

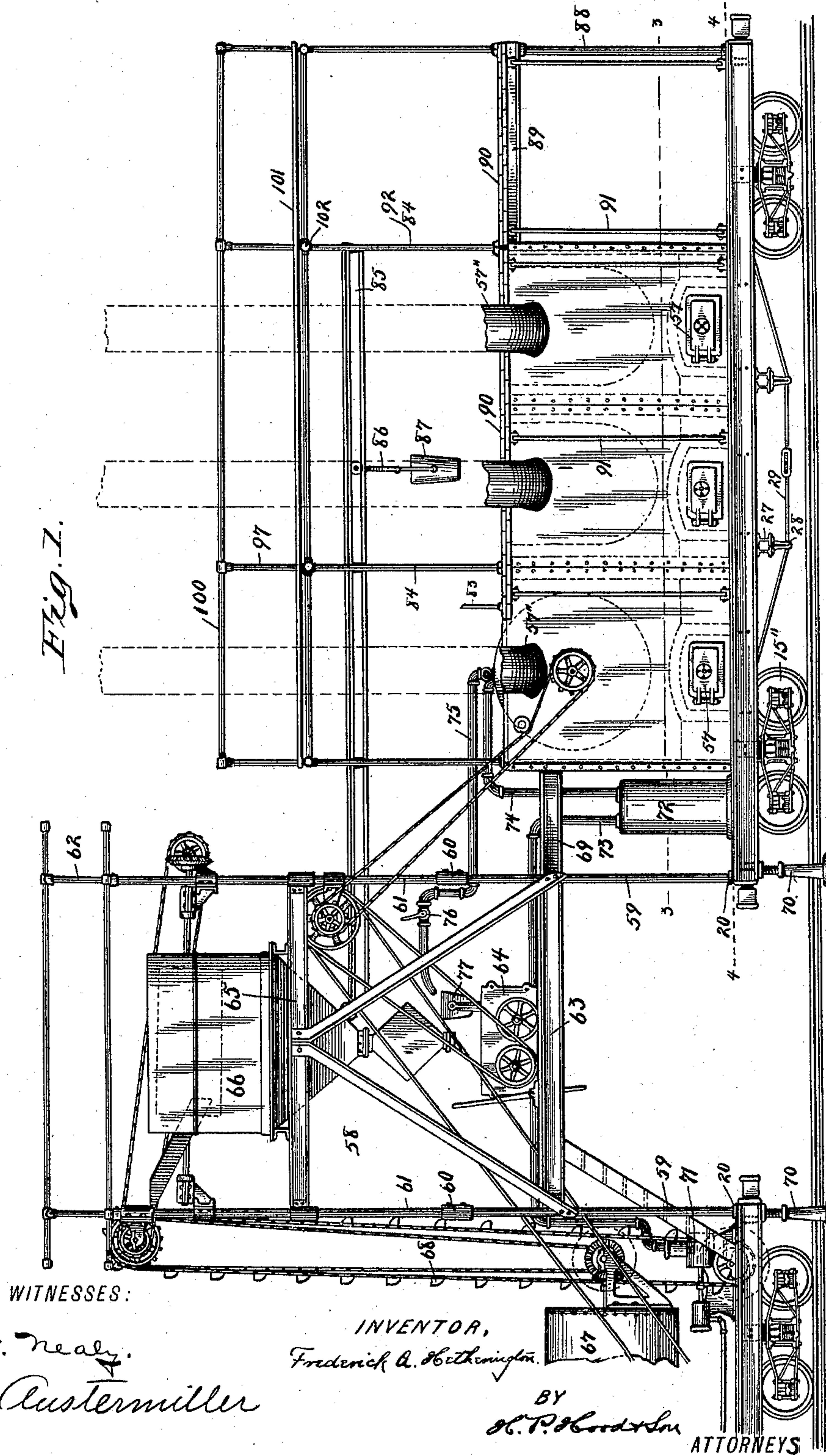
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6 Sheets—Sheet 1.

F. A. HETHERINGTON.
PORTABLE PAVING PLANT.

No. 585,867.

Patented July 6, 1897.



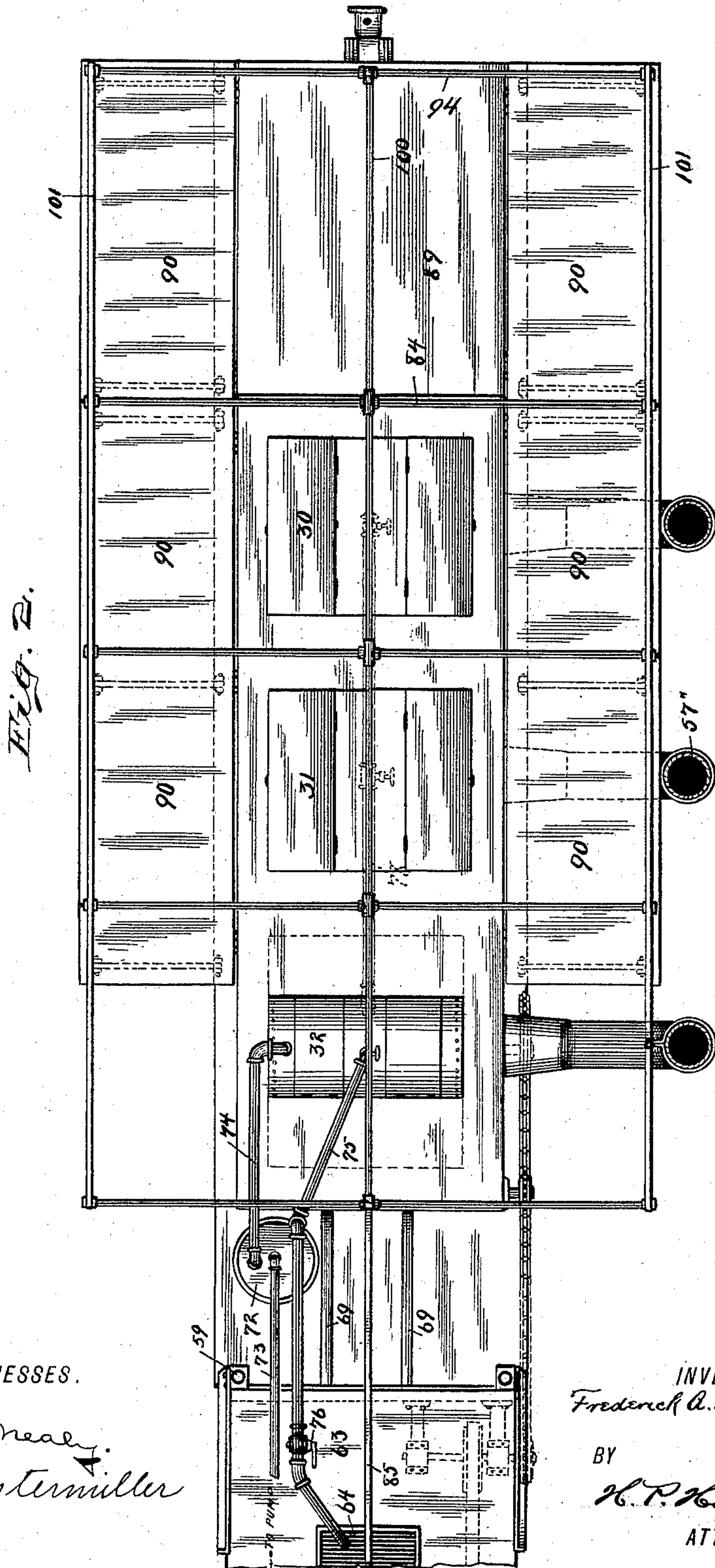
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WITNESSES.

