

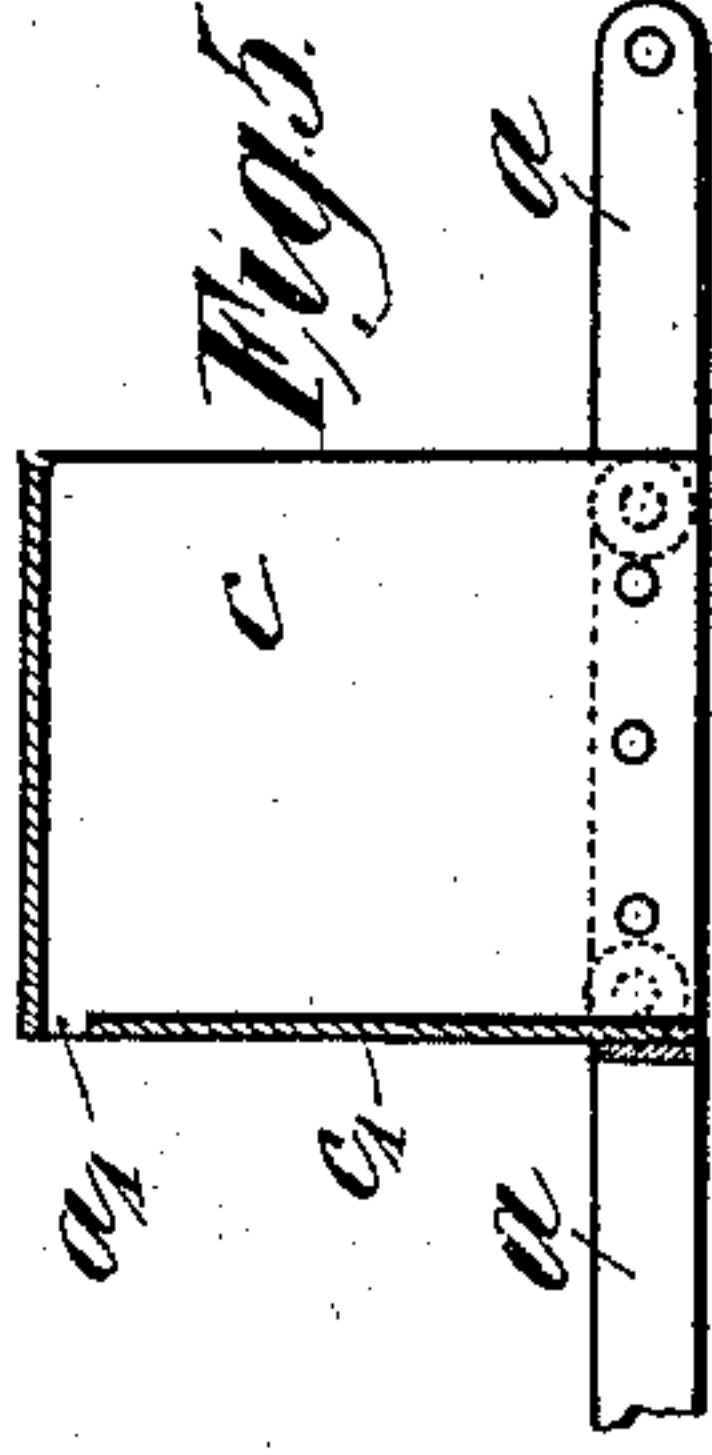
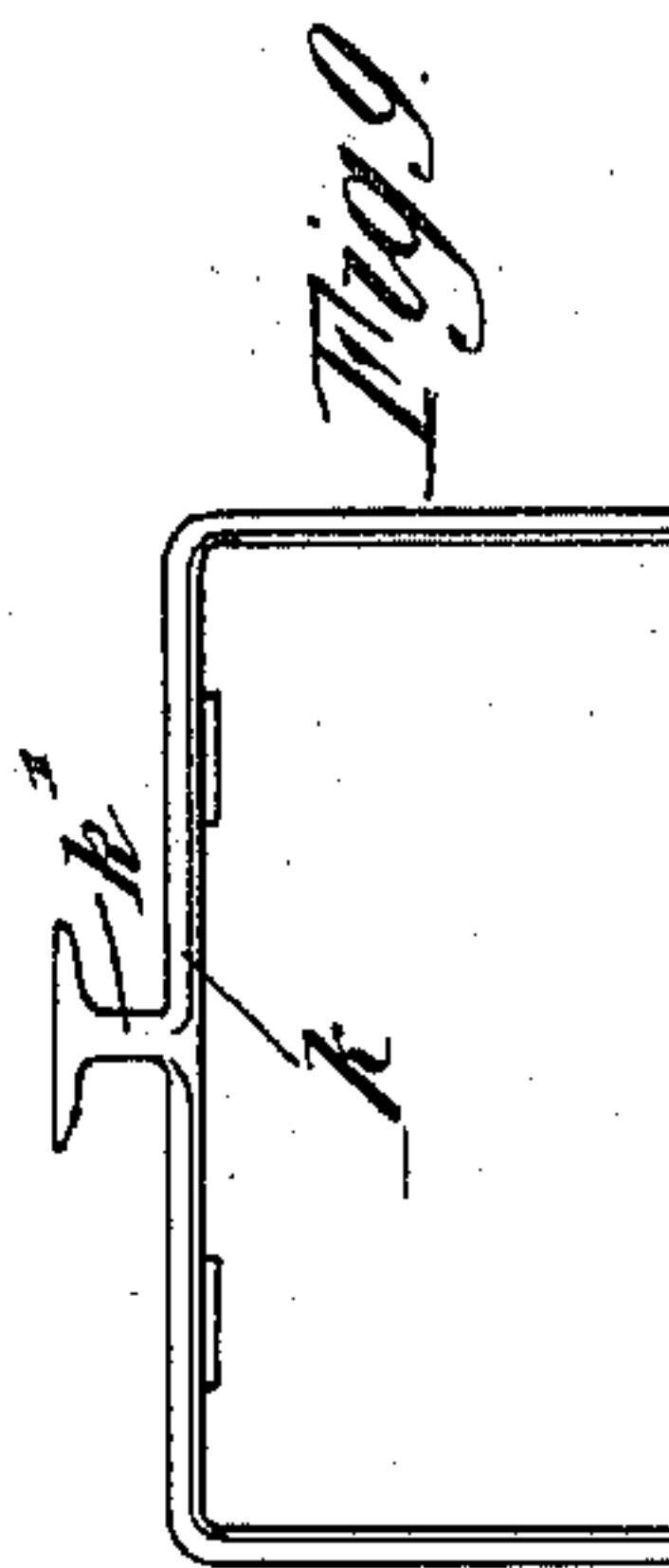
