

(No Model.)

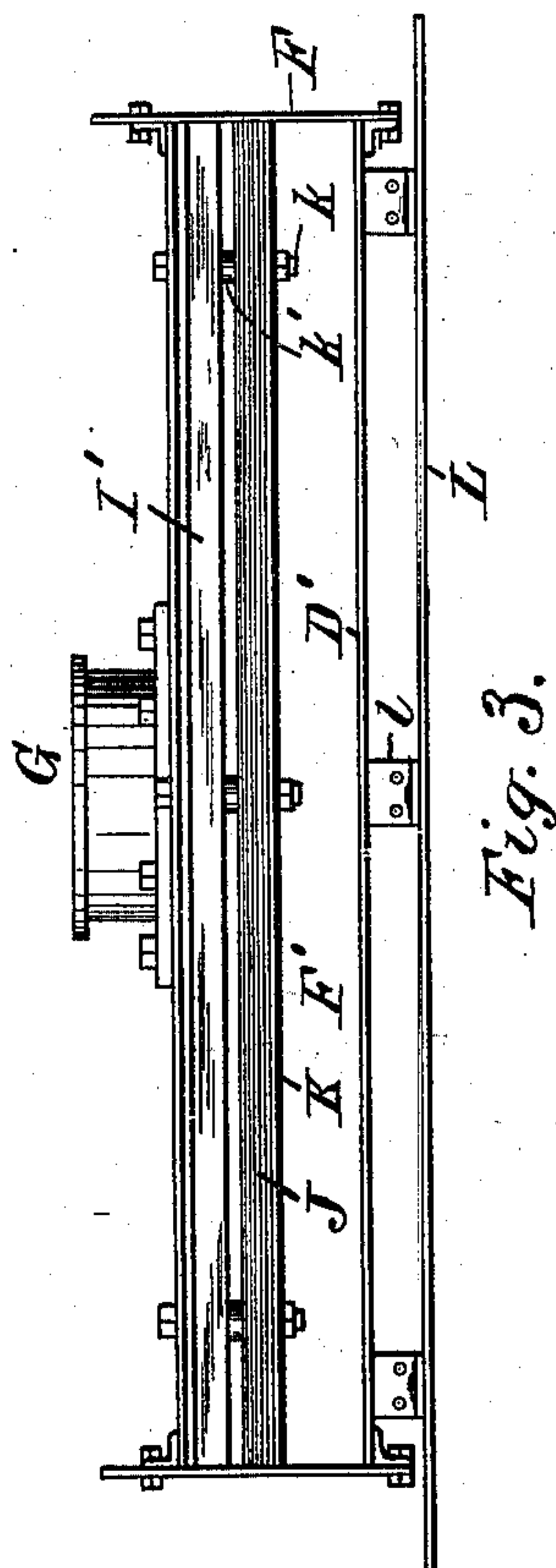