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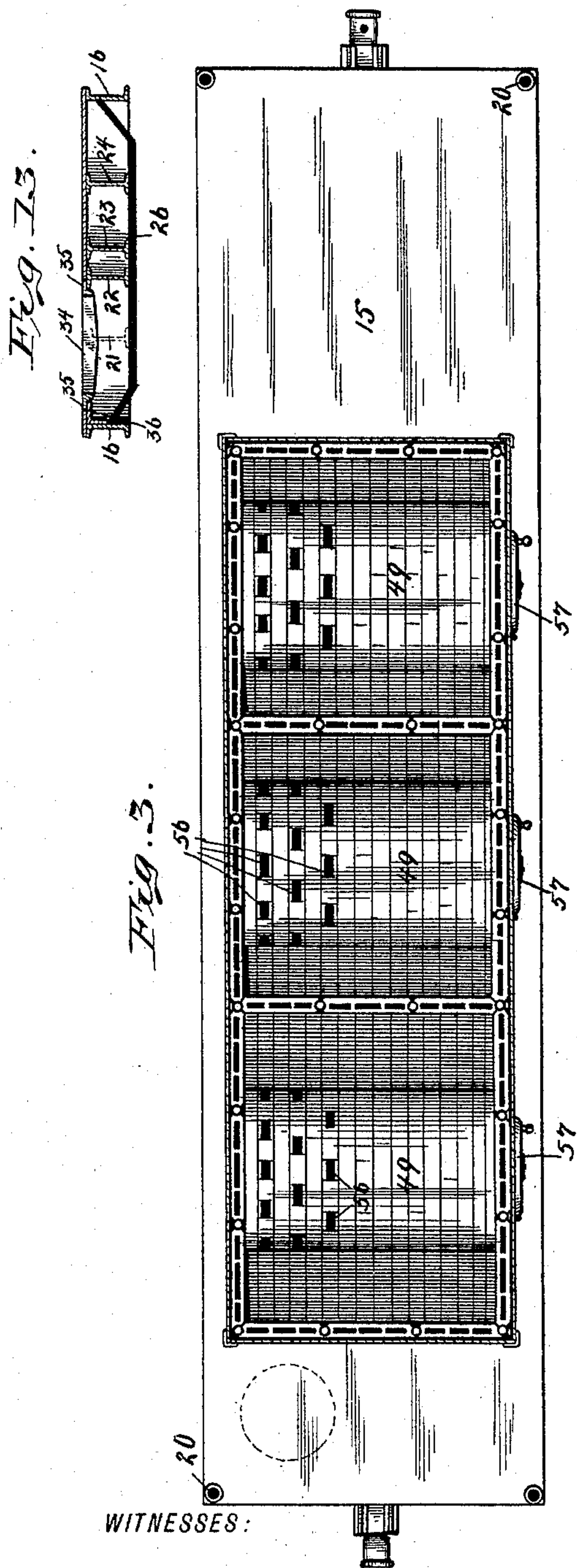
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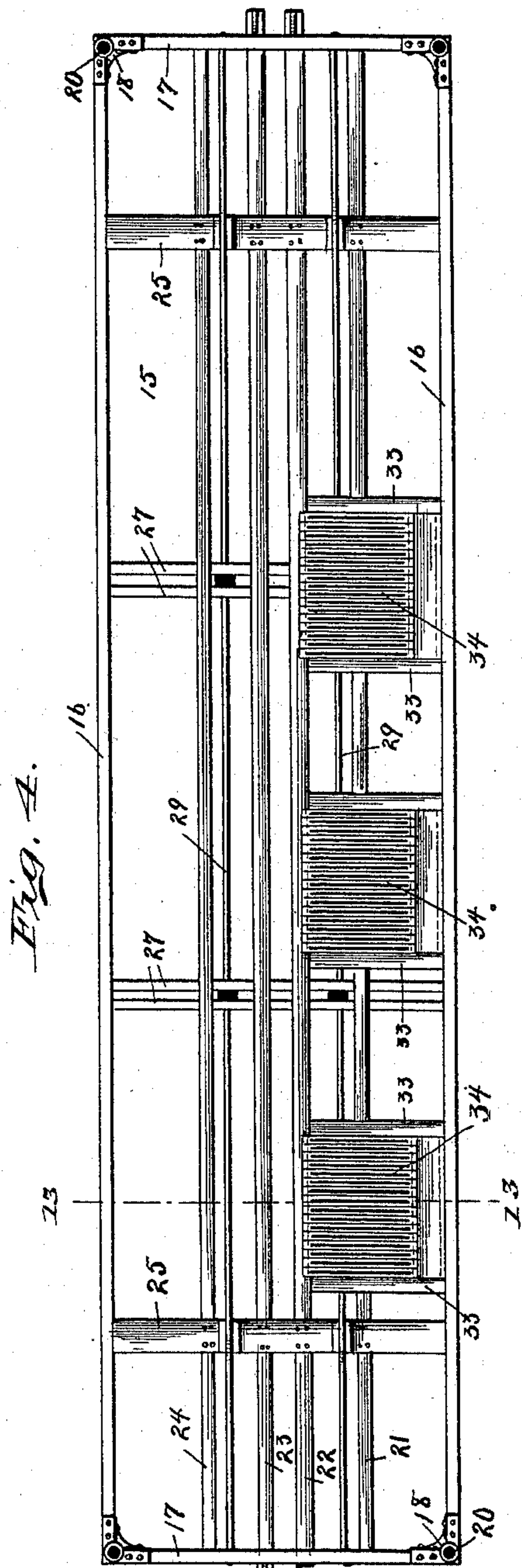