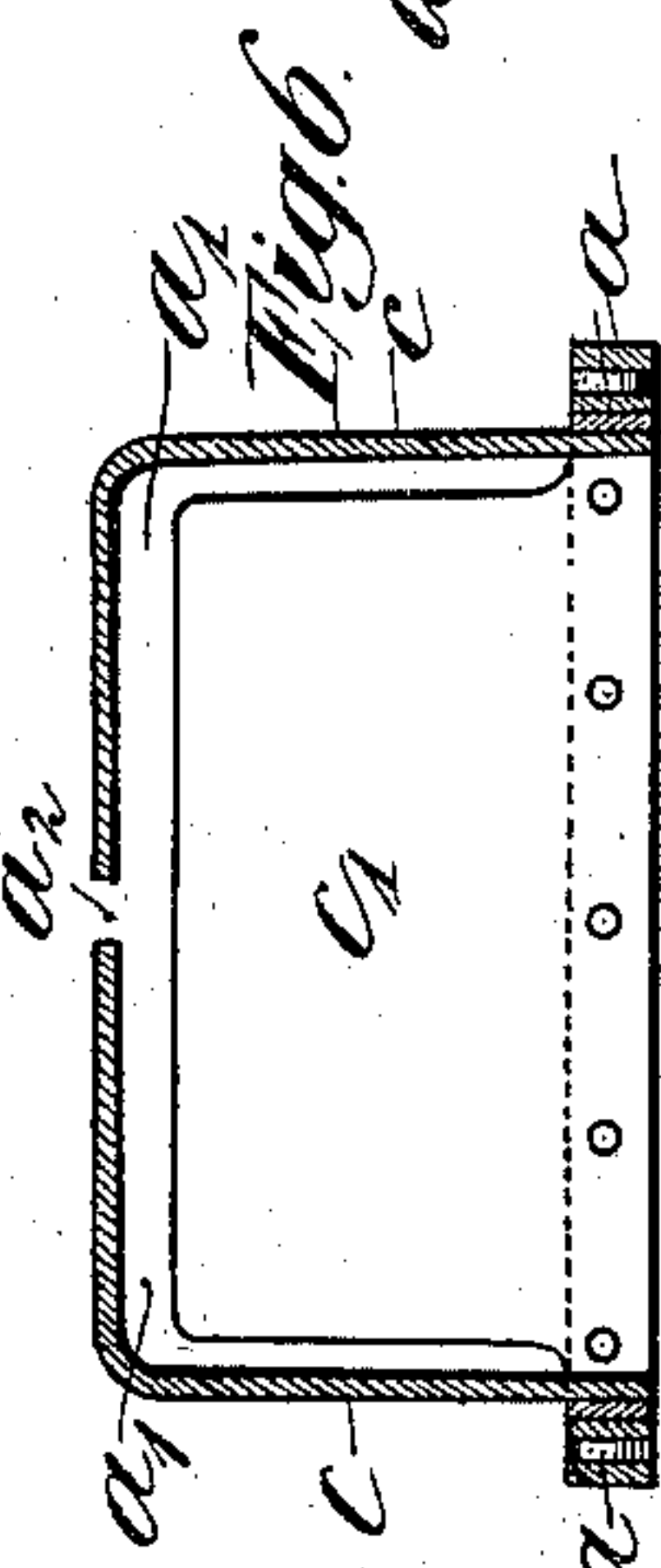
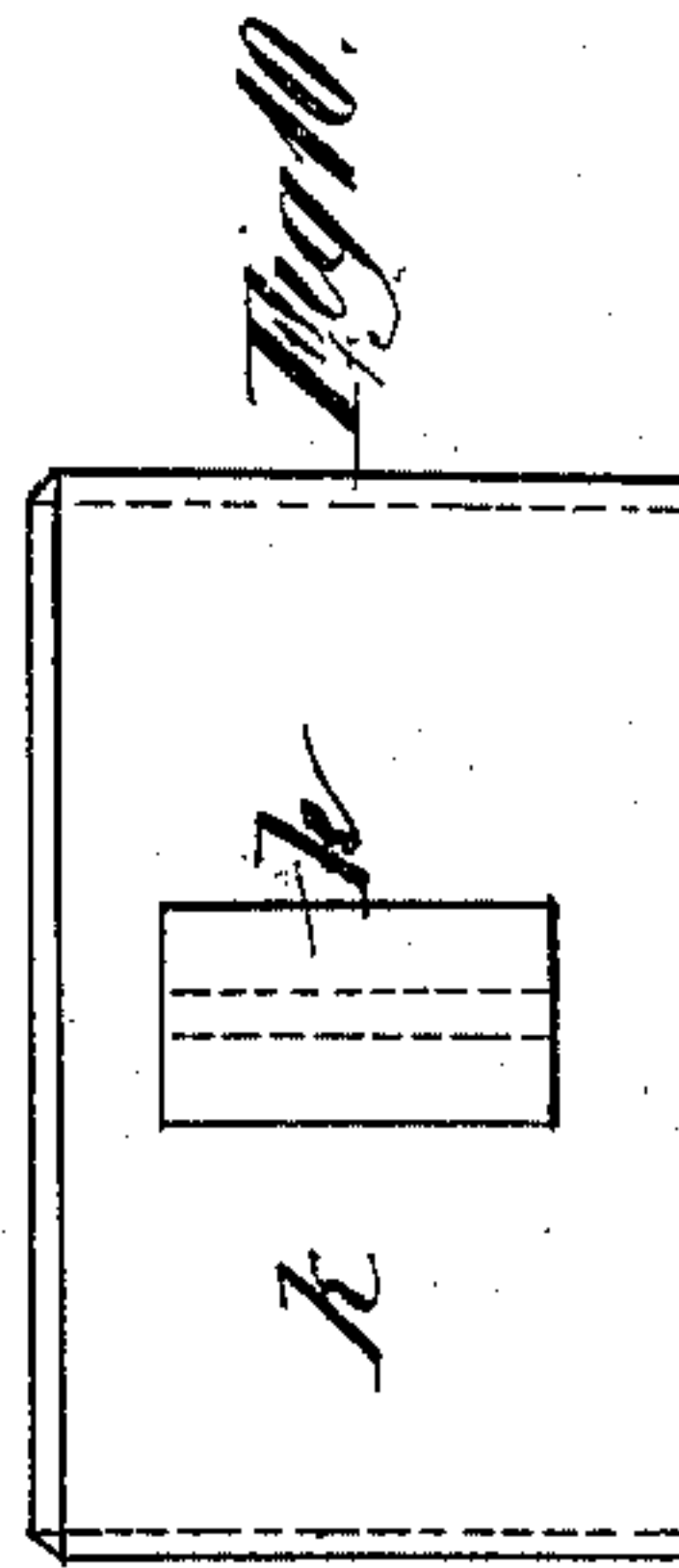