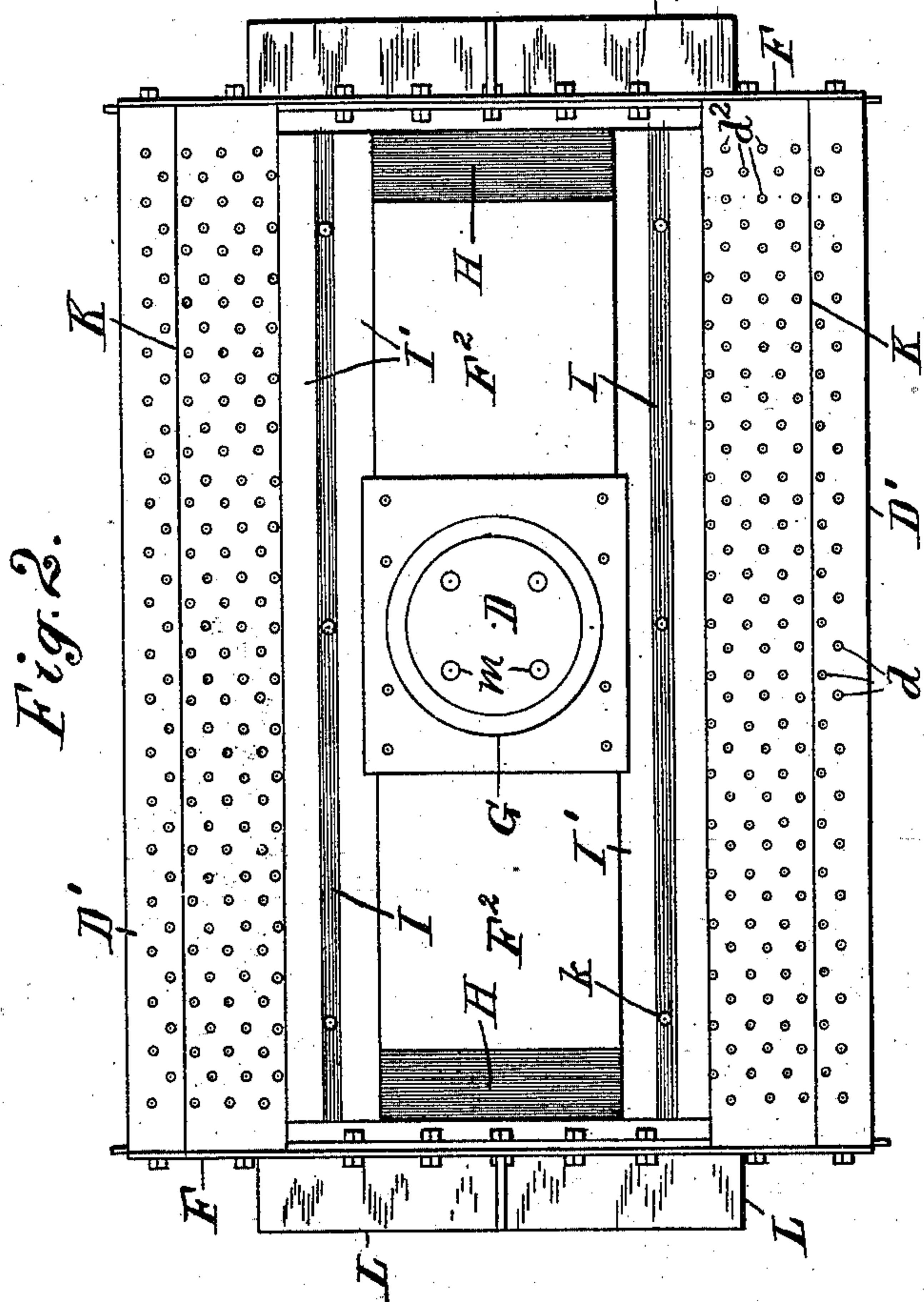