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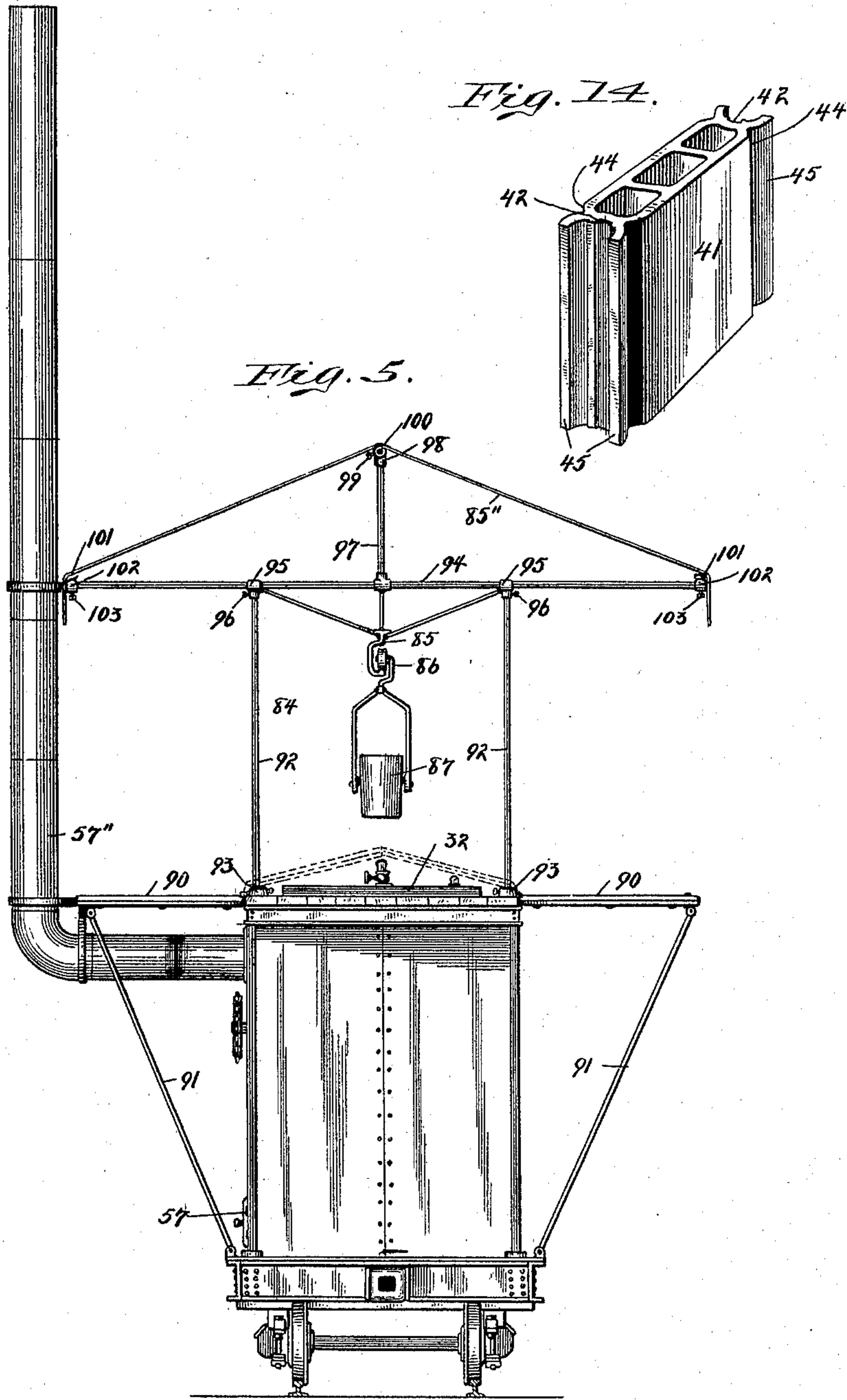
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