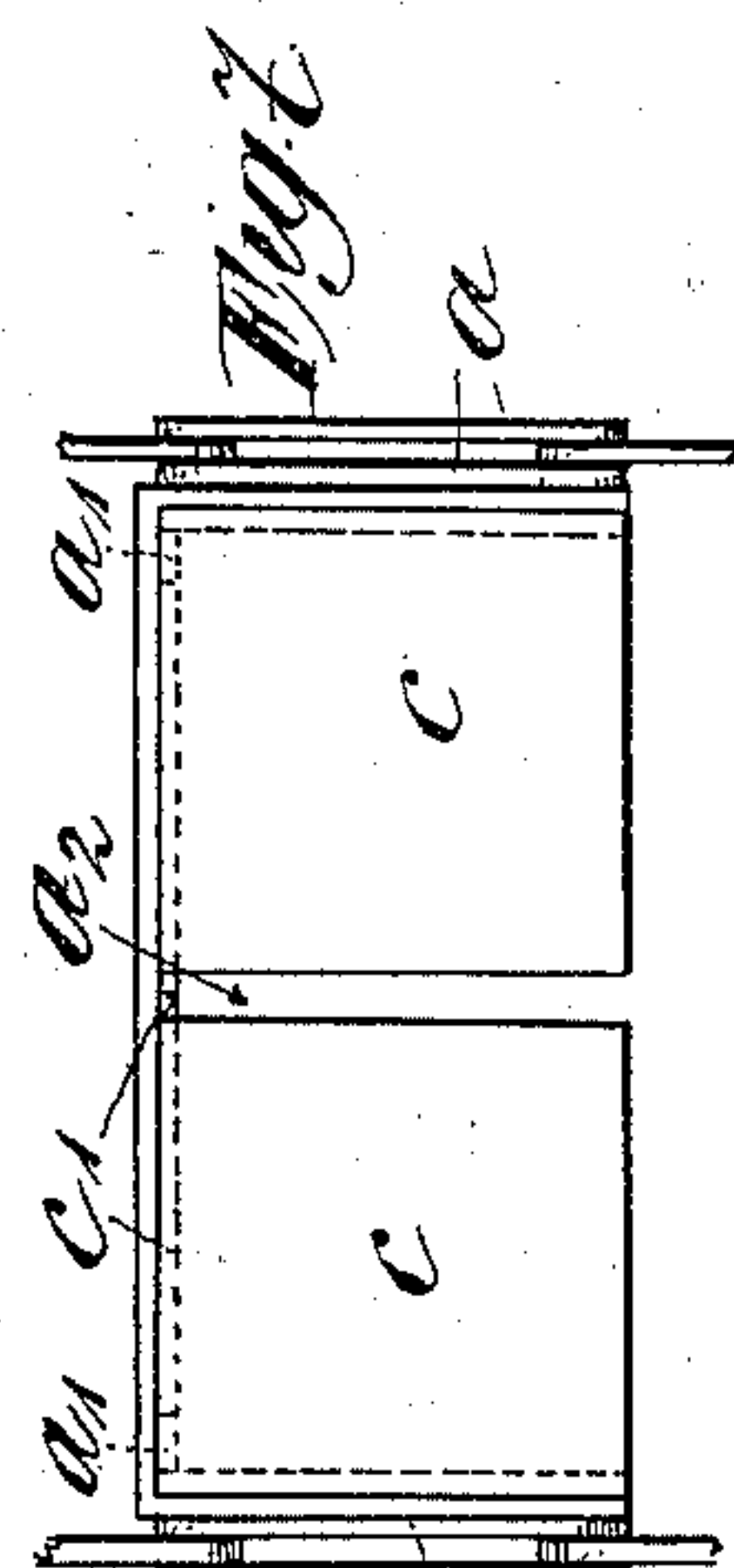
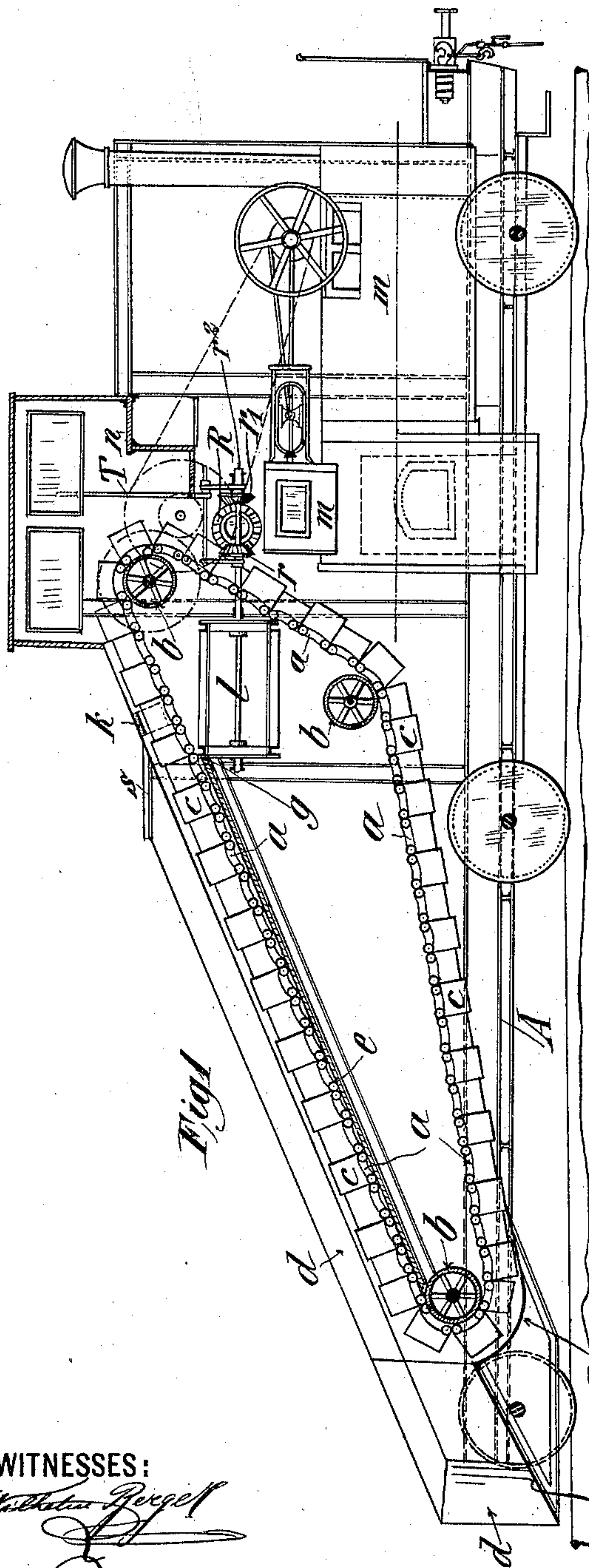
(No Model.)

