

No. 667,199.

Patented Feb. 5, 1901.

E. F. DYER.  
BEET STORAGE HOUSE.

(Application filed Oct. 24, 1900.)

(No Model.)

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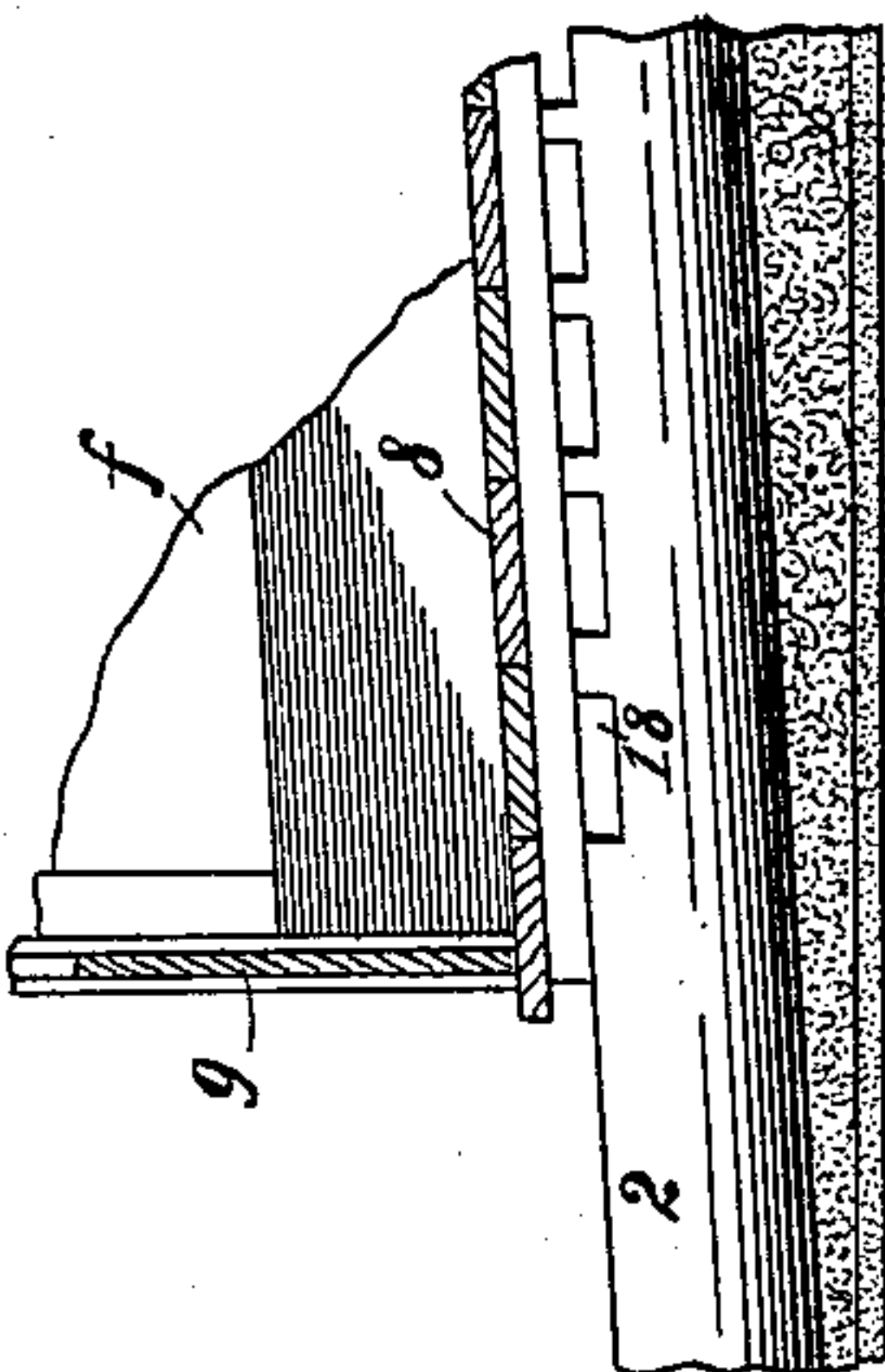
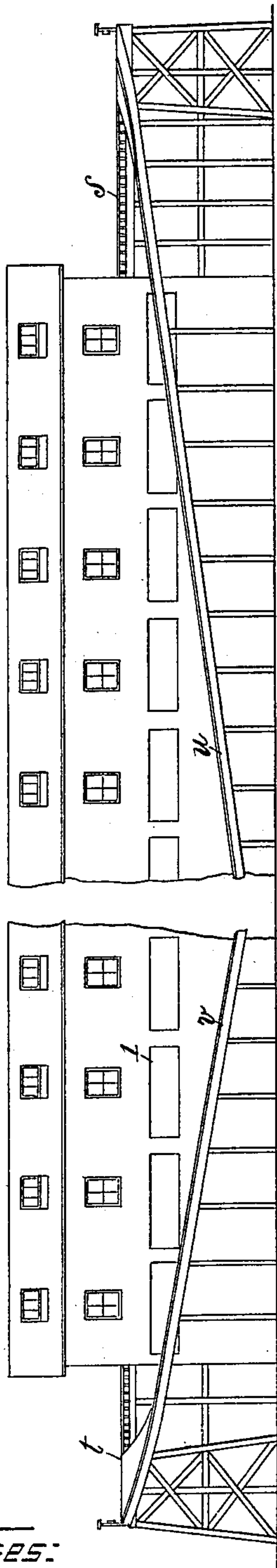