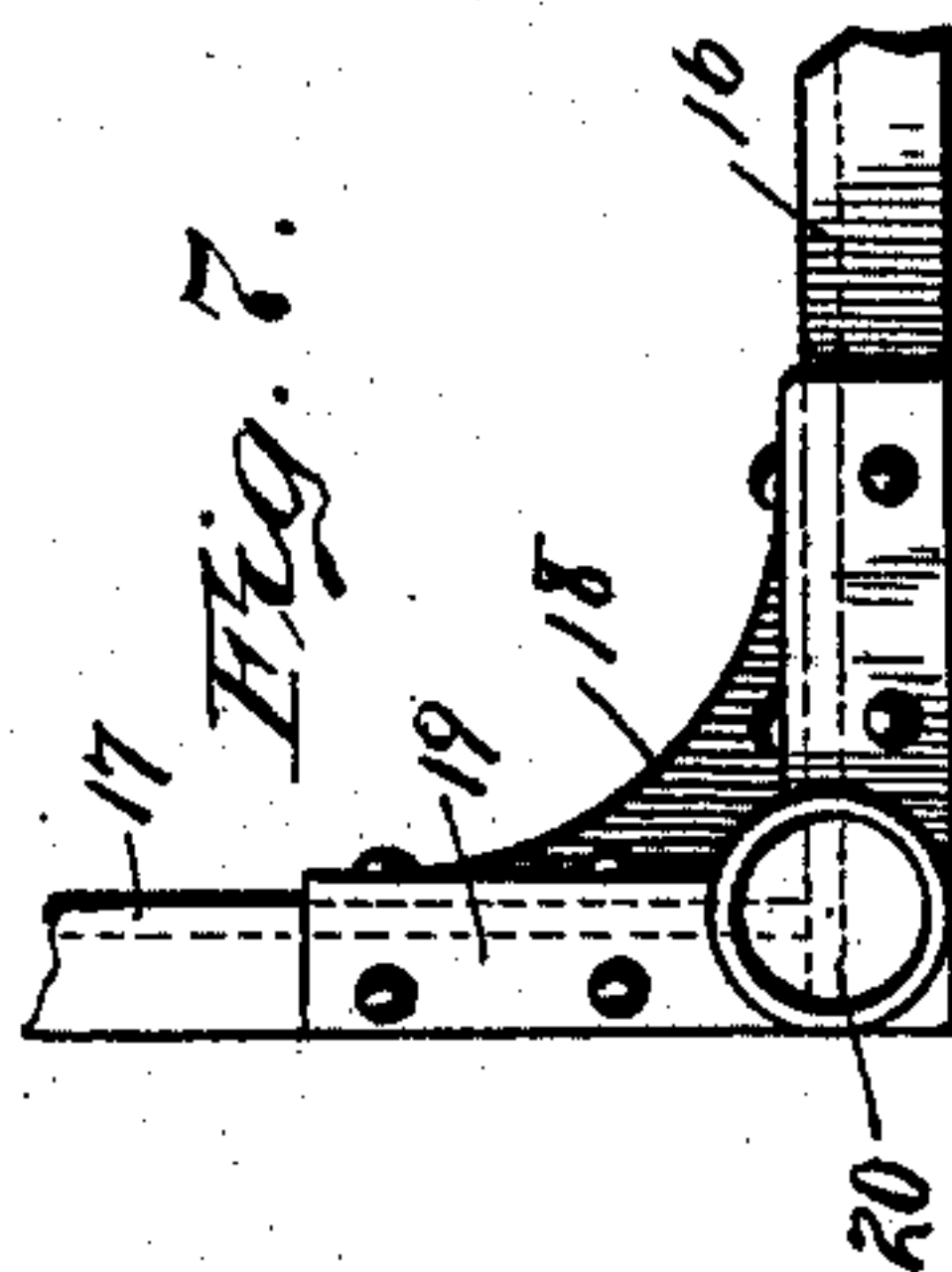
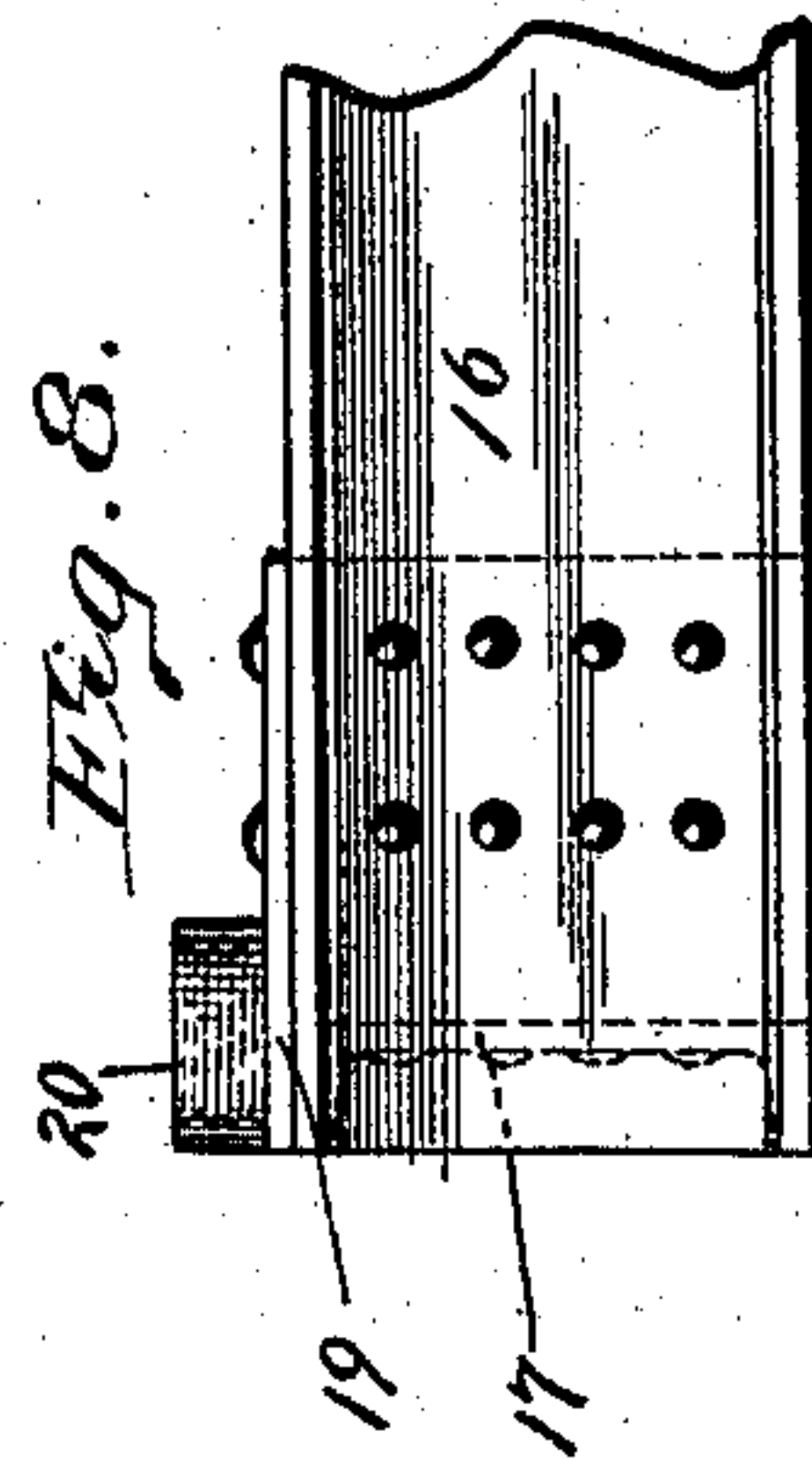
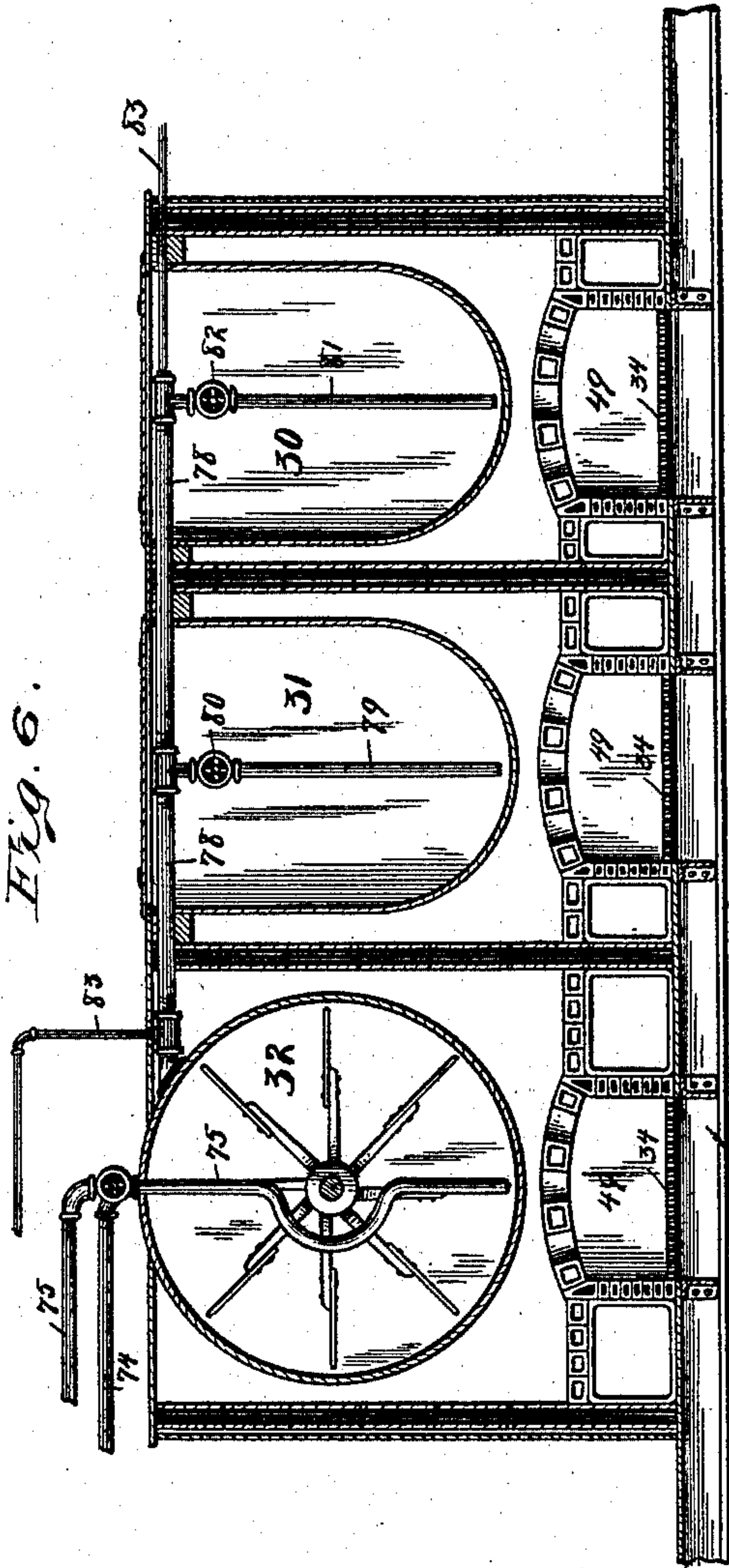
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(No Model.)