3 Sheets—Sheet 1.

W. PAULITSCHKE.  
EXCAVATING MACHINE.

No. 598,680.

Patented Feb. 8, 1898.



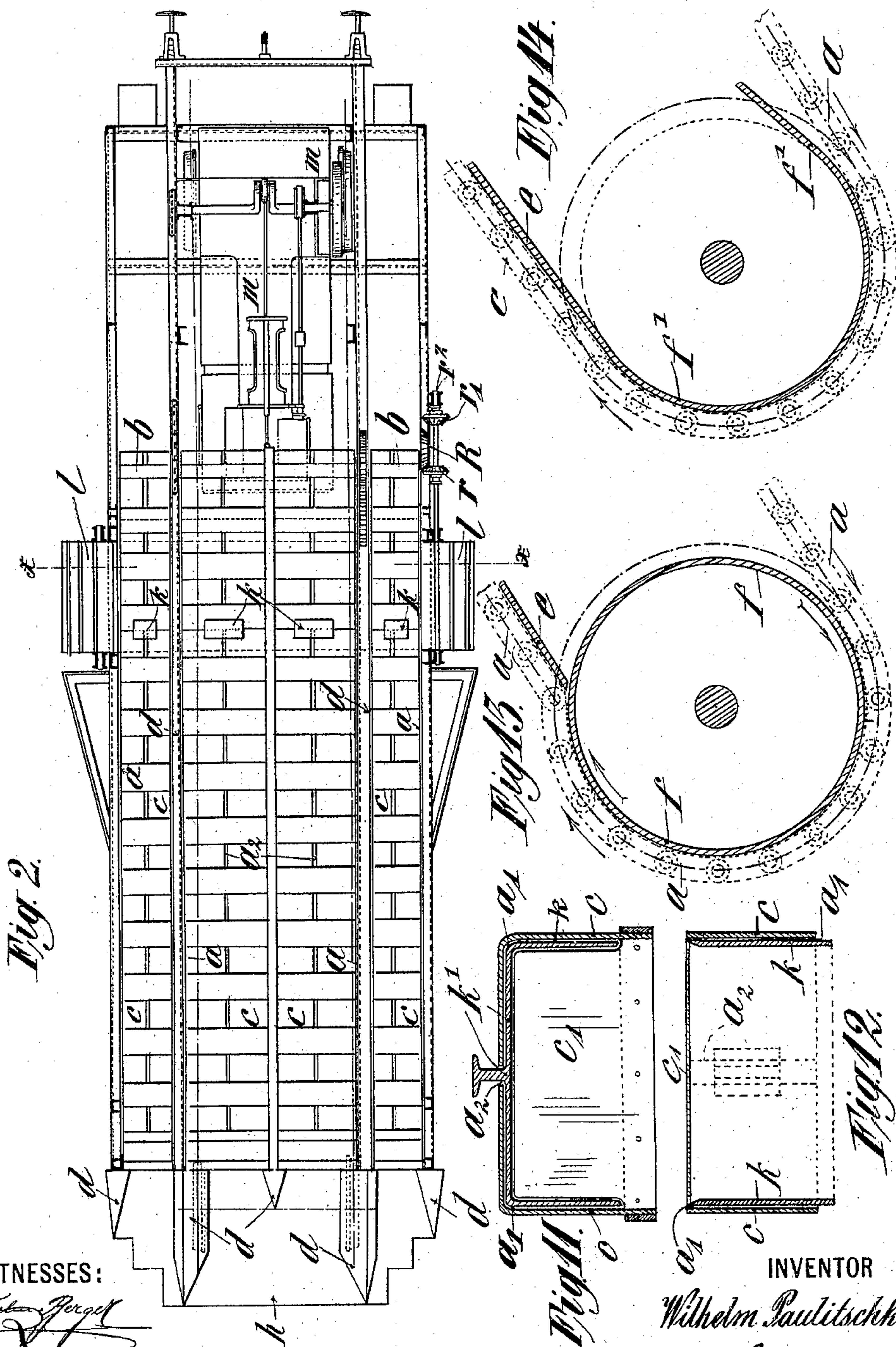
(No Model.)

3 Sheets—Sheet 2.

W. PAULITSCHKE.  
EXCAVATING MACHINE.

No. 598,680.

Patented Feb. 8, 1898.



WITNESSES:

*Wilhelm Perget*  
*Otto Sauer*

INVENTOR

*Wilhelm Paulitschke*

BY

*Lothar Raegner*  
- ATTORNEYS.



(No Model.)

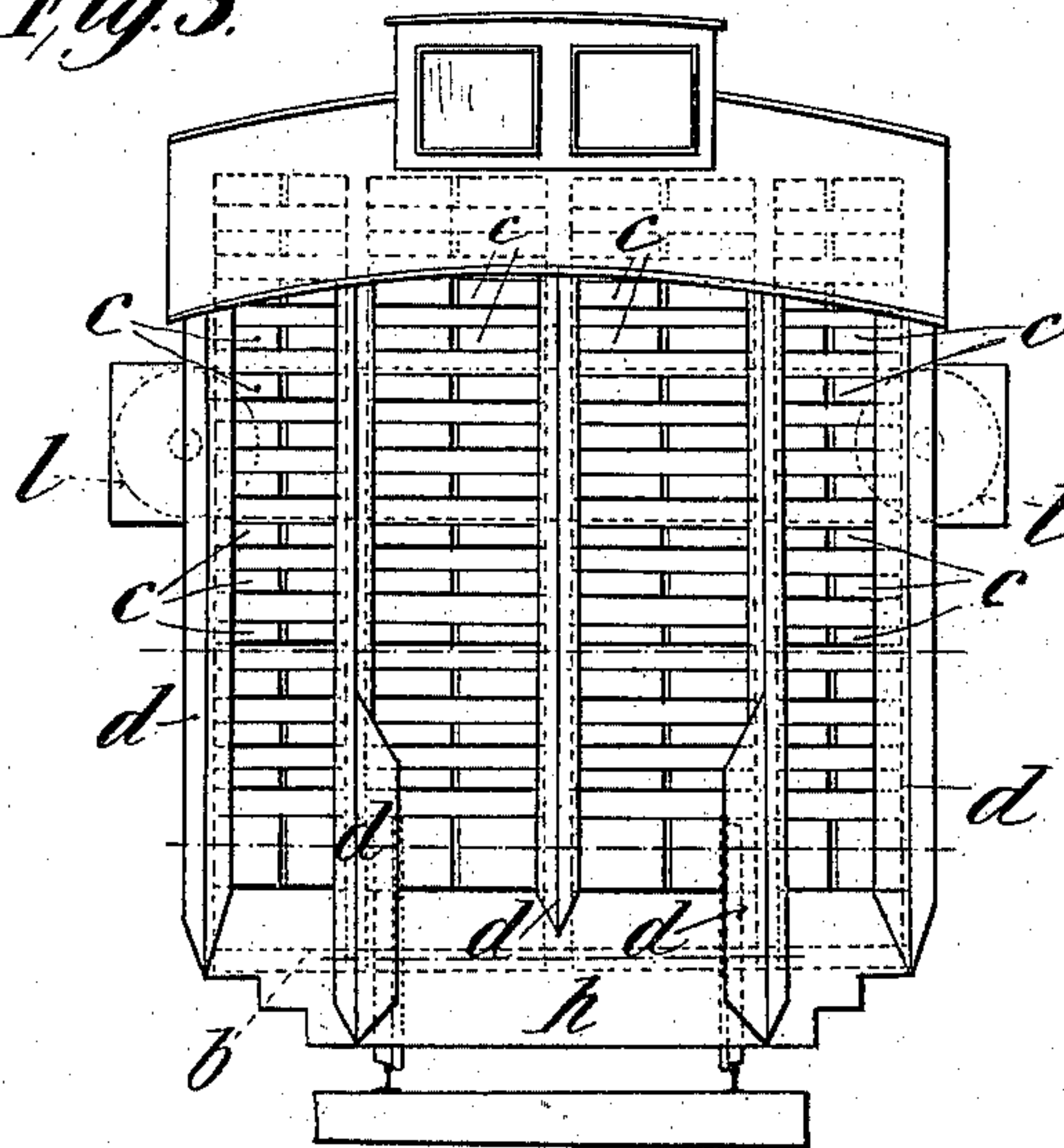
3 Sheets—Sheet 3.