FIG. 1

FIG. 4

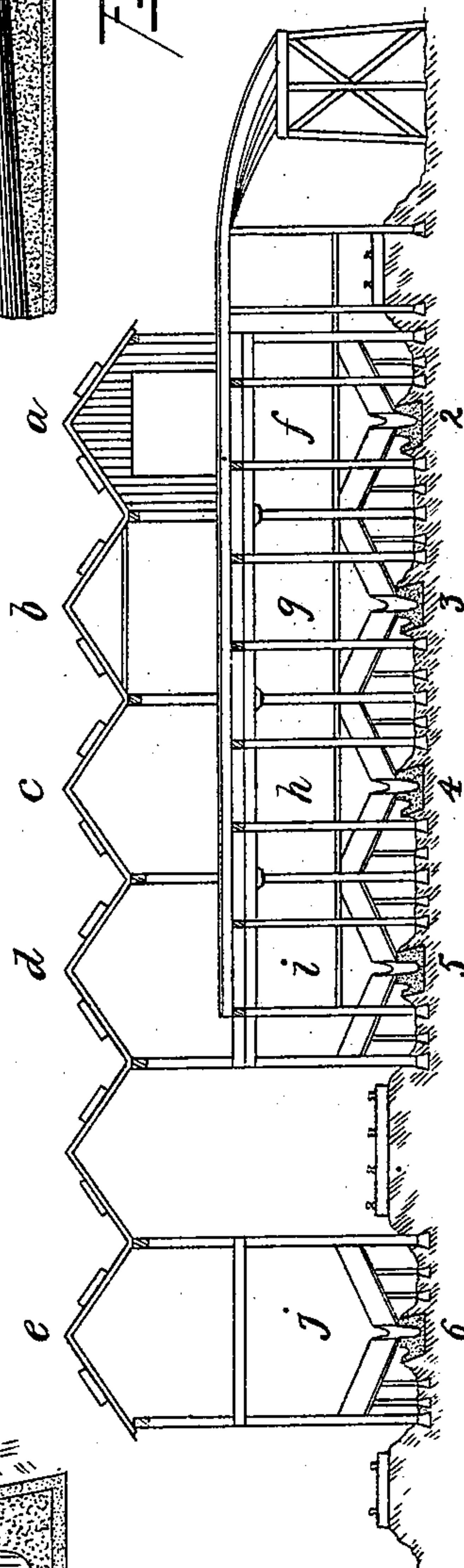


FIG. 2

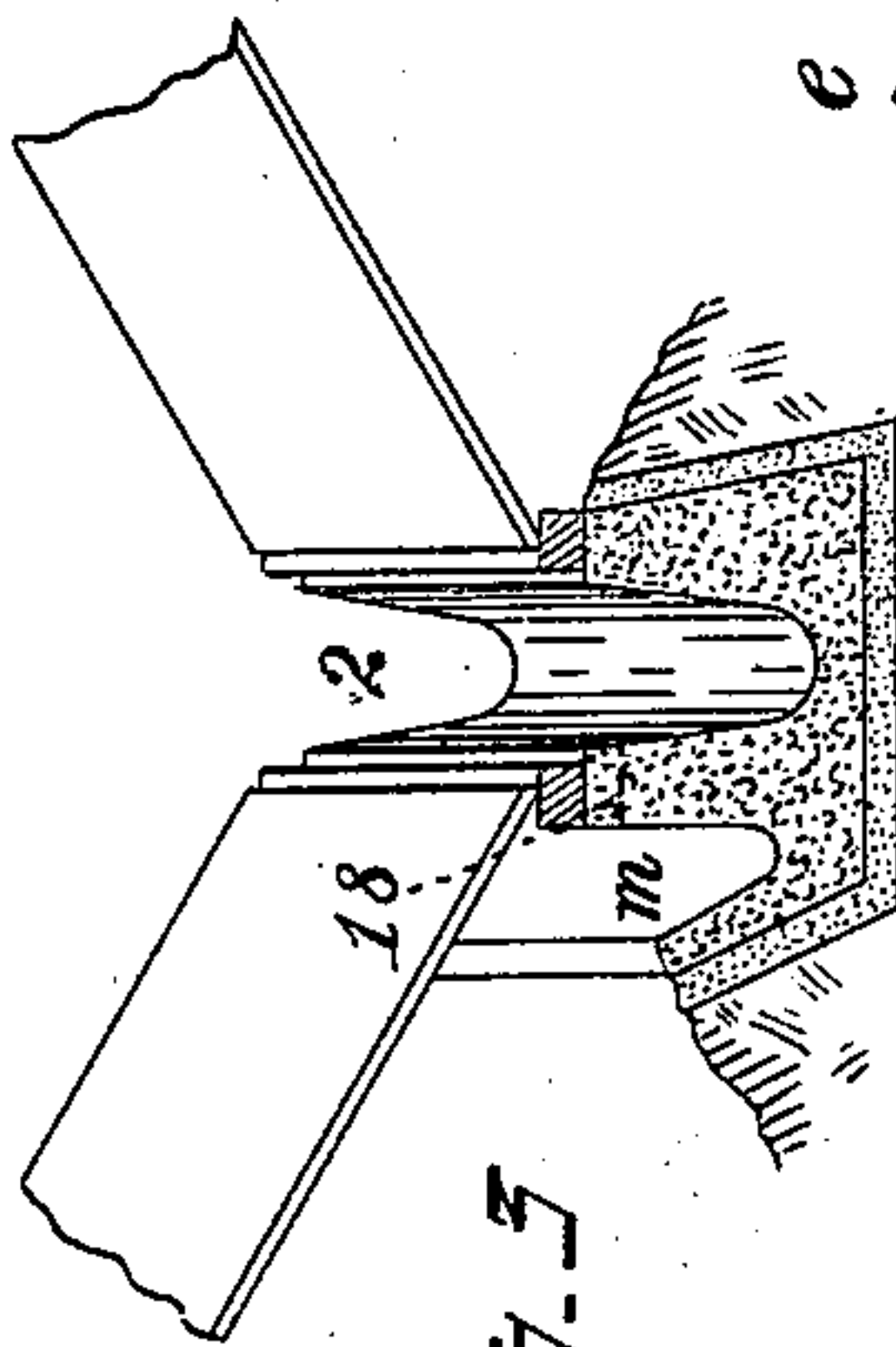


FIG. 3

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