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Fig. 9.

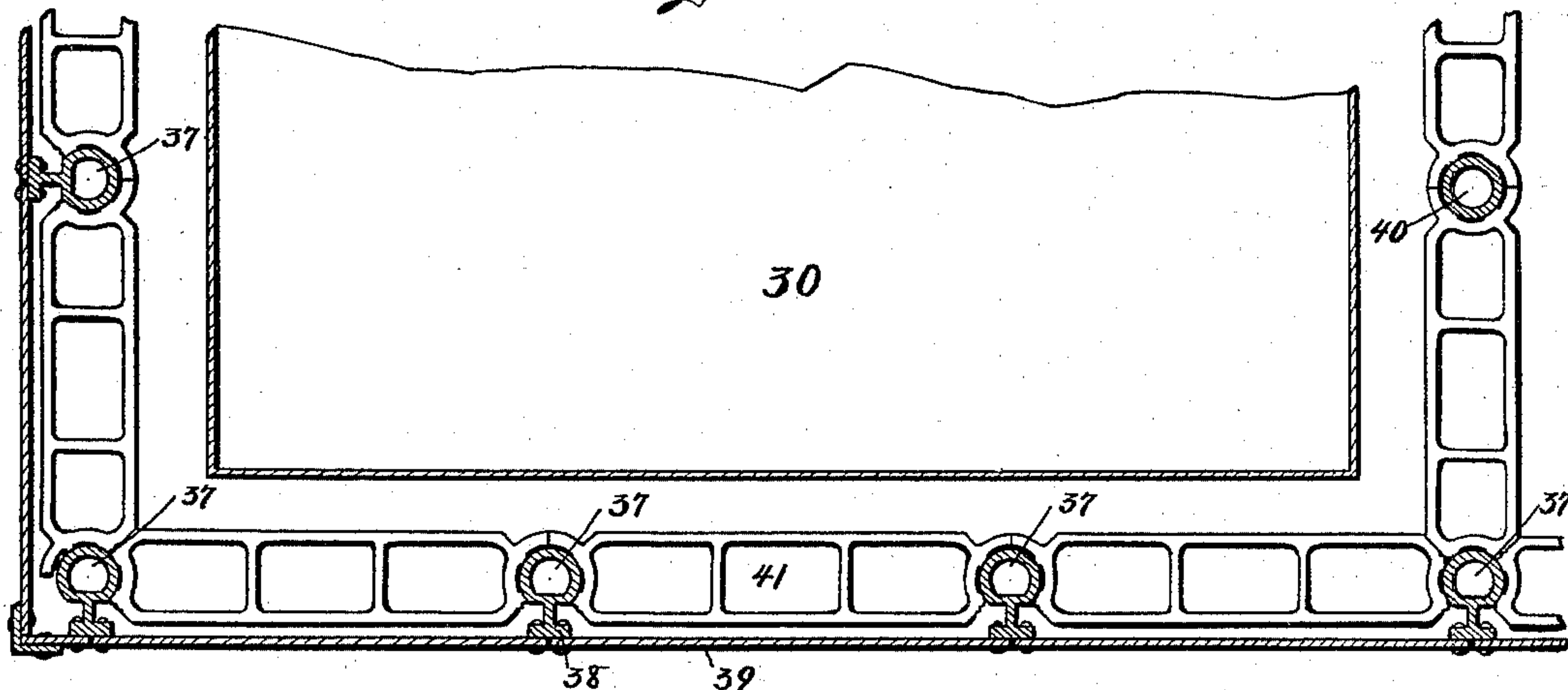


Fig. 10.

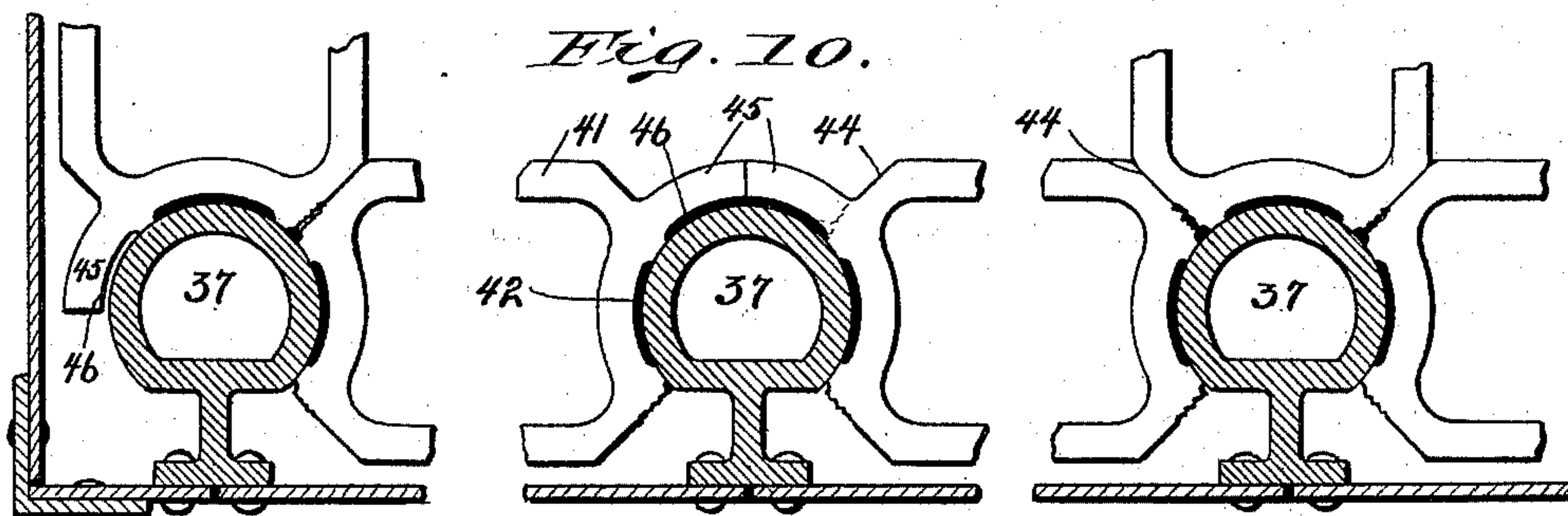
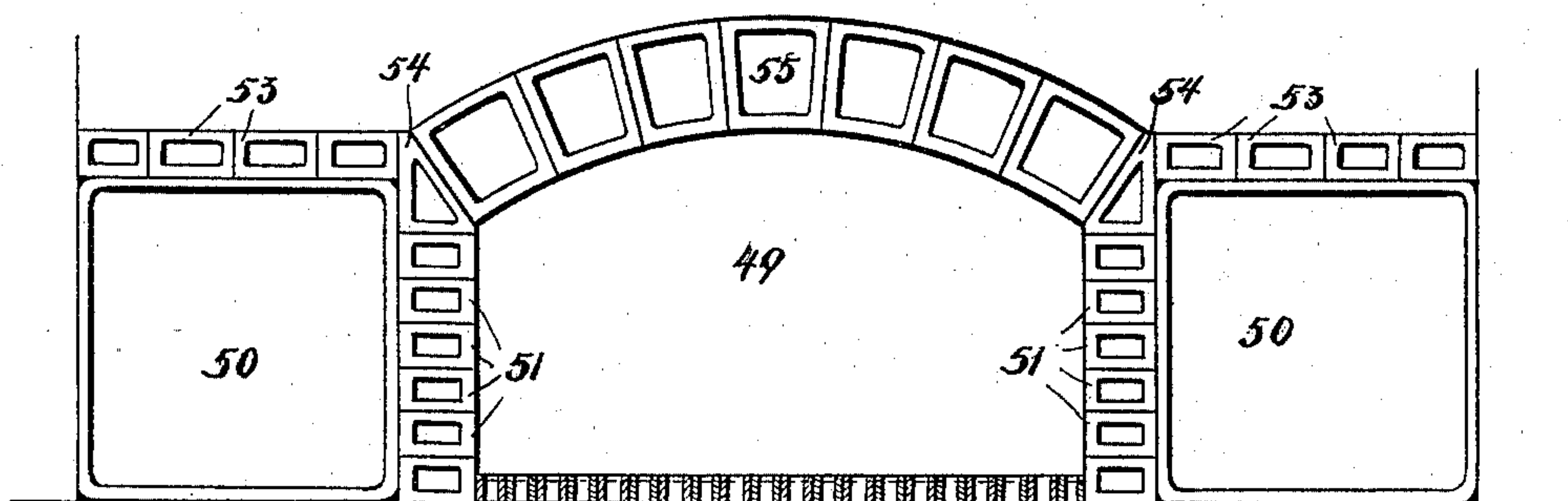


