 75 the line of the proposed trench, and an excavation has first to be made by use of shovels or other means, sufficient for the bucket to be positioned therein, shown by the dotted lines of Fig. 3.

To operate the parts for performing excavating the cutting blade, under control of cable 39 is raised by a swinging movement of track 29, and will cut into the unexcavated portion 57' (Fig. 3) of the soil, the bucket following closely adjacent and collecting the dislodged parts and being gradually filled. The sewer-pipe having already been laid in the rear part of the excavation, 85 the bucket under control of cable 52 is then propelled upon tracks 29 and 14 in a direction to the rear, and the contents dumped upon the pipe. Any convenient means may be employed for moving the framework forwardly upon trackway 3, a movement of a few inches 90 being required between each time of operating the cutting blade. The bucket under operation of cables 51 and 52 travels substantially the whole length of tracks 29 and 14 as often as filled and dumped, and, as is apparent, the bucket may be dumped where desired at 95 any point along the line of the trackways named.

A trench may be cut any desired depth by an adjustment of trackways 29, and these trackways may be shortened or lengthened by any convenient adjustable means, as by employing the lengthwise incision 58 slots 100 59 and bolts 60. (Figs. 4-5).

What I claim as my invention is,—

1. In excavating and filling mechanism, the combination with a lengthwise-movable frame having a conveying trackway sustained thereon; of a track-portion hingeably 105 connected with one of the ends of the conveying trackway, and having a cutting-blade secured upon its free end; a receptacle adapted to be sustained by the conveying trackway and by the hingeably connected track-portion; means to cause a swinging movement of the hingeably connected track-portion, and means to cause a movement of said receptacle in a direction in alinement with said conveying trackway and said hingeably connected track-portion. 110

2. In combination, mechanism for the purpose described, comprising a pair of adjacently-disposed parallel trackways; a frame; a trackway secured upon said frame; a series of sustaining-platforms lengthwise movable upon each of the adjacently-disposed parallel trackways and having said frame secured thereon; said trackway upon the frame having an oscillatory end-portion with a cutting-blade secured upon its free end; a guide-plate having a receptacle secured thereon and adapted to have a seating upon the trackway upon said frame and upon the oscillatory end-portion of said trackway; means to cause 115 an oscillatory movement of said end-portion of the trackway upon said frame, and means to cause a lengthwise movement of said guide-plate upon the trackway upon said frame and upon the oscillatory end-portion of said trackway. 120 125

3. In combination, mechanism as described, comprising a pair of adjacently-disposed parallel trackways formed as lengthwise-extending separable sections: a frame; a trackway secured upon said frame; a series of sustain- 130

ing-platforms lengthwise movable upon each of the ad-
jacentlly-disposed parallel trackways and having said
frame secured thereon; said trackway upon the frame
having a hinged end-portion with a circular cutting-blade
5 secured upon its free end; a guide-plate having a recep-
tacle secured thereon and adapted to have a seating upon
the trackway upon said frame and upon the hinged end-
portion of said trackway; means to cause a swinging
movement of said hinged end-portion of the trackway
10 upon said frame, and means to cause a lengthwise move-

ment of said guide-plate upon the trackway upon said
frame and upon the hinged end-portion of said trackway.

In testimony whereof he has affixed his signature in
presence of two witnesses.

his

WILLIAM Z. X LAUGHTERBACK.

mark

Witnesses:

JOHN D. COOK,

S. Q. GORDON.