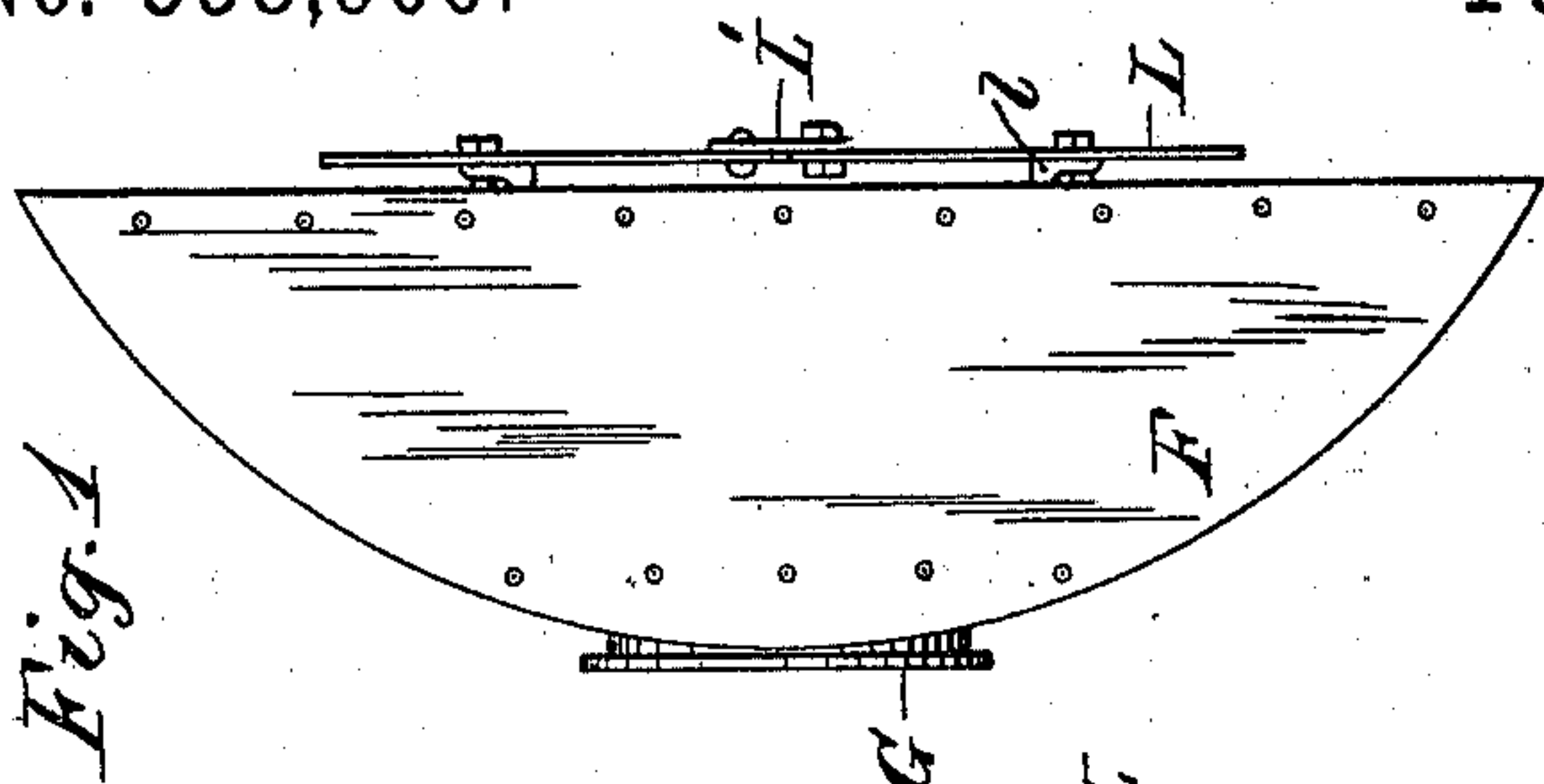
2 Sheets—Sheet 1.