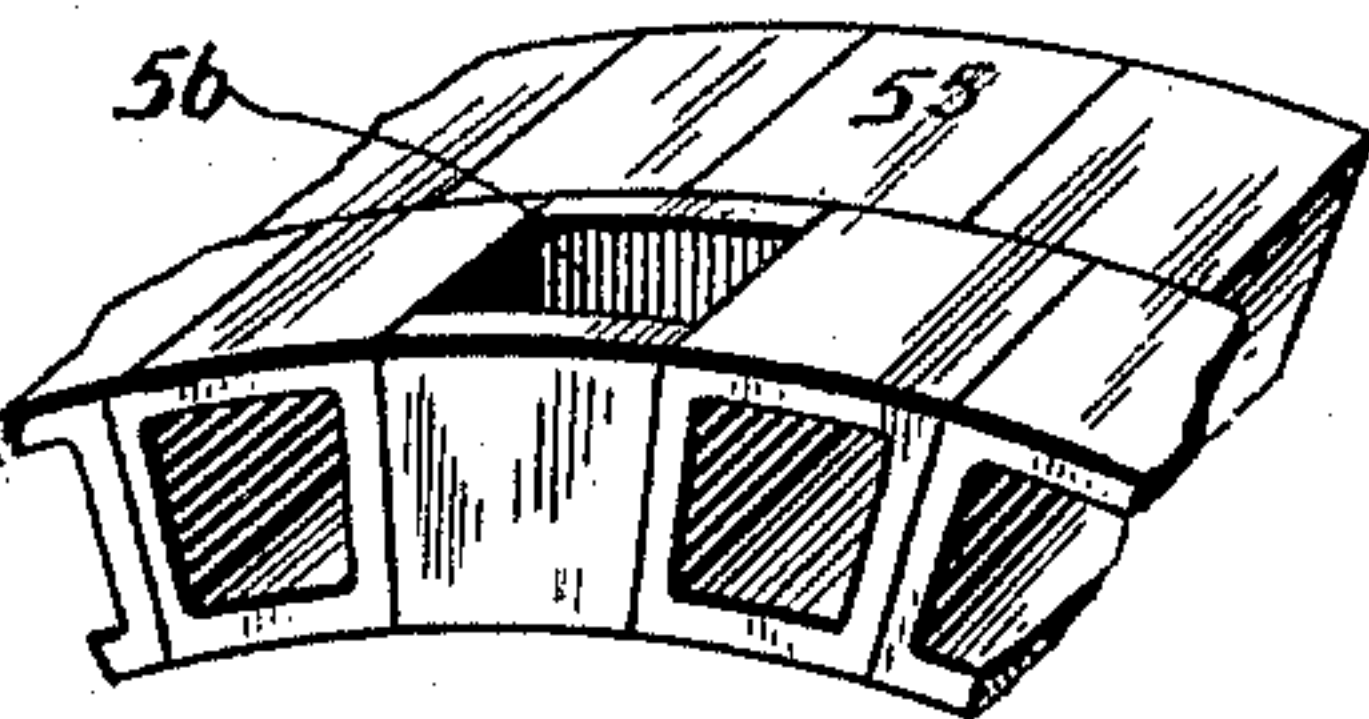
Fig. 11.



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Fig. 12.



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UNITED STATES PATENT OFFICE.

FREDERICK A. HETHERINGTON, OF INDIANAPOLIS, INDIANA.

PORTABLE PAVING PLANT.

SPECIFICATION forming part of Letters Patent No. 585,867, dated July 6, 1897.

Application filed December 5, 1896. Serial No. 614,579. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. HETHERINGTON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Portable Paving Plant, of which the following is a specification.

My invention relates to an improvement in portable paving plants similar to that shown in Letters Patent No. 540,912, issued to me June 11, 1895.

The object of my invention is to improve various details in the construction and arrangement of the "melting-car" and also in the construction of the central tower.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation of the melting-car, the central tower, and the adjacent end of the drier-car. Fig. 2 is a plan, on a larger scale, of the melting-car. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a section on line 4 4 of Fig. 1. Fig. 5 is an end elevation of the melting-car. Fig. 6 is a central vertical section thereof. Figs. 7 and 8 are details of the car construction. Fig. 9 is a horizontal cross-section of a portion of the furnace-setting. Fig. 10 is an enlarged detail thereof. Fig. 11 is an end elevation of the fire-arch and surrounding setting. Fig. 12 is a detail of said arch. Fig. 13 is a cross-section on line 13 13 of Fig. 4. Fig. 14 is a detail of one of the tiles of the furnace-setting.

In the drawings, 15 indicates a car or other portable supporting-platform provided with trucks 15". Car 15 is composed of side sills 16, of channel-iron, and end sills 17. The side and end sills are secured together by means of an angle-iron 18, to which the said sills are riveted. Formed integrally with angle-iron 18 is a flange 19, which rests upon and is riveted to the upper flanges of the sills, and carried by flange 19, substantially at the corner of the frame, is a socket 20. Extending longitudinally between the end sills are a number of I-beams 21, 22, 23, and 24, the said I-beams being secured to the end sills by means of suitable angle-irons. Riveted to the upper surfaces of the I-beams, near each end thereof, over the truck center is a transverse plate 25, the ends of which are bent

down and riveted to the inner faces of the side sills. Riveted to the under surfaces of the I-beams immediately below plate 25 is a plate 26, which rests upon one of the trucks 15". In order to support the middle portion of the frame, two pairs of transverse I-beams 27 are secured to the under surfaces of the longitudinal I-beams and the side sills, and secured to the under sides of these transverse I-beams are struts 28, adapted to receive the rods 29, which pass up over plates 25 and through the end sills.

Mounted upon the car are a number of melting-kettles 30 and 31 and an agitator 32. Each kettle and the agitator are provided with a separate setting and furnace, although, if desired, a single furnace may be constructed, so as to heat all of the kettles and the agitator. The separate furnace for each kettle is, however, more desirable, and the grates are preferably set in the floor of the car, so that the ashes may drop through upon the ground, thus avoiding the need of ash-pits.

In order to set the grates in the floor of the car, the I-beam 21 is made of several sections, and three pairs of headers 33, formed of channel-iron or of any other suitable shape, are set across from I-beam 22 to the adjacent side sill 16 and secured thereto by any suitable means, the various sections of I-beam 21 being also secured to said headers. The grate-bars 34 are then placed between the headers, the flanges 35 thereof resting at one end upon the upper flange of beam 22 and at the other end either upon the side sill 16 or upon the upper flange of a cross-piece 36, set between the headers and secured thereto. The upper surface of the framework of the car, with the exception of the grate-surfaces, is provided with a flooring, preferably of sheet-iron. Upon this flooring and surrounding the grates is the setting for the various kettles and agitator. It is necessary that this setting be made as light as possible, but still be of sufficient thickness to retain the heat.