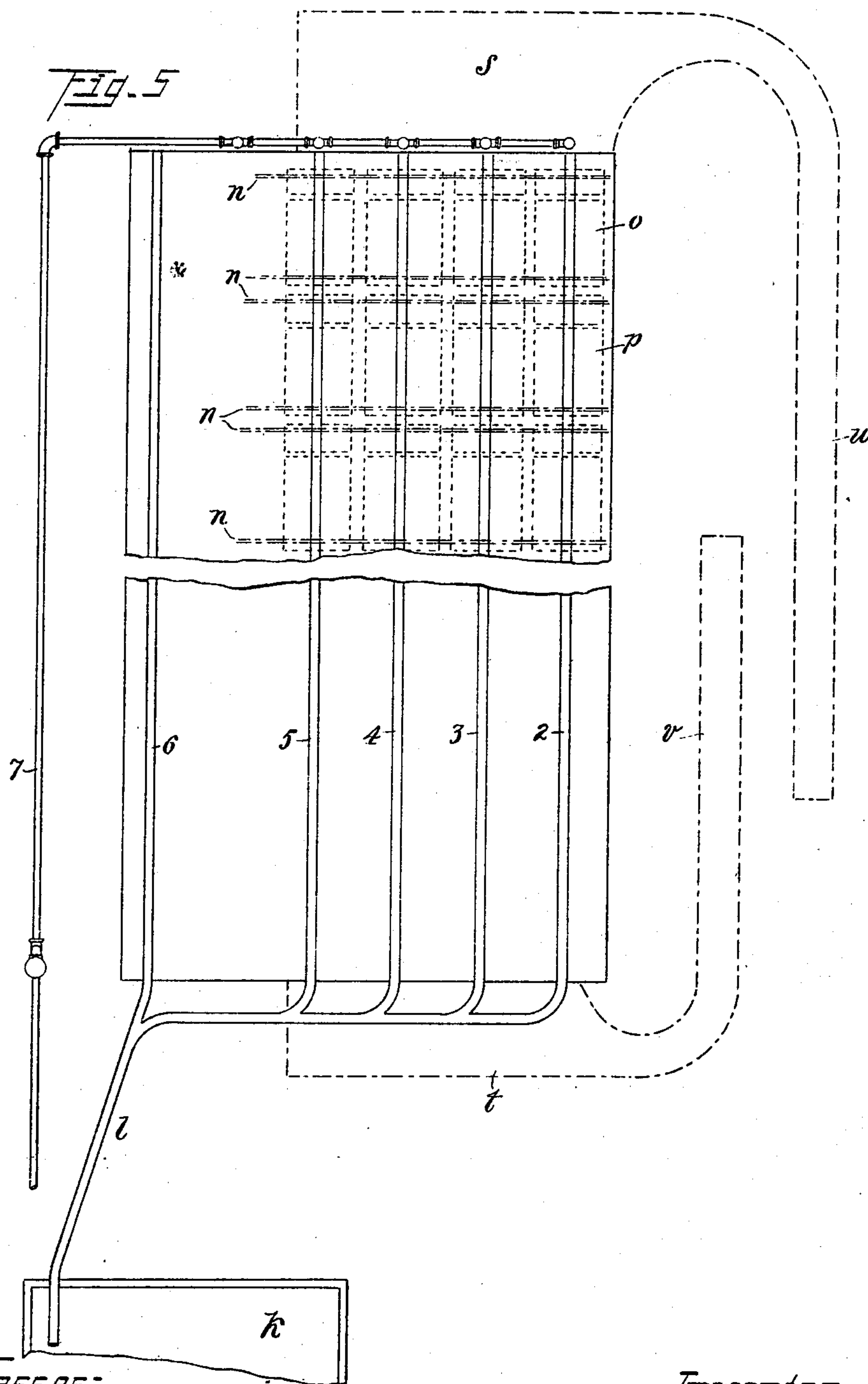
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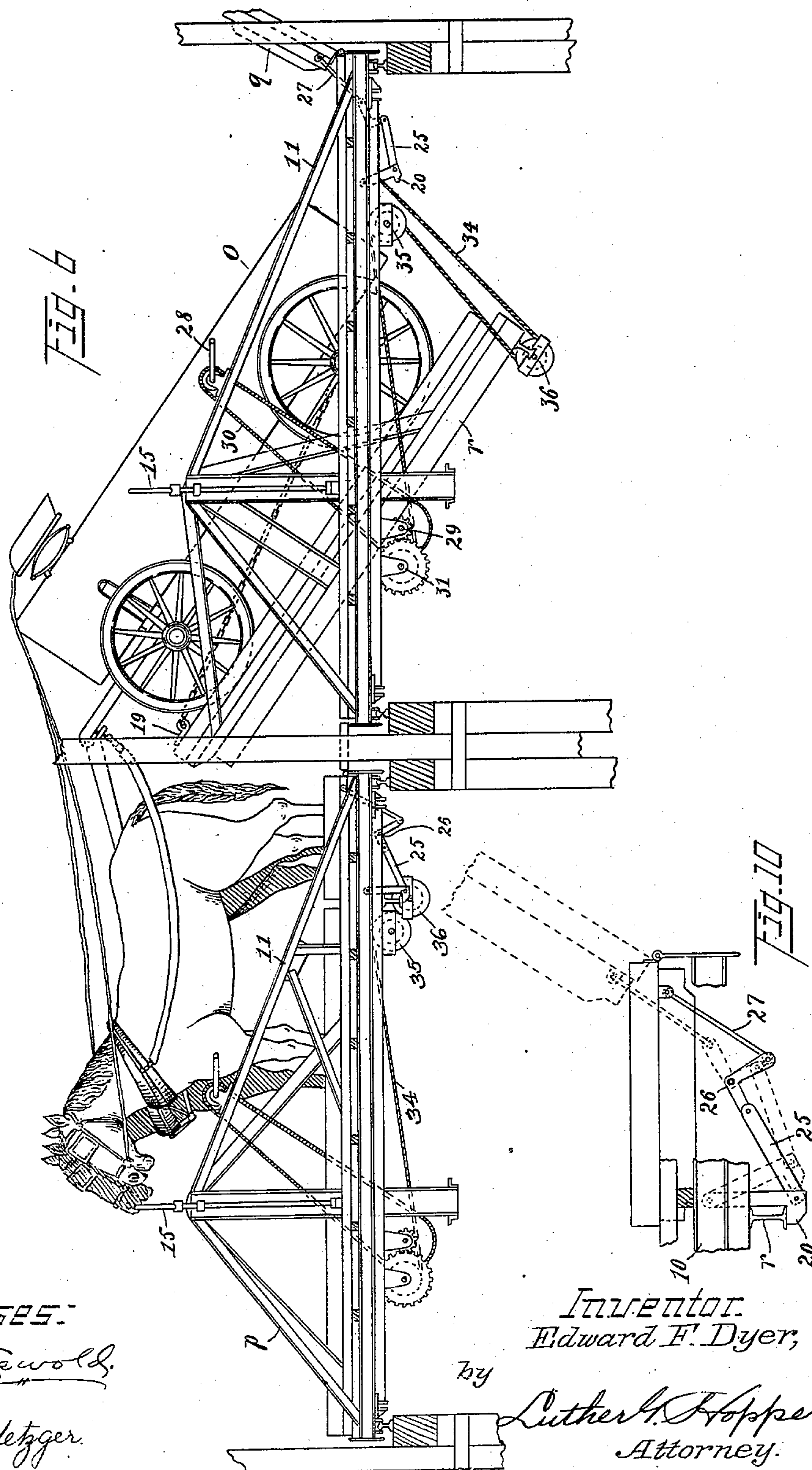