W. PAULITSCHKE.  
EXCAVATING MACHINE.

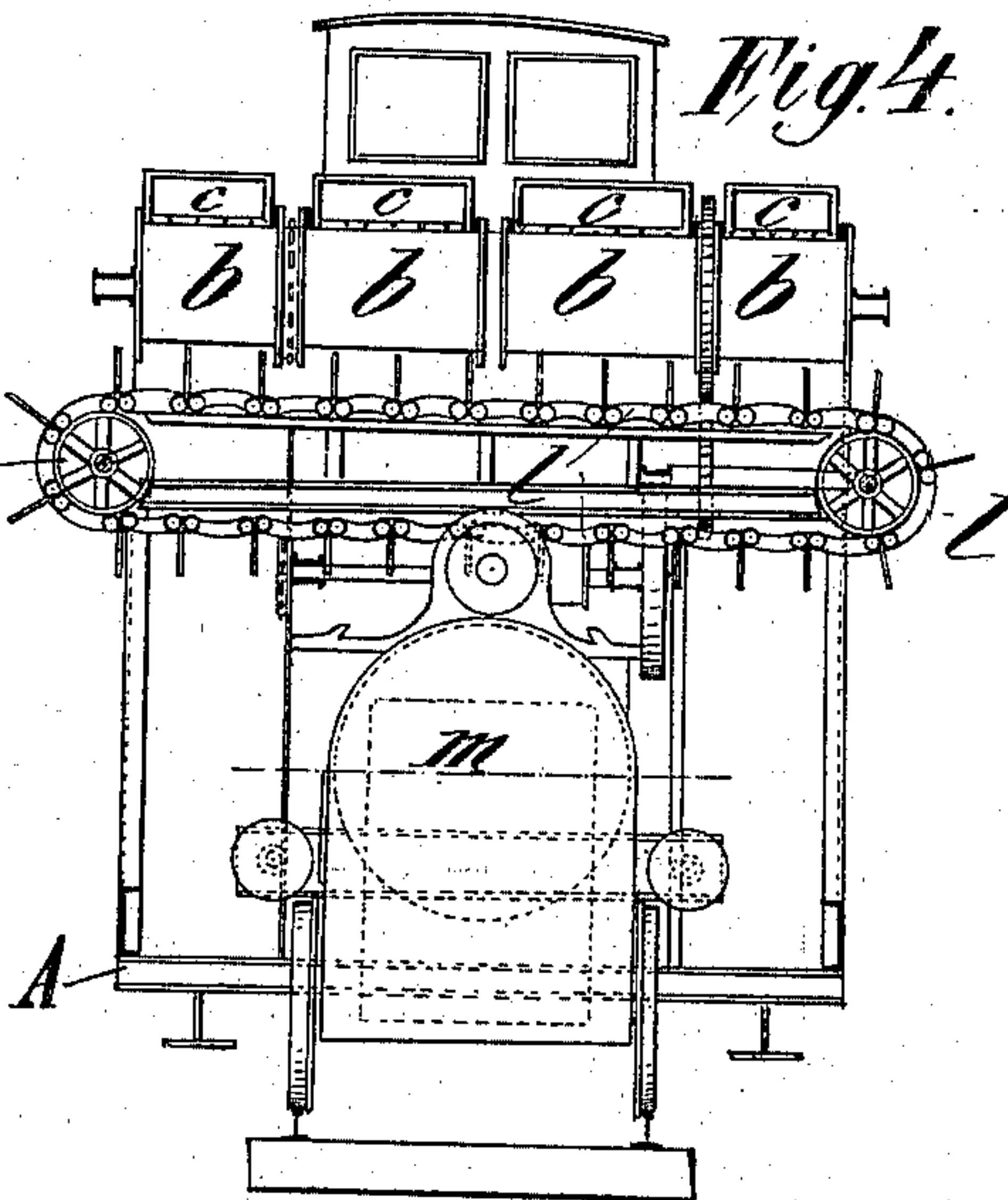
No. 598,680.

Patented Feb. 8, 1898.