Mounted upon the floor of the car and secured thereto in any suitable manner, if desired, is a series of upright columns 37, formed, preferably, of cast-iron, provided with flanges 38, to which the outer sheeting 39 may be riveted. Columns 37 are uniformly spaced and

extend around the agitator and the melting-kettles at a short distance therefrom. Mounted between the agitator and the adjacent kettle and between the two kettles are upright columns 40, formed either of cast-iron or of wrought-iron pipe, the said columns lying between two opposite columns 37 and uniformly spaced between said columns. It is desirable that a tile be provided which, with but slight changes from its finished state, may be made to fit between any of the columns 37, between said columns and columns 40, and between the columns 40, and which will at the same time completely protect the said columns from the heat of the fire. To this end I have designed a tile 41, each end of which is provided with a socket 42, adapted to receive and cover one-half of the circumference of one of said columns. At substantially forty-five degrees from each side of the longitudinal center of the tile the ends thereof are beveled, as at 44, upon lines substantially radial to the center of the socket 42. Extending from each of these beveled surfaces and forming a continuation or rather a part of the socket 42 is a lip 45, which is formed integral with the tile. When the tiles are to be inserted between columns which are to be entirely surrounded and protected by the tile, the lips 45 are allowed to remain, the ends of the lips of the adjacent tiles meeting, as shown in Fig. 9. When the tiles are to be placed about a column at other than one hundred and eighty degrees apart, the entire lip 45 or a portion thereof may be knocked off. As a general rule the beveled surfaces 44 lie substantially at forty-five degrees from the longitudinal center of the tile, but of course this angle may be varied, if desired. In order to facilitate the removal of lip 45 and cause the break to occur substantially in line with the beveled surface 44, the said lip is cut away on its inner face 46 to a point substantially in line with said surface 44.

Extending transversely across each setting over each set of grate-bars is a fire-arch 49. For the sake of lightness the fire-arch 49 is composed, first, of two series of large hollow tiles 50, square in cross-section, one of said series being placed in each corner between the floor of the car and the tiles 41. Mounted between the tiles 50 and the grate is a vertical series of tiles 51, and resting upon each series of tiles 50 is a horizontal series of tiles 53. Upon the top of each series of tiles 51 is a series of tiles 54, adapted to receive the thrust of the arch, which is composed of several series of hollow tiles 55, the arrangement being such that the thrust is taken by the upper wall of tiles 50 and the horizontal tiles 53. At the rear end of each arch several series of openings 56 are formed through said arch, so as to allow the heated gases to pass up into contact with the kettles. If all of the heat should be caused to pass to the extreme rear of the arch before passing up into contact with the kettle, the rear end of said kettle

would become hotter than the forward end thereof. In order, therefore, to more uniformly distribute the heat, several series of openings 56 are formed, the openings in each series gradually increasing either in number or size toward the rear of the arch. Opening into each setting is a fire-door 57, and also opening into each setting above the fire-arch is a smoke-stack 57".

The plant consists of two similar portable platforms and a central tower mounted between the adjacent ends of the platforms, so as to form a driveway therebetween. The central tower 58 consists of four upright posts 59, the lower end of each of which is mounted in one of the sockets 20. Detachably secured to the upper end of each of posts 59 by means of a coupling 60 is a post 61, to the upper end of which is secured the roof structure 62 of the tower. Detachably secured to posts 59, at a sufficient distance from the ground to allow a wagon to be driven thereunder, is a platform 63, upon which is mounted a mixer 64, which is adapted to receive and mix the ingredients of the paving material. Detachably secured to posts 61 is a platform 65, upon which is mounted a hot-sand bin 66, into which the hot sand from a drier 67 may be delivered by means of an elevator 68. That portion of platform 63 which lies between the posts 59 of the melting-car is secured thereto, and mounted between this beam and the setting of the agitator are two I-beams, forming a platform 69. The mixer 64 is detachably mounted over an opening in platform 63, and when the plant is to be packed for shipment the said mixer is slid from platform 63 onto platform 69, where it remains during the transportation of the plant. The central tower is built upon and supported by the adjacent ends of the two platforms. In order to prevent the said ends from becoming flexed, an adjustable support 70 is placed under each of the adjacent corners of the two platforms.

In order to transfer the contents of the melting-kettles into the agitator and from the agitator into the mixer, an air-pump 71 is placed upon one of the portable platforms. Mounted upon the melting-car is a reservoir 72, which is connected with pump 71 by means of a pipe 73. From reservoir 72 a pipe 74 runs into the upper part of the agitator, which is of course made substantially air-tight. From the lower part of agitator 32 a pipe 75, provided with a valve 76, passes to a measuring-bucket 77, which is pivotally mounted over the mixer 64. Passing from the upper part of the agitator is a pipe 78, which extends across the two melting-kettles. Leading down from pipe 78 into the bottom of kettle 31 is a pipe 79, provided with a valve 80, and leading down into kettle 30 is a similar pipe 81, provided with a valve 82. The pipe 78 may be placed in any suitable position, but in order to keep the contents thereof warm it may be mounted beneath the covers

of the kettles. As a further means for keeping the contents of the various pipes warm, and thus preventing them from becoming clogged, a small steam-pipe 83, connected with any suitable steam-supply, may be run through said pipes.

In operation when it is desired to transfer the contents of kettle 30 into the agitator valve 82 is opened and valves 80 and 76 are closed. Pump 71 is then operated so as to produce a vacuum in the agitator, thus causing the melted asphalt in kettle 30 to be drawn out through pipes 81 and 78 into the agitator. To remove the contents from kettle 31, valve 82 is closed and valve 80 is opened. In order to force the material from the agitator into bucket 77, valves 80 and 82 are closed and valve 76 is opened. Pump 71 is then operated as a compressor, thus compressing the air in the agitator and forcing the asphalt out through pipe 74. It will be readily understood that the agitator may be dispensed with, if desired.

Detachably secured to the upper part of the setting of the kettles and agitator is a frame 84, adapted to support a roof 85". It is sometimes necessary to quickly transfer a small quantity of asphalt from the kettles to the mixer. For this purpose a trolley-track 85 is suspended over the kettles from frame 84. Upon track 85 is mounted a trolley 86, supporting a bucket 87. Track 85 extends out over the mixer 64, so that the contents of bucket 87 may be easily dumped therein. Bucket 87 may be filled by means of a long-handled dipper.

At the rear end of the melting-car a pair of posts 88 are mounted in the sockets 20, and upon the upper ends of these posts is supported a platform 89, which lies substantially even with the tops of the melting-kettles. In order to form a running-board around the tops of the melting-kettles and agitator, a series of folding platforms 90 are hinged to the upper corners of the setting and to platform 89. Platforms 90 are slightly wider than one-half the width of the setting and are adapted to be folded over toward each other, so that when so folded over they form a slanting roof for the car, as shown in dotted lines in Fig. 5. The platforms are held in their open horizontal position by means of detachable braces 91, which are secured at one end to the outer ends of the said platforms and at the other end to the side of the car.