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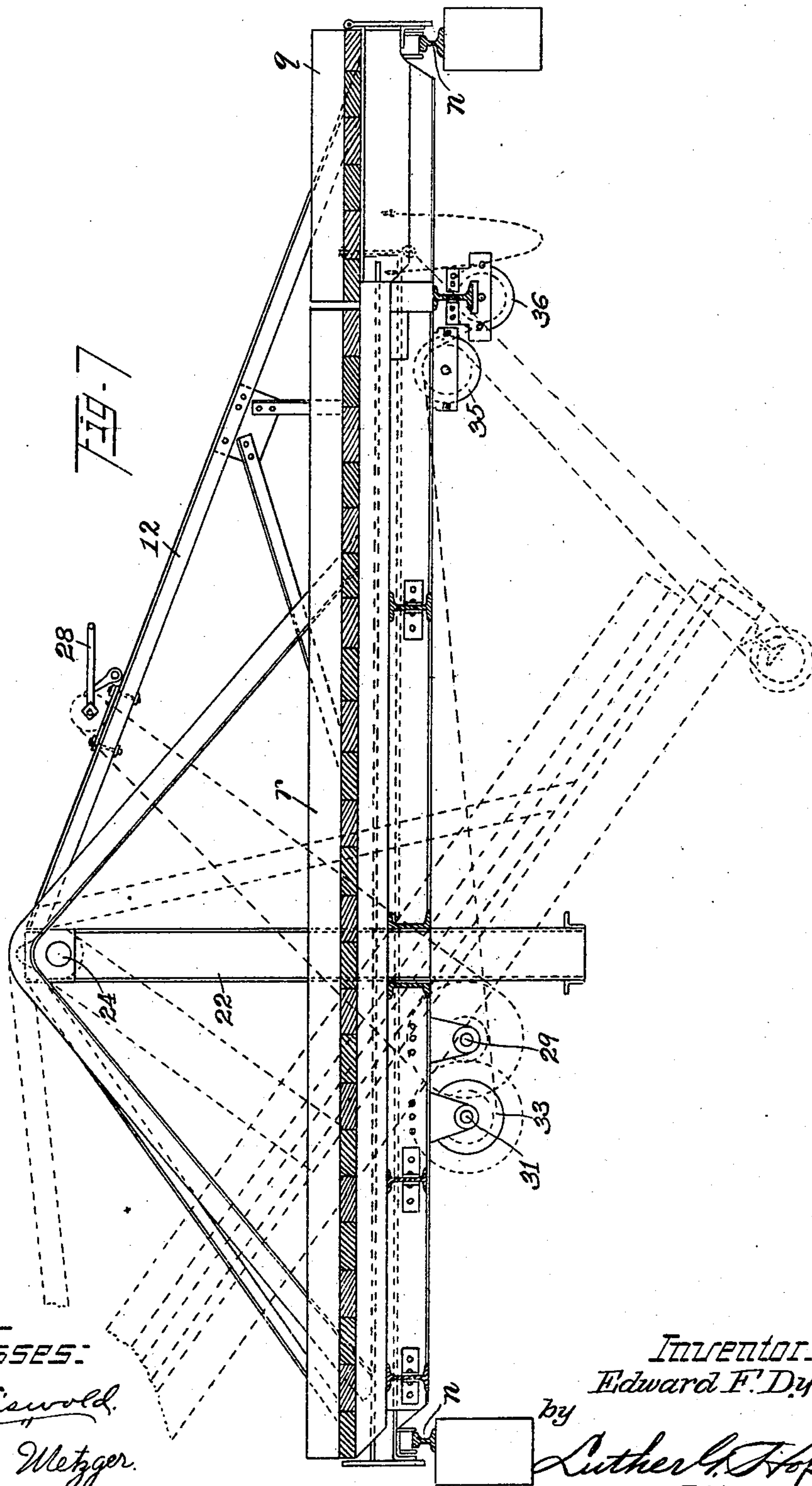
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5 Sheets—Sheet 4.