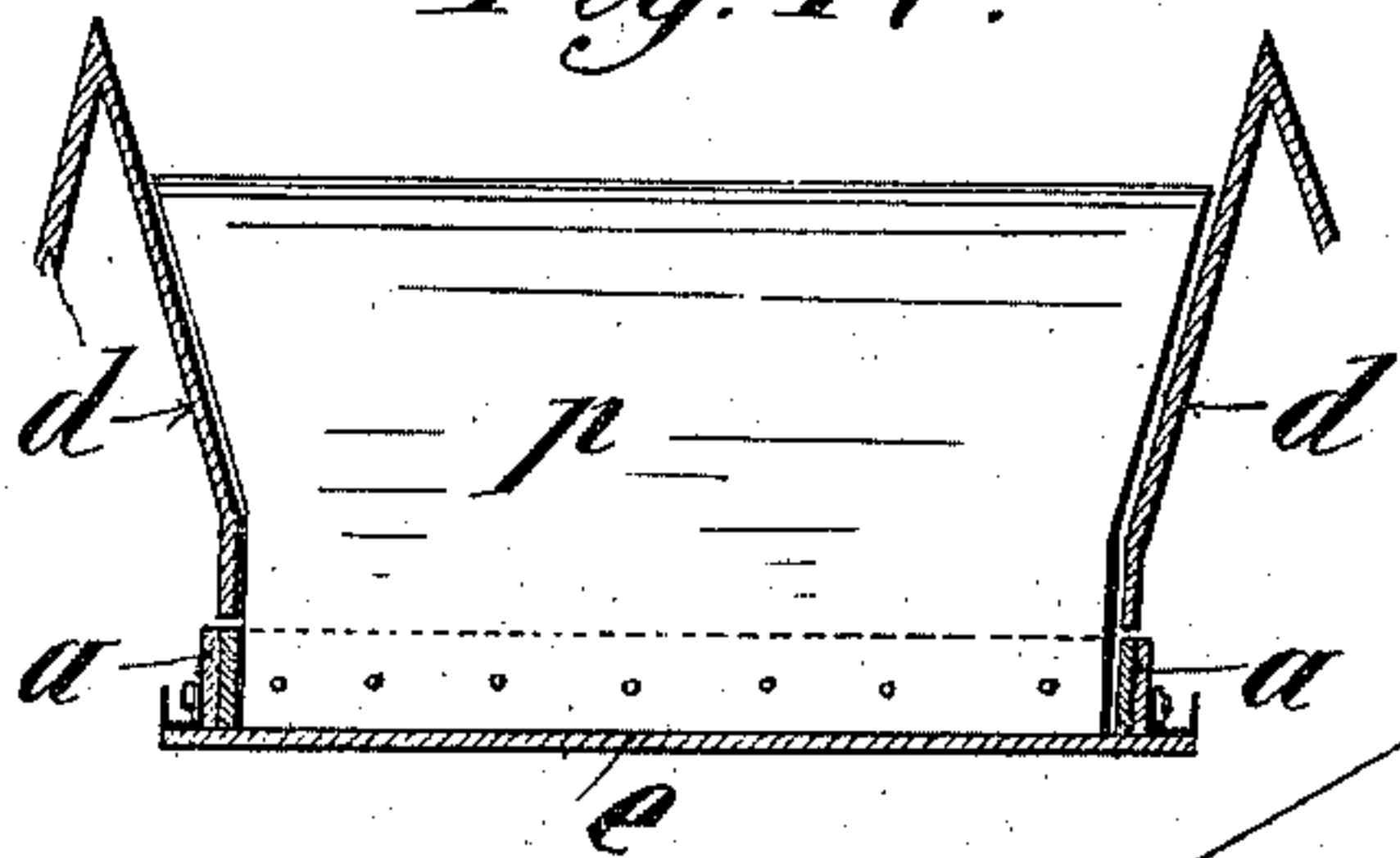
*Fig. 3.*



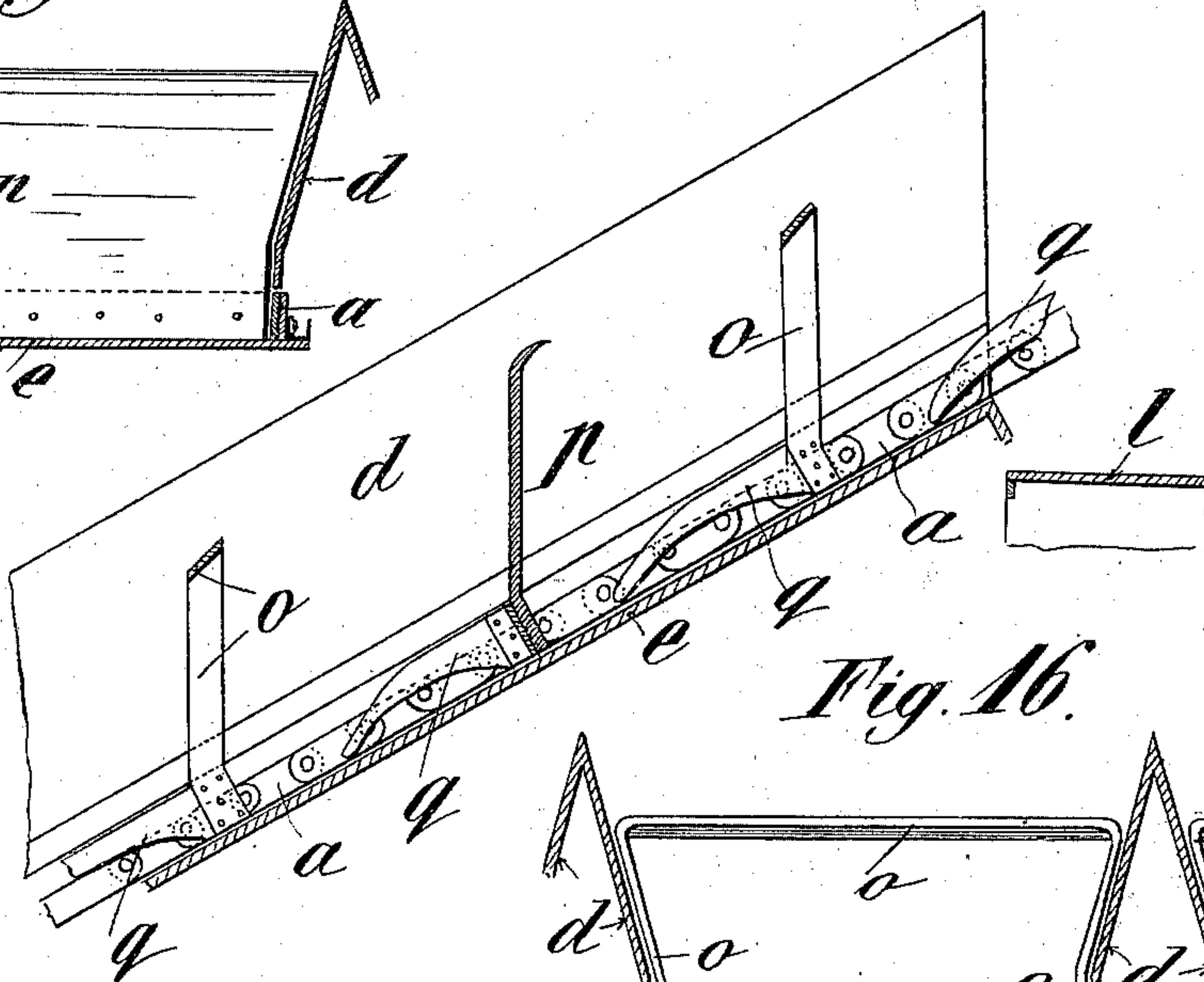
*Fig. 4.*



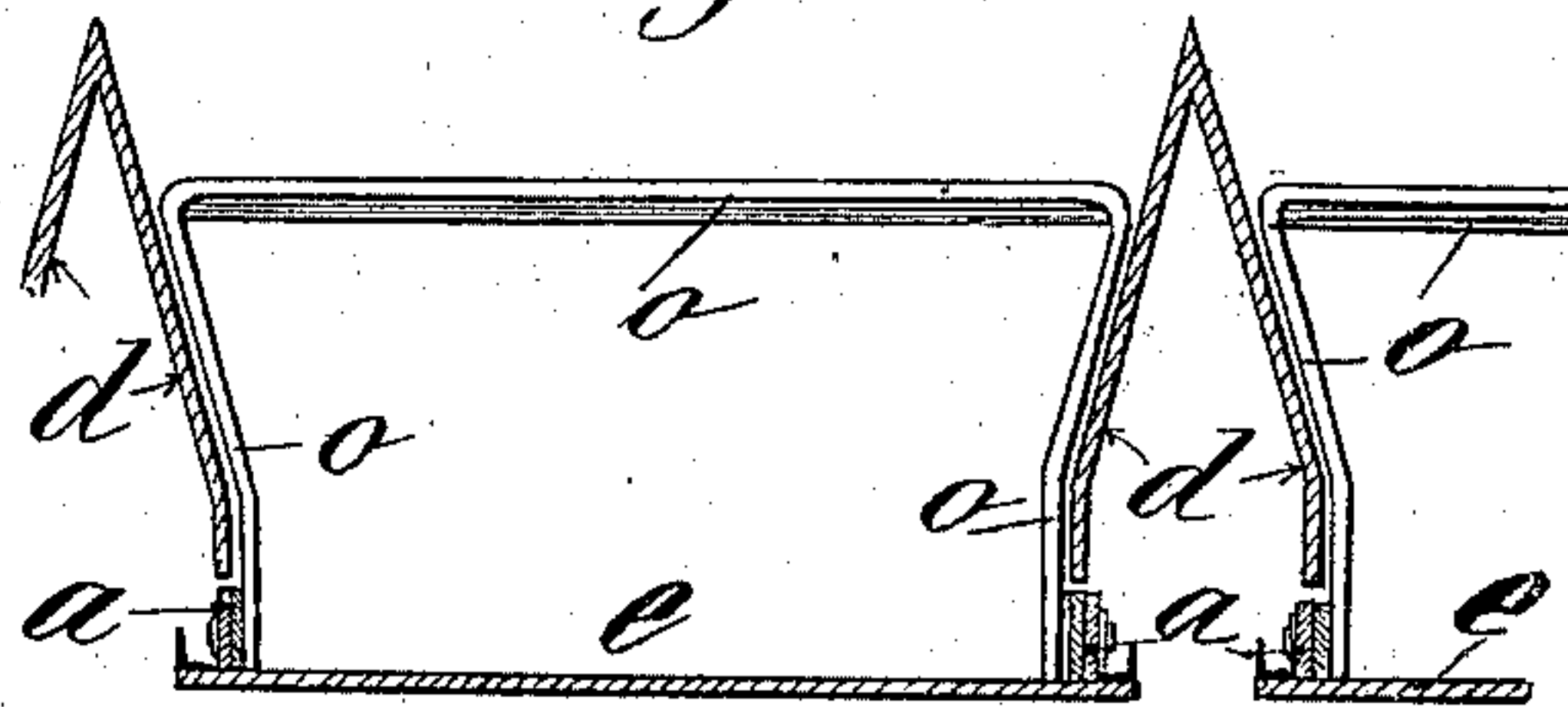
*Fig. 17.*



*Fig. 15.*



*Fig. 16.*



WITNESSES:

*Wilhelm Jorgensen*  
*Otto Pilsner*

INVENTOR

*Wilhelm Paulitschke*  
BY *George Raegen*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

WILHELM PAULITSCHKE, OF MOEDLING, AUSTRIA-HUNGARY.

## EXCAVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 598,680, dated February 8, 1898.

Application filed May 7, 1897. Serial No. 635,478. (No model.) Patented in Germany March 20, 1896, No. 91,545; in Austria March 30, 1896, No. 46/1,264; in Hungary September 30, 1896, No. 5,862, and in France November 11, 1896, No. 261,175.

*To all whom it may concern:*

Be it known that I, WILHELM PAULITSCHKE, a subject of the Emperor of Austria, residing at Moedling, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Excavating-Machines, (for which I have received Letters Patent in Austria, dated March 30, 1896, No. 46/1,264; in Hungary, dated September 30, 1896, No. 5,862; in Germany, dated March 20, 1896, No. 91,545, and in France, dated November 11, 1896, No. 261,175,) of which the following is a specification.

This invention relates to that class of excavating-machines designed for the removal of large quantities of snow on railway-tracks or other roads and for removing sand, grain, &c.

The invention consists of a frame carried by a steam-locomotive or other motor vehicle, guide-rollers mounted on said frame, endless elevator-chains guided over said rollers and provided with a series of buckets, a snow-plow arranged in front of said elevator-chains, dividers extending from the plow upwardly along an inclined plane over which the upper portions of the series of chains pass, said dividers extending between the adjacent chains, and a transverse conveyer which is arranged at the upper part of the endless elevator-chains for delivering the snow, sand, &c., to one side of the excavator, as will be hereinafter described, and then particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a steam-locomotive, showing my improved excavator applied thereto. Fig. 2 is a plan view of the same, parts being removed. Fig. 3 is a front elevation of the same. Fig. 4 is a rear elevation. Figs. 5, 6, and 7 are respectively a vertical transverse section, a longitudinal section, and a top view, of one of the elevator-buckets. Figs. 8, 9, and 10 are respectively a vertical transverse section, and front and top views, of the cutter which coöperates with each bucket. Figs. 11 and 12 are vertical transverse and horizontal transverse sections of a coöperating bucket and cutter. Figs. 13 and 14 show different forms of a drum or guide casing which is arranged at the front end of the inclined plane.