J. J. HOGAN.

## STEAM EXTRACTOR FOR BOILER DRUMS.

No. 558,906.

Patented Apr. 21, 1896.



Attest:

Edw. F. Kinsey.  
Jacob Marx.

*Inventor.*

John J. Hogan, per  
Thomas S. Crane, Atty.

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2 Sheets—Sheet 2

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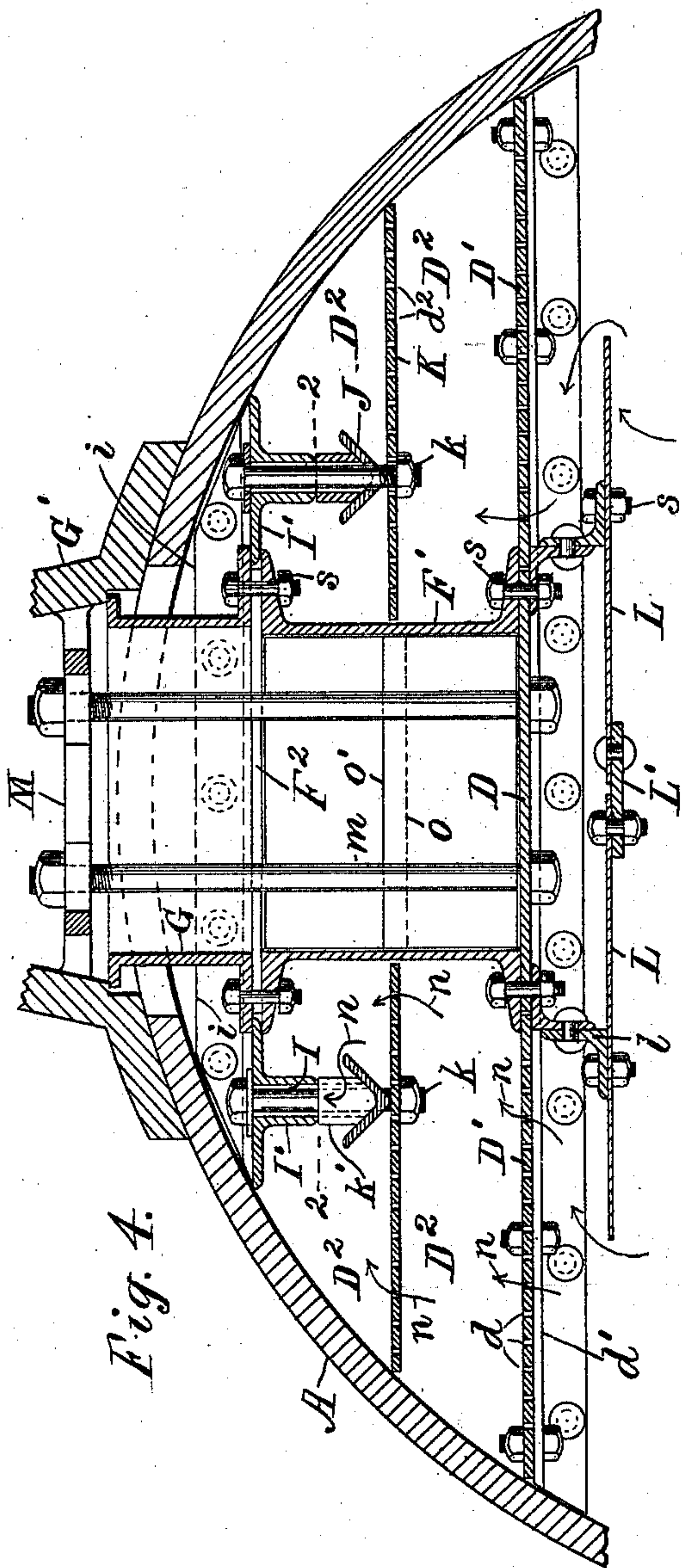


Fig. 4.