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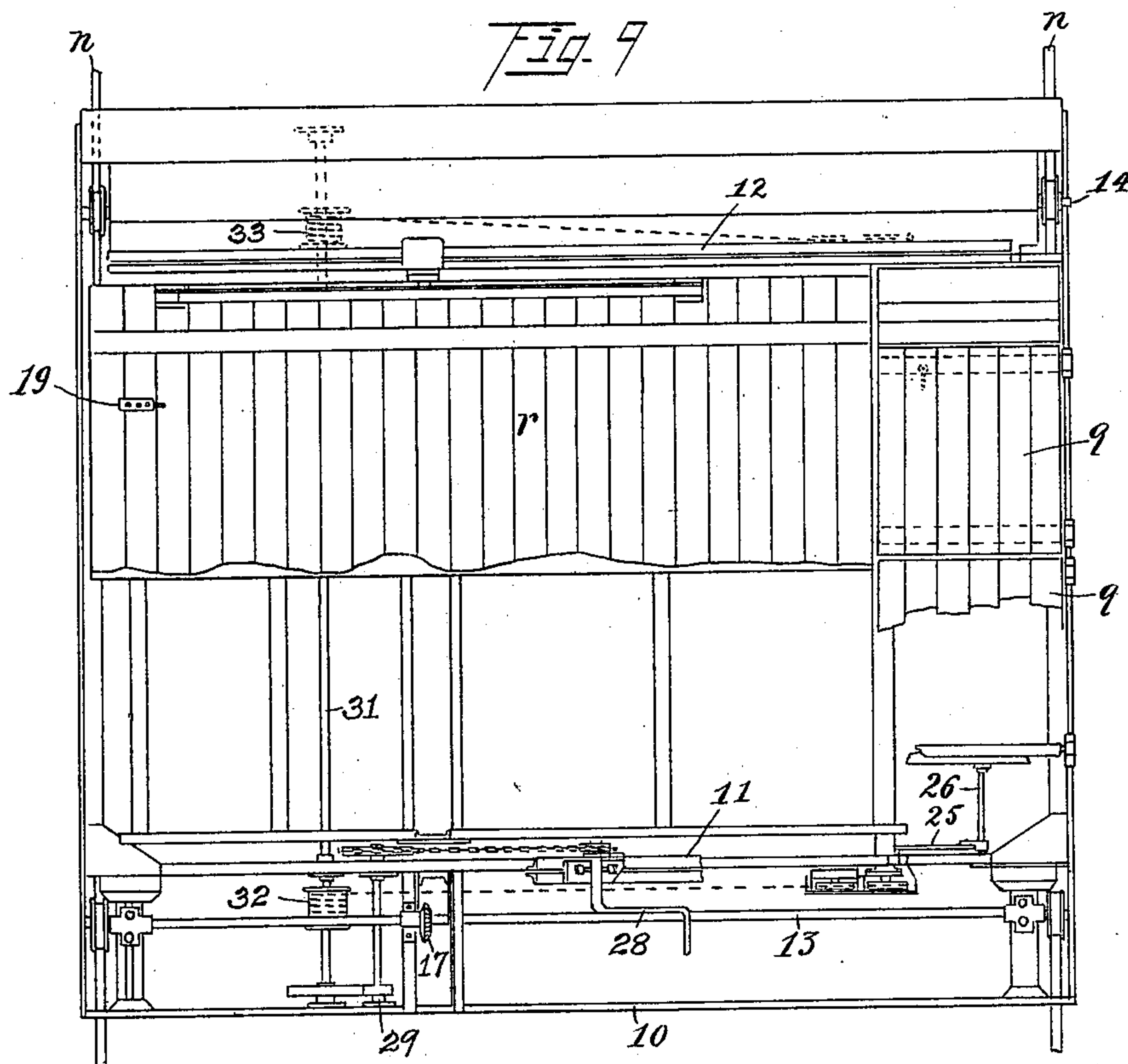
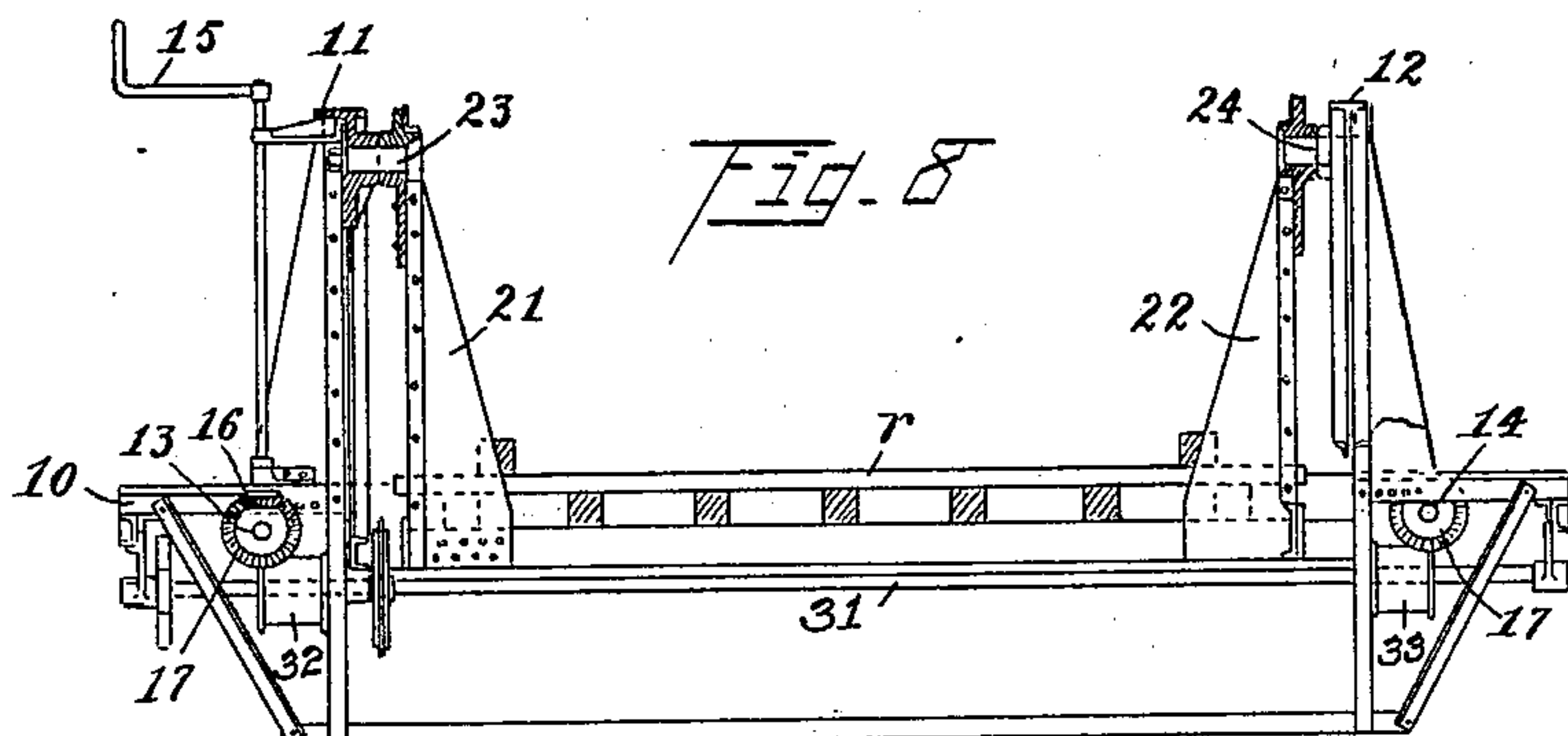
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# UNITED STATES PATENT OFFICE.