Figs. 15, 16, and 17 are longitudinal and transverse sections of a modified form of elevator mechanism.

Similar letters of reference indicate corresponding parts.

A indicates the frame of the excavator, which is provided with three pairs of rollers *b*, over which are trained several endless elevator-chains *a*, (four being shown in the drawings,) said elevator-chains being arranged in parallel series, so that a number of separate elevating-surfaces are formed.

*c* represents the buckets or shovels, which are connected to the links of the elevator-chains, their particular construction being more especially shown in Figs. 5, 6, and 7. The buckets are of a scoop or hood shape and are open at their front and lower sides, while the rear wall *c'* is separated from the three adjacent side walls by means of a U-shaped slot *a'*, so that by means of said slot said rear wall *c'* is formed into a springy or yielding blade. Extending transversely of the upper or top wall of each of the buckets is a slot *a''*, arranged at the mid-length of said top wall. These buckets are arranged at suitable intervals apart and, together with the chains which carry them, are guided over an inclined plane *e*, which is supported on the frame *A* in any suitable manner, said inclined plane extending from a point quite adjacent to the front guide-rollers, over which the chains pass upwardly to a point *g*, which is a short distance from the upper series of guide-rollers *b*, so that an opening or space is formed between the inclined plane and the rear guide-rollers.

In juxtaposition to the upper guiding-rollers *b* and at points above *g* are mounted a number of snow-cutters *k*, one for each elevator-chain. Said cutters each have such form that they may pass through the said slots *a'* *a''* of the buckets. To this end the said cutters *k* are formed as particularly shown in Figs. 8, 9, and 10, in which it will be seen that they are of U shape, having at their front edge a beveled or cutting portion, while they are formed intermediately of their lengths with T-shaped shanks *k'*. The U-shaped part of the cutter *k* passes through the U-shaped slot *a'* of the bucket *c*, while the shank *k'* passes through the slot *a''* of the



bucket. The specific manner in which the buckets and cutters cooperate and the relative sizes and arrangements of the same are more particularly shown in Figs. 11 and 12.