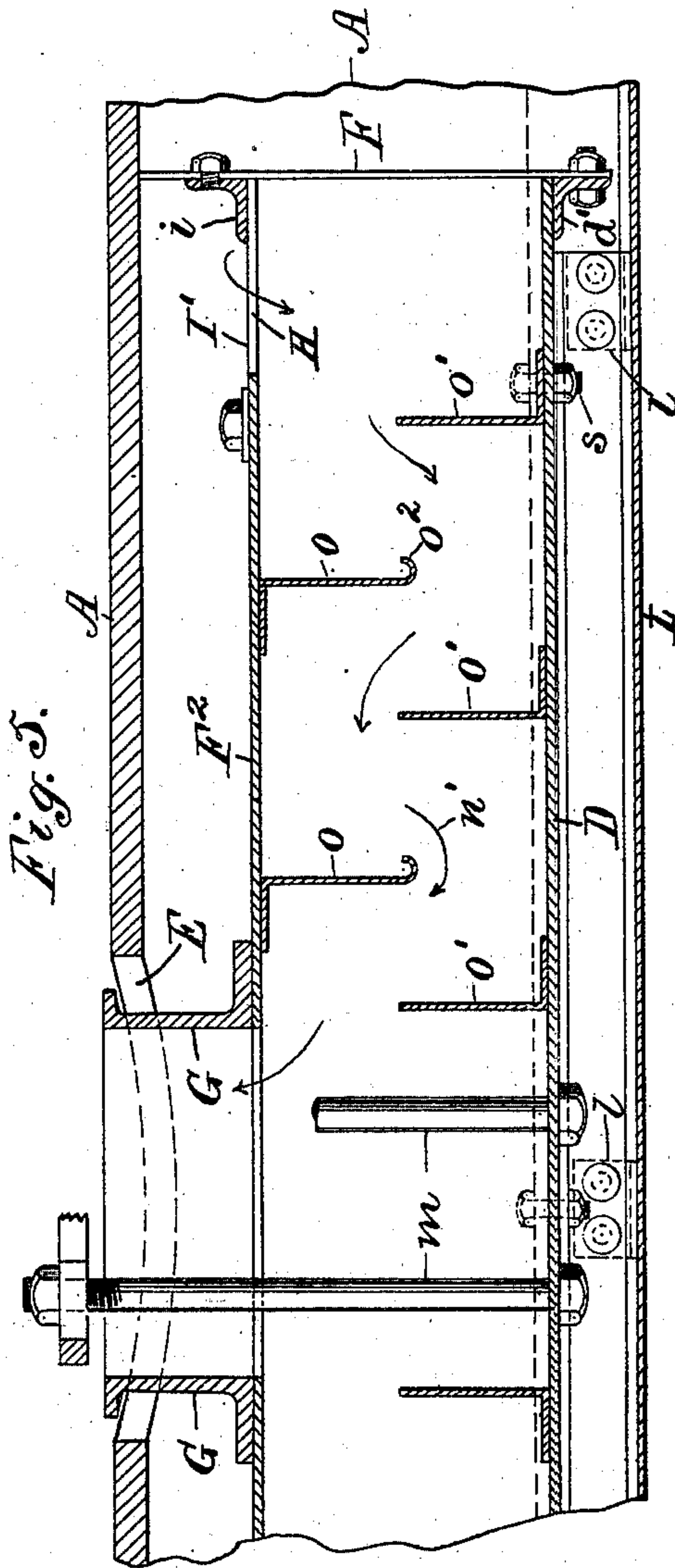


Fig. 5.

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L. Lee.  
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Inventor  
John J. Hogan  
per Thomas S. Crane, Atty.



# UNITED STATES PATENT OFFICE.

JOHN J. HOGAN, OF MIDDLETOWN, NEW YORK.

## STEAM-EXTRACTOR FOR BOILER-DRUMS.

SPECIFICATION forming part of Letters Patent No. 558,906, dated April 21, 1896.

Application filed September 13, 1895. Serial No. 562,408. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. HOGAN, a citizen of the United States, residing at Middletown, Orange county, New York, have invented certain new and useful Improvements in Steam-Extractors for Boiler-Drums, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to furnish a cheap and effective device for delivering dry steam from a steam-drum having steam or water tubes discharging therein. Various forms of dry-pipes have been heretofore used in such cases; but are very often deficient in capacity or area, and this common defect I obviate by converting the top of the steam-drum for a portion of its length into a separating-chamber having its floor formed of a perforated plate and having a separator-box or dry-pipe of special construction in its interior to complete the separation of the steam from the liquid in its final passage to the outlet-pipe. The construction is adapted for manufacture apart from the steam-drum and for support therein by a few bolts which are accessible through the outlet nozzle or thimble. The device is formed of longitudinal strips of suitable width to pass through a manhole in the head of the drum, and the device may thus be readily inserted within the drum and its parts secured inside in the proper relation after the drum is completed and furnished with the usual heads.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is an elevation of one end of the steam-extractor. Fig. 2 is a plan of the extractor devices. Fig. 3 is a side elevation of the same. Fig. 4 is a section of the upper part of the drum through the center line of the steam-extractor, and Fig. 5 is a side elevation of one end of the extractor and the upper part of the drum adjacent to the outlet-nozzle. Figs. 4 and 5 are drawn upon a larger scale than the remaining figures.