EDWARD F. DYER, OF CLEVELAND, OHIO, ASSIGNOR TO E. H. DYER & CO.,  
OF SAME PLACE.

## BEET-STORAGE HOUSE.

SPECIFICATION forming part of Letters Patent No. 667,199, dated February 5, 1901.

Application filed October 24, 1900. Serial No. 34,131. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD F. DYER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Beet-Storage Houses, of which the following is a specification.

This invention relates to beet-houses used in connection with a beet-sugar factory, and has for its object the provision of means for expediting the transfer of sugar-beets from farm-wagons to the bins provided for their temporary storage and means for readily conveying the beets from said bins to the factory at any time and in such quantities as may be required, together with such minor improvements over the apparatus heretofore employed for the purpose as will become apparent from the following detailed description and be set forth in the claims.

It should be borne in mind that where thousands of acres of beets are ripening in the same locality and season of the year it is of great importance to provide means for expeditiously taking care of such enormous quantities of beets at the factory, and as the factory should use the entire crop of beets in about one hundred and twenty days it is also necessary to employ means for supplying the factory from the storage-bins with several hundred tons of beets per day at such times and in such quantities as the progress of the work requires.

To these ends my invention consists in apparatus for dumping beets from the ordinary style of farm-wagon into the storage-bins, in improved means for conveying beets from the storage-houses to the factory, and in features, arrangements, and combinations hereinafter described and claimed, an embodiment thereof being illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the storage-houses for beets, and Fig. 2 is an end view, partly in section, of the same. Fig. 3 is a cross-section, and Fig. 4 is a longitudinal section, of the bottom of a storage-bin, showing the flume. Fig. 5 is a diagrammatic plan of the storage-houses, &c. Fig. 6 is a section

taken longitudinally through a bin, showing the method of dumping beets from a wagon, the dumping-bridges being shown in side elevation. Fig. 7 is a central section of a bridge, taken lengthwise of a bin. Fig. 8 is a section of a bridge, taken crosswise of the bins; and Fig. 9 is a plan view of one of the traveling bridges with part of its floor broken away. Fig. 10 is a side elevation of the trap-door mechanism.

The reference letters *a*, *b*, *c*, and *d* indicate beet-houses, any number of which may be built adjoining each other. The house *e* is intended to receive beets from railroad-cars, and the houses *a* and *d* may also have railroad-tracks alongside, as shown, and doors, such as 1, may be provided through which the beets are received from the cars into the said houses.