5 Mounted on the inclined plane *e* and extending parallel with each other to points in advance of said inclined plane are a series of dividers or separator-boards *d*, said dividers being arranged between the adjacent eleva-  
10 tor-chains.

The lower open sides of the buckets *c*, when they reach the front part of the excavator, slide over either a rotary drum or a cylinder *f*, as shown in Fig. 13, or over a fixed drum  
15 *f'*, which merges from the inclined plane, as shown in Fig. 14, said open lower sides of the buckets also sliding over the inclined plane *e* as the same are carried upwardly and to the rear of the excavator.

20 Arranged in front of the drum or cylinder *f* and under the upwardly-projecting ends of the dividers *d* and terminating coextensively with said dividers is a small snow-plow *h*, to the rear of which is provided a trough *i*, which  
25 is filled with any suitable liquid, preferably salt water, into which the forward lower portions of the elevator-chains dip as the same are carried around, so that the ice formed on the same is thawed out or dissolved.

30 Arranged below the rear opening formed at the upper end of the inclined plane *e* is an endless conveyer *l*, which extends transversely of the excavator the whole breadth of the same and to points slightly beyond each side  
35 of the same. The direction of movement of this endless conveyer may be altered through the medium of bevel gear-wheels *r r'*, which are arranged on the drive-shaft *r<sup>2</sup>* of the endless conveyer, said gear-wheels being adapted  
40 to be alternately engaged, by means of a suitable shifting device *T*, with the driving gear-wheel *R*, arranged intermediately of said gear-wheels *r r'*. The rotation of the shaft carrying the power-transmitting gear-wheel  
45 *R* is accomplished through the medium of a steam-locomotive *m* or any other suitable motor vehicle, which is provided with a seat *n*, on which the engineer sits, so that he may overlook the track in front of the excavator  
50 and control the driving mechanism.

In Figs. 15, 16, and 17 a modification of the elevator mechanism is shown. Here the walls of the buckets are narrow, forming, as it were, snow-breaking cutters *o*, whereas the rear  
55 walls of the buckets, so to speak, are formed by means of shovels or blades which, together with the cutters *o*, are provided with tail-pieces *q* for holding the same effectively in operative position by engaging with the in-  
60 clined plane *e*, over which the endless chains *a* are guided. The side walls of the dividers *d* are so narrow that they form between them and above the inclined plane *e* a series of transporting-channels in which the cutters *o*  
65 and the shovels *p* come into full working operation for the purpose of carrying the snow or sand up along said inclined plane.

The apparatus is operated as follows: When the engineer or driver causes the engine to travel in forward direction along a snow-im- 70 peded track, the snow is plowed up by the snow-plow, divided by the dividers *d*, and deflected upon the endless elevator-chains. The buckets *c* or the cutters *o*, in connection with the shovels *p*, as the case may be, loosen 75 and pick up the snow and lift the same on the inclined plane *e*. The adherence of the snow, &c., to the inclined plane is prevented by reason of the springy nature of the blades *p* or the rear walls *c'* of the buckets *c*, which 80 rear walls form springy blades. When the snow arrives at the point *d*, they slide one after the other past the snow-cutters *k*, whereby the portions of snow in the buckets are cut out in the form of blocks and separated from the lateral and upper walls of the 85 buckets. The springy rear walls or blades *C'* of the buckets are somewhat retained or deflected by the action of the cutters *a*, but as soon as the buckets pass the latter they 90 spring forward and the snow is caused to drop out of the buckets and fall down upon the endless conveyer *l*. By means of the endless conveyer the snow is transported to either side of the excavator and falls down at the 95 side of the track or onto transporting-cars, which are arranged on the adjacent track. At the top of the excavator and across the whole breadth of the same extends a pressing-roof *s*, having for its purpose to press the 100 irregular mass of snow into the buckets or onto the shovels to assist the certain transportation of the snow to the endless conveyer *l*, and also to prevent the carrying of the snow beyond the point *g*. This pressing-roof 105 extends tangentially or in an inclined direction from the upper laps of the elevator-chains, as shown, so that thereby the snow is more effectively guided downward. For transporting sand or grain from one point to 110 another the parts of the apparatus operate in a similar manner.

Having thus described my invention, what I claim is—

1. In an excavating-machine, the combina- 115 tion with a frame provided with an inclined plane, and guide-rollers mounted on said frame, the upper rear guide-roller being separated or spaced from the rear upper end of the inclined plane, of a series of endless ele- 120 vator-chains trained around said guide-rollers and inclined plane and provided with elevator buckets or blades, and a transverse conveyer arranged within the said chains in front of the rear guide-roller and below the space 125 between the same and the upper end of the inclined plane, substantially as set forth.

2. In an excavating-machine, the combina- 130 tion, with a main frame provided with an inclined plane, and guide-rollers mounted on said frame, of endless elevator-chains guided over said rollers and provided with elevator buckets or blades, a plow, a guide cylinder or drum arranged at the forward ends of the



elevator-chains and over which the same are guided between the plow and the lower end of the inclined plane, and separator-boards extending along and beyond the inclined plane, and projecting over the said plow, substantially as set forth.

3. In an excavating-machine, the combination, with a plow, and a trough arranged to the rear of the plow and containing a melting liquid, of the endless elevator-chains provided with buckets and adapted to dip into the liquid in said trough, substantially as set forth.

4. In an excavating-machine, the herein-described buckets, each being of scoop shape and provided with a springy blade portion formed from the rear wall, substantially as set forth.

5. In an excavating-machine, the herein-described cutter of U shape, provided with an intermediate shank, the forward edge of said U-shaped cutter being formed with a cutting edge, substantially as set forth.

6. The combination with a bucket, of an elevator-chain, provided with a U-shaped slot in its rear wall and having a transverse slot in its top wall, of a U-shaped cutter

adapted to pass through said U-shaped slot and provided with a shank adapted to pass through said transverse slot, substantially as set forth.

7. In an excavating-machine, the combination with an endless elevator-chain, of breaking-cutters pivoted thereto and shovels also pivoted thereto, said cutters and shovels being provided with tailpieces adapted to engage the inclined plane over which the chain passes, substantially as set forth.

8. In an excavating-machine, the combination, with endless elevator-chains, and buckets carried thereby, of a pressing-roof arranged between the ends of the elevator-chains across the upper portions thereof, and extending from the path of the buckets in a tangential or inclined direction relatively to the upper portions of the chains, substantially as set forth.

In testimony whereof I have signed this specification in presence of two subscribing witnesses.

WILHELM PAULITSCHKE.

Witnesses:

HARRY BELMONT,  
WILH. BERGER.