A designates the shell of the steam-drum, having water-tubes B extended through its bottom.

C designates the water-line, and D D' the floor of the separating-chamber D<sup>2</sup>. Such floor is formed with numerous small holes *d* and extends beneath the steam-outlet E a suitable distance, and plates F are extended

upward from its ends into contact with the shell A, thus forming a large separating-chamber below the steam-outlet E. A rectangular box is formed along the middle of the floor D and forms a dry-pipe, which is connected at its middle by a nozzle G with the steam-pipe thimble G'. The side walls F' of the dry-pipe are conveniently made of channel-beams and the top of a plate F<sup>2</sup>, leaving at its opposite ends (adjacent to the plate F) apertures H for the admission of the steam.

The apertures H form the only inlets for admitting the steam or vapor to the dry-pipe and to the nozzle G. The plate F<sup>2</sup> is extended laterally by suitable attachments I' to the shell A, and is formed with longitudinal passages I, through which, exclusively, the steam is admitted above the top of the dry-pipe. Gutters J, conveniently formed of angle-iron, are sustained adjacent to the lower sides of the passages I, the edges of the gutters preventing the direct access of the steam to the channels. The gutters are supported upon the angle-irons I' by bolts *k* and collars *k'*. The collar *k'* at the right-hand side of Fig. 4 is shown in section, and the bolt *k* extended through the collar, the gutter J, and the plate K; but the gutter and the angle-iron I' only are shown in section at the left-hand side of Fig. 4.

A horizontal partition K, with small perforations *d*<sup>2</sup>, is extended longitudinally in the chamber above the floor D, and is shown supported by the same bolts *k* which support the gutter.

The passage I may be formed, as shown in the drawings, of two angle-irons I' or of a suitable casting, held in place by angle-bars *i*, which also unite the top of the dry-pipe with the plates F. The rolled beams F, the top of the dry-pipe or cover F<sup>2</sup>, the angle-irons I', and the partition K are all of them longitudinal strips adapted to pass through the manhole of a steam-drum, and the floor D is similarly constituted by making the bottom of the dry-pipe, which is unperforated, separate from the side plates D', in which the holes *d* are formed, such partitions being supported upon angle-irons *d'*, which join the bottom of the dry-pipe to the plate F.

A guard-plate L is provided below the bottom of the dry-pipe, to which it is attached by angle-irons *l*, and is projected outward to the middle line of the perforated plates D',



thus intercepting any water which may rise from the middle portion of the boiler toward such plates. The guard L is shown divided at the middle of its length, with the two parts  
5 united by a joint strip L', to facilitate the introduction of the guard through the manhole.

A perforated bridge M is cast or otherwise fixed in the thimble G', and the bolts *m* are  
10 extended from the same through the plate D and serve to support the entire steam-extracting devices.

The plates F exclude the admission of vapor to the dry-pipe at either end as well as to the space above the passage I, and the vapor is  
15 therefore compelled to pass through the perforations in the plates D' and K to reach the passage I, which is fully shown by the arrows *n* in the drawings. The interior of the dry-pipe is provided with baffle-plates *o* and *o'*,  
20 projected, respectively, from the floor D and the top F<sup>2</sup>, and the steam which enters the opposite ends of the dry-pipe by passages H is thus forced through a tortuous path, as indicated by the arrows *n'*, before it is dis-  
25 charged from the nozzle G.