The frame 84 consists of a series of upright rods 92, the lower end of each of which is detachably secured in a socket 93, mounted on the upper part of the kettle-setting. The rods 92 are set in pairs upon opposite sides of the setting, and mounted upon the top of each pair of rods is a transverse rod 94, provided with sockets 95, adapted to fit down over the upper ends of rods 92. Set-screws 96 are provided for securing said sockets in place. Secured to the middle of each trans-

verse rod 94 is an upright 97, to the upper end of which is secured an eye 98, provided with a set-screw 99. For the purpose of tying the upper ends of uprights 97 together and thus bracing the frame a rod 100 is passed through the eyes 98 and secured therein by means of the set-screws 99. For the purpose of tying the outer ends of the transverse rods 94 together a bar or rod 101, provided with sockets 102, adapted to fit over the ends of said rods 94, is provided, the said bar being held in position by means of the set-screws 103. Rods 94 extend out beyond uprights 92, and the arrangement and length thereof is such that the weight of each half of the entire structure (composed of rods 94, the uprights 97, and the rods 100 and 101) is balanced upon the upper ends of the supports 92. By this arrangement there is no transverse stress upon the upper ends of the supports 92, so that the structure may be made very light. The roof 85" is preferably formed of canvas and is supported upon rods 100 and 101.

As will be readily seen, the entire structure may be easily taken apart and packed for shipment and may be as easily reassembled.

I claim as my invention—

1. In a portable paving plant, the combination of a pair of portable platforms carrying mechanism for preparing the ingredients of the paving, a platform mounted between said portable platforms, so as to form a driveway beneath said intermediate platform, a storage-platform mounted upon and carried by one of the portable platforms substantially in line with said first-mentioned platform, and ways, carried by the intermediate platform and the storage-platform, upon which the mixing mechanism may be mounted, the arrangement being such that the mixing mechanism may be moved from the intermediate platform to the storage-platform in preparing the plant for transportation.

2. In a portable paving plant, the combination with a pair of portable platforms carrying mechanism for preparing the ingredients of the paving, of standards mounted upon the adjacent ends of said portable platforms, a detachable intermediate platform secured to said standards between said portable platforms, so as to form a driveway beneath said detachable platform, a storage-platform mounted upon one of the portable platforms substantially in line with the detachable platform, and ways carried by the intermediate and storage platforms upon which the mixing mechanism may be mounted, the arrangement being such that the assembling mechanism may be moved from said detachable platform to the storage-platform in preparing the plant for transportation.

3. In a portable paving plant, a portable platform therefor consisting of the outer frame, the intermediate longitudinal beams, one or more pairs of headers mounted be-

tween the frame and one of said longitudinal beams, and a series of grate-bars mounted between each pair of headers with their ends resting upon or supported by said longitudinal beam and said frame and forming a portion of the floor of the platform, substantially as and for the purpose set forth.

4. A portable platform consisting, in part, of the outer frame of channel-iron, an angle-iron mounted between the ends of said channel-irons and secured thereto, a flange carried by said angle-iron and resting upon the upper flanges of the channel-irons, and a socket carried by said flange, substantially as described.

5. A portable platform consisting, in part, of the outer frame of channel-iron, and angle-iron mounted between the adjacent ends of said channel-irons and secured thereto, and a socket mounted at or near the corners of said frame, substantially as described.

6. A tile for furnace-settings having a socket formed at one end thereof and having the corners of said end beveled, and a lip extending from one or both of said beveled surfaces and forming a continuation of the socket, as and for the purpose set forth.

7. A tile for furnace-settings, having a socket formed at one end thereof and having the corners of said end beveled on lines substantially radial to the center of said socket, a lip formed integral with said tile extending from said beveled surfaces and arranged so as to form a continuation of said socket, a portion of the inner surface of said lips being removed so as to facilitate the removal of said lips upon a plane substantially in line with the beveled surface.

8. A tile for furnace-settings, having a socket formed at each end thereof and having the corners of each end beveled on lines substantially radial to the center of the adjacent socket, and a lip formed integral with the tile extending from each of said beveled surfaces and arranged to form a continuation of the corresponding socket, substantially as described.

9. A tile for furnace-settings having a socket formed at each end thereof and having the corners of each end beveled on lines substantially radial to the center of the adjacent socket, a lip formed integral with the tile extending from each of said beveled surfaces and arranged to form a continuation of the corresponding socket, a portion of the inner surface of said lip being removed so as to facilitate the removal of said lip upon a plane substantially in line with the beveled surface.

10. In a furnace-setting, the combination with the grate-bars, of a series of large hollow tiles mounted upon each side of said grate-bars, a vertical series of tiles mounted between said tiles and the grate-bars, and an arch mounted between said series of tiles and extending over the grate-bars, substantially as described.

11. In a paving plant, the combination with the melting-kettles, of an air-tight chamber, means for compressing air into and for exhausting the air from said chamber, a pipe leading from said exhausting and compressing means into said chamber, a pipe forming a communication between said chamber and kettles, and a pipe leading from said chamber to the exterior thereof, substantially as described.

12. A detachable roof structure consisting of two series of posts, a series of transverse bars secured to each pair of said posts and extending out beyond said posts, an upright carried by each transverse bar, means for connecting said uprights, the arrangement being such that each half of the structure above the posts will be balanced on said posts so that there will be no lateral stress upon said posts.

13. In a roof structure, a pair of uprights, a transverse bar carried by said uprights, and an upright carried by said transverse bar, the transverse bar extending beyond the supporting-uprights sufficiently to cause the weight to be balanced upon the supporting-uprights so that said uprights will be subjected to no lateral stress.

14. In a paving plant, the combination with the melting-kettles thereof, of pipes leading therefrom through which the melted material may be withdrawn, and covers for said kettles extending over and covering said pipes, whereby the material passing through said pipes is kept warm, substantially as described.

15. In a paving plant, the combination with the melting-kettles thereof, of pipes leading therefrom through which the melted material may be withdrawn, smaller pipes mounted in said pipes and connected with a suitable source of heat, whereby the contents of said first-mentioned pipes are kept warm, substantially as described.

16. In a paving plant, the combination with the melting-kettles thereof, of two pipes, one mounted within the other, one of said pipes being connected with a suitable source of heat and the other of said pipes communicating with the interior of the melting-kettles, substantially as and for the purpose set forth.

17. In a portable paving plant, a pair of portable platforms carrying means for preparing the ingredients of the paving material, standards erected on the adjacent ends of said platforms, an intermediate platform mounted between said standards and carrying means for assembling said ingredients, and supports detachably mounted beneath the portable platforms beneath the standards, as and for the purpose set forth.

18. In a portable paving plant, the combination with the melting-kettles thereof, of platforms hinged at each side of said kettles near the top thereof, and means for supporting said platforms in position to form a running-board at the sides of said kettles, the

arrangement being such that said platforms may be folded over into position to form a roof for the kettle-car.

19. In a portable paving plant, the combination with the melting-kettles thereof, of platforms hinged at each side of said kettles near the top thereof, the said platforms being slightly greater in width than one-half the distance between the hinge-line of the oppo-

site platforms, and means for supporting said platforms in position to form a running-board at the sides of said kettles, the arrangement being such that said platforms may be folded over into position to form a roof for the car.

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Witnesses:

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