Extending the entire length of each house are storage-bins *f*, *g*, *h*, *i*, and *j*, the floors of which are inclined, so that the beets will slide by gravity into the flumes 2, 3, 4, 5, and 6, running, respectively, through the middle of each house. These flumes converge after leaving the beet-houses into a main flume *l*, leading into the factory *k*, Fig. 5, and are each supplied through the pipe 7 with waste water, which is composed principally of condensed steam from the factory, and consequently warm enough to prevent its freezing in the flumes in cold weather. The flumes are built, preferably, of concrete, as shown in Figs. 3 and 4, and are provided with an adjoining and parallel conduit, as at *m*, into which the water overflows through ports 18 in case the current is dammed up from any cause, thus keeping the adjacent soil dry, which is especially important under the beet-houses for the preservation of the beets and also for protection to the foundations of the buildings. Planks 8 are laid across the flumes in the aforesaid storage-bins for the beets to rest upon and are adapted to be lifted out one by one, beginning at the lower end of the bin. When the bins are full of beets, a sliding door 9, as shown in Fig. 4, in the lower end of each bin is first opened, allowing the beets to run into the flume until their weight is taken off of the lower cover-plank sufficiently for it to



be easily removed, after which the cover-planks may be readily removed in succession as required.

In houses such as *a*, *b*, *c*, and *d*, intended to receive beets from wagons, are a number of parallel tracks extending across the entire group of houses, comprising suitable rails *n*, resting upon timbers above the storage-bins. Supported, respectively, upon said tracks and having suitable track-wheels for moving them thereon are movable bridges, as *o* and *p*. These bridges are all alike, each being provided with a tilting platform *r* and trap-doors *q*. Elevated platforms *s* and *t*, level with the floors of said movable bridges, are erected adjacent to the ends of the houses, and an inclined roadway *u* is provided for loaded wagons to ascend to the platform *s*. The said bridges are placed in line with each other, forming a continuous roadway lengthwise of one of the storage-bins, whereupon the wagons enter from the platform *s*, pass over the bridges, stopping where desired to discharge their loads, as will be more fully described herein-after, and emerging upon the platform *t*, from which they descend by the inclined roadway *v*. The bridges *o*, *p*, &c., being similar in all respects, I will now proceed to describe one of them.

A rectangular frame 10, having trusses 11 and 12 across the span on each side, is provided with bearings for axles 13 and 14, having flanged track-wheels at each end adapted to run upon the aforesaid elevated tracks. Cranks 15 for turning bevel-pinions 16, meshing with bevel gear-wheels 17, secured to the axles, as plainly shown in Figs. 8 and 9, are provided for moving the bridge along its track.

The bridges being arranged end to end over one of the bins, a wagon is driven in from the platform *s* over the bridges until it arrives on the bridge above that part of the bin where it is desired to deposit the load of beets. It is then made fast to the tilting platform *r* by chains passed around or hooked to the rear axle, the forward ends of said chains being hooked into the eye-straps 19, as plainly shown in Fig. 6, while the stringers on the platform prevent any lateral shifting of the wagon. The horses attached to the wagon stand upon the next bridge, as shown, and the operation of dumping the load may be performed without removing any of the harness. A pair of hook-shaped lock-arms 20, one on each side of the roadway, fulcrumed to and depending from the frame of the bridge, are adapted to normally hook under the end of the tilting platform *r* and support the rear end of the same, while its forward end rests upon the frame of the bridge. Upon each side of and extending above the platform are vertical beams 21 and 22, suitably braced and trussed thereto, as shown, and journaled at their upper ends upon pins 23 and 24, secured, respectively, to the bridge-trusses 11 and 12. The hooks 20 are each connected at their lower

ends by bars 25 and hinge-joints to arms of shafts 26, journaled in the bridge-frame. The shafts 26 also have arms standing at an angle to the arms aforesaid, connected by the rods 27 and hinge-joints with the respective trap-doors, as plainly shown in Fig. 10. Thus, the tailboard of the wagon being removed and the trap-doors swung up to the position shown by dotted lines in Fig. 10, swinging the hooks 20 from under the tilting platform, the latter swings by gravity on the trunnions 23 and 24 to the position shown in Fig. 6, whereupon the load of beets slides out of the wagon into the bin below. The position of the trap-doors prevents other teams driving through and also serves to guide the beets into the opening. It will be noticed that the fulcrum being located above the platform causes it to swing forward as it tilts, which not only gives a wider opening for the beets to fall through, but also prevents the necessity of disconnecting the wagon in any way from the horses. To return the platform to its horizontal position, a crank 28 is journaled upon the bridge-truss and provided with a ratchet-wheel and pawl and a sprocket-wheel, which revolves another sprocket-wheel on a short shaft 29 through the chain 30. The shaft 29 is geared to a long shaft 31, extending across the bridge, journaled in the frame thereof, and provided with drums 32 and 33 near each end, to each of which a rope or chain 34 is made fast, passing thence around a sheave-wheel 35, journaled to the bridge and forming a bight in which is a sheave-wheel 36, journaled to the end of the tilting platform and having its other end made fast to the bridge, as shown in Figs. 6 and 7. Thus by turning the crank 28 the said ropes are wound upon the drums, shortening the loop in which the sheave 36 runs, thereby raising the rear end of the platform to its original position, and the trap-doors being closed the hooks 20 are forced under the end of the platform. The wagon is then unchained from the platform and driven through the house across the other bridges to the platform *t*, from whence it descends by the inclined roadway *v* to the ground. It is obvious that by this system of unloading a number of wagons may be admitted at the same time and every alternate bridge may be employed for dumping them when the wagons arrive in such numbers as to require great expedition; but the operation of dumping a wagon can be performed so quickly that it will seldom be necessary to use more than one bridge at a time for dumping, beginning at the upper end of a bin and using the bridges in succession as the bin fills with beets. When the bin in the first house is filled, the bridges are all moved across to the next house, and the operation is repeated as long as beets arrive.