The water is separated from the steam in its upward movement by the outer edges of the guard L and by the outer edges of the gutters J, as well as by the lower edges of the  
30 angle-irons I', which form the passages I. Such obstructions, with the perforations in the plates D and K and the baffle-plates within the dry-pipe, effectively separate all the water from the steam and deliver the latter  
35 to the outlet G' in a perfectly dry condition.

The entire device is shown attached together by removable bolts *s* and *k*, and the parts may thus be secured together after their  
40 introduction through the manhole and finally suspended from the bridge M by the bolts *m*. When thus secured in place, I have found that there is sufficient leakage at all the joints to dispose of the water which is separated from the steam without providing any tubes  
45 or channels for such water. The water separated from the steam in the passage I is, however, caught in the gutter J and carried to the ends of the dry-pipe where it leaks downward and avoids being carried upward by the move-  
50 ment of the steam through the plate K.

The downwardly-projecting plates *o* within the square box are formed with gutters *o*<sup>2</sup> at their lower edges, and any water separated from the steam by such plates is led sidewise,  
55 where it flows downward on the floor D with the water separated by the baffle-plates *o'*, and such water afterward escapes by leakage between the sides F' and the floor D.

The whole device is exceedingly cheap, as  
60 it is made of rough iron plates cut to length and perforated where necessary, and is perfectly adapted to separate the water from the steam.

Having thus set forth the nature of my in-  
65 vention, what I claim herein is—

1. A steam-extractor for a steam-drum, comprising a dry-pipe sustained within the

top of the drum, and provided with a suitable outlet to the steam-thimble and with aper-  
70 tures in its upper side near the end, the perforated plates D' connecting the bottom of the dry-pipe with the walls of the drum, and segmental end plates F forming a closed chamber about the pipe, as and for the purpose set forth. 75

2. A steam-extractor for a steam-drum, comprising a dry-pipe sustained within the top of the drum and provided with suitable outlet to the steam-thimble, and with steam-  
80 inlet apertures near its end, perforated plates D' connecting the bottom of the dry-pipe with the walls of the drum, segmental end plates F forming a closed chamber about the dry-pipe, and perforated partitions K sus-  
85 tained within such chamber above the plates D', as and for the purpose set forth.

3. A steam-extractor for a steam-drum, comprising a dry-pipe sustained within the top of the drum and provided with suitable outlet to the steam-thimble, and with steam-  
90 inlet apertures near its ends, perforated plates D' connecting the bottom of the dry-pipe with the walls of the drums, segmental end plates F forming a closed chamber about the dry-pipe, the extension from the top of the dry-  
95 pipe to the shell of the drum with longitudinal passages I formed through the same, the gutters J sustained below such passages, and the perforated partitions K affixed below the gutters, the whole arranged and operated  
100 substantially as herein set forth.

4. A steam-extractor for a steam-drum, comprising a dry-pipe sustained within the top of the drum, and provided with a suitable outlet to the steam-thimble and with aper-  
105 tures in its upper side near the end, perforated plates D' connecting the bottom of the dry-pipe with the walls of the drum, and segmental end plates F forming a closed chamber about the pipe, and a guard L sustained  
110 below the floor D, D', to shield a portion of the perforations in the plates D', substantially as herein set forth.

5. A steam-extractor for a steam-drum, adapted for insertion through the manhole,  
115 and consisting of the segmental plates F provided with angle-irons *i* and *d'*, the plates D and the perforated plates D' supported upon the irons *d'*, the rolled beams F', with cover F<sup>2</sup> having the holes H at the ends, and at-  
120 tached to the angles *i*, and the angle-irons I' attached to the angles *i* and forming passages I with gutters J sustained below the same, and the top F<sup>2</sup> being provided with nozzle G fitted to the steam-thimble G', and the whole  
125 secured together by the detachable bolts *s* and *k*, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN J. HOGAN.

Witnesses:

L. LEE,  
EDW. F. KINSEY.