Other modes of applying the principles of my invention may be substituted for the modes herein explained. Change may therefore be made in the details of the construc-



tion disclosed provided the principles of the system set forth, respectively, in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a storage-house of the class described, the combination of a plurality of bins ranged side by side each having a flume thereunder and means for discharging their contents into said flumes, and a series of traveling bridges adapted to be moved crosswise above said bins and each provided with means for dumping the load of a wagon into the bin over which said bridge is placed, substantially as set forth.

2. In a beet-storage house, the combination with a plurality of bins ranged side by side, of a flume under each bin provided with removable covers for feeding beets therein, a series of parallel tracks running crosswise of and above said bins, bridges supported respectively upon said tracks adapted to be moved thereon, and each having a tilting platform provided with means for dumping the load of a wagon driven thereon into the bin over which the respective bridge is placed, substantially as set forth.

3. In a storage-house of the class described, the combination of a plurality of bins ranged side by side having flumes thereunder and means for discharging their contents into said flumes, suitable roadways for the entrance of wagons to the house above said bins and for their egress therefrom, movable bridges capable of being placed end to end forming a continuous roadway over the entire length of a bin and adapted to be moved across from one bin to another, and means in each of said bridges for dumping the load from a wagon driven thereon into the bin below the respective bridge, substantially as set forth.

4. In a storage-house of the class described, the combination with a plurality of bins ranged side by side, and suitable means for filling said bins, of a flume running lengthwise under each bin and means for supplying said flumes with water, inclined floors in said bins sloping downward to the flumes, removable covers over said flumes, and a sliding door in the downstream side of each bin through which the contents of the end of such bin may be discharged into its respective flume, substantially as set forth.

5. In a storage-house of the class described, the combination with a plurality of bins ranged side by side, and suitable means for filling said bins, of a flume running lengthwise under each bin and means for supplying said flumes with water, a conduit adjacent to and adapted to receive the overflow from each flume, inclined floors in said bins sloping downward to the flumes, and removable covers over said flumes, substantially as set forth.

6. In a storage-house of the class described, the combination with a plurality of bins ranged side by side, of a series of parallel tracks running crosswise of and supported

above said bins, bridges respectively adapted to rest upon and be moved along each of said tracks, a swinging floor hinged to each bridge, mechanism for swinging and locking said floors, and means for attaching wagons to the respective swinging floors, substantially as set forth.

7. In a storage-house of the class described, the combination with a plurality of bins ranged side by side, and a series of parallel tracks running crosswise above said bins, of a bridge adapted to rest upon and be moved along either of said tracks, a floor suspended from suitable bearings in the trusses of said bridge, mechanism for swinging said floor, means for attaching a wagon thereto, and trap-doors forming part of the floor of said bridge provided with mechanism for releasing and locking said suspended floor according as said doors are opened or closed, substantially as set forth.

8. In a storage-house of the class described, the combination with a plurality of bins ranged side by side, and a series of parallel tracks running crosswise above said bins, of bridges similar in all respects adapted to rest upon and be moved along the respective tracks, each of said bridges having means for dumping the contents of a wagon out of the rear end thereof into the bin below without disconnecting the horses from said wagon, comprising a floor suspended from fulcrums in the trusses of said bridge, means for swinging said floor and for holding a wagon thereon, trap-doors adjacent to the rear end of said floor, and mechanism for locking and releasing said floor operated by said doors, substantially as set forth.

9. In a storage-house such as described, the combination with storage-bins and crosswise tracks supported above them, of a bridge resting upon and provided with means for moving it along one of said tracks having a floor comprising a platform suspended from fulcrums located upon each side above said platform adapting it to swing forward and upward by gravity, and trap-doors hinged to the bridge in the rear of said platform, means for returning said platform to a horizontal position, lock-arms fulcrumed to the bridge adapted to support the said platform, and mechanism through which the lock-arms release said platform by swinging said doors upward and lock it in its normal position by closing said doors, substantially as set forth.

10. The combination with a movable bridge, of a floor comprising a platform suspended from fulcrums located upon each side above said platform adapting it to swing forward as its rear end is depressed by gravity, and trap-doors hinged to the bridge in the rear of said platform, means for returning said platform to a horizontal position, lock-arms fulcrumed to the bridge adapted to support the rear end of said platform, shafts journaled in the frame of the bridge each provided with two arms standing approximately at right angles to each



other, and connecting-rods respectively between the lock-arms and the shorter arms of said shaft, and between the trap-doors and the longer arms of said shaft, substantially  
5 as set forth.

11. The combination with a movable bridge, of a floor comprising a platform suspended from fulcrums located upon each side above said platform adapting it to swing forward as  
10 its rear end is depressed, and trap-doors hinged to the bridge in the rear of said platform, mechanism for locking and releasing said platform operated by said doors, means for returning said platform to a horizontal position comprising a shaft extending across and jour-  
15 naled to the bridge, carrying a drum near

each end operated by a suitable winch, cables attached respectively to said drums passing over sheave-wheels journaled to the bridge-frame with their rear ends fastened to the  
20 bridge thereby forming depending bights, and sheave-wheels journaled to the rear end of said platform working in the respective bights of said cables, substantially as set forth.

In testimony whereof I affix my signature, 25  
in the presence of two subscribing witnesses,  
at Cleveland, Ohio, October 22, 1900.

EDWARD F. DYER.

Witnesses:

HERMINE ROOT,  
E. C. CLARKSON.