

No. 671,989.

Patented Apr. 16, 1901.

S. E. & A. J. DIESCHER.
FEED MECHANISM FOR FURNACES.

(No Model.)

(Application filed Mar. 1, 1900.)

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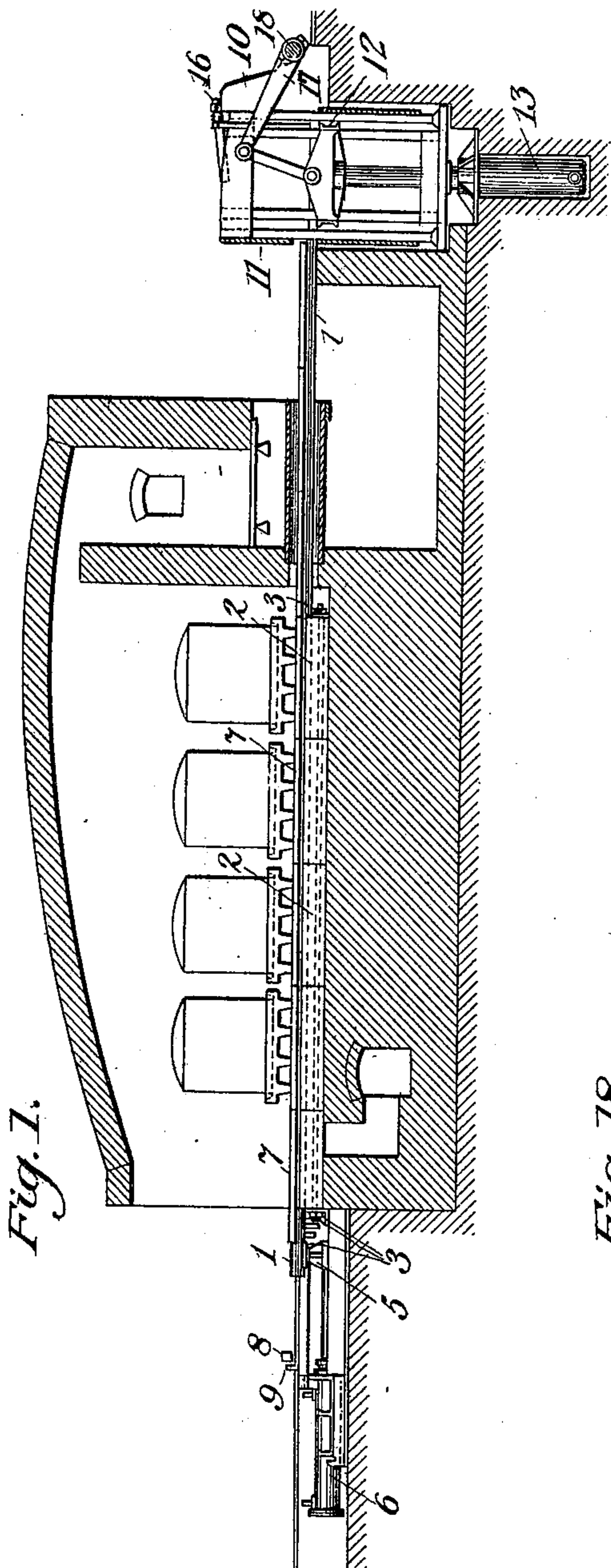
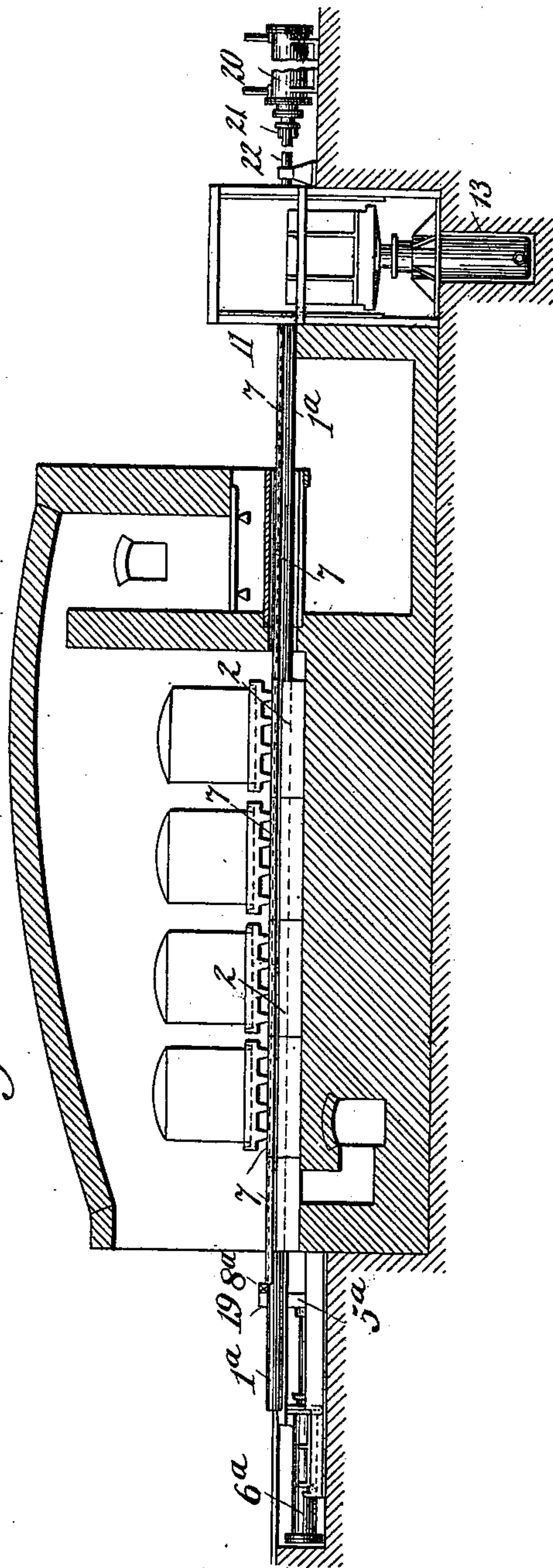


Fig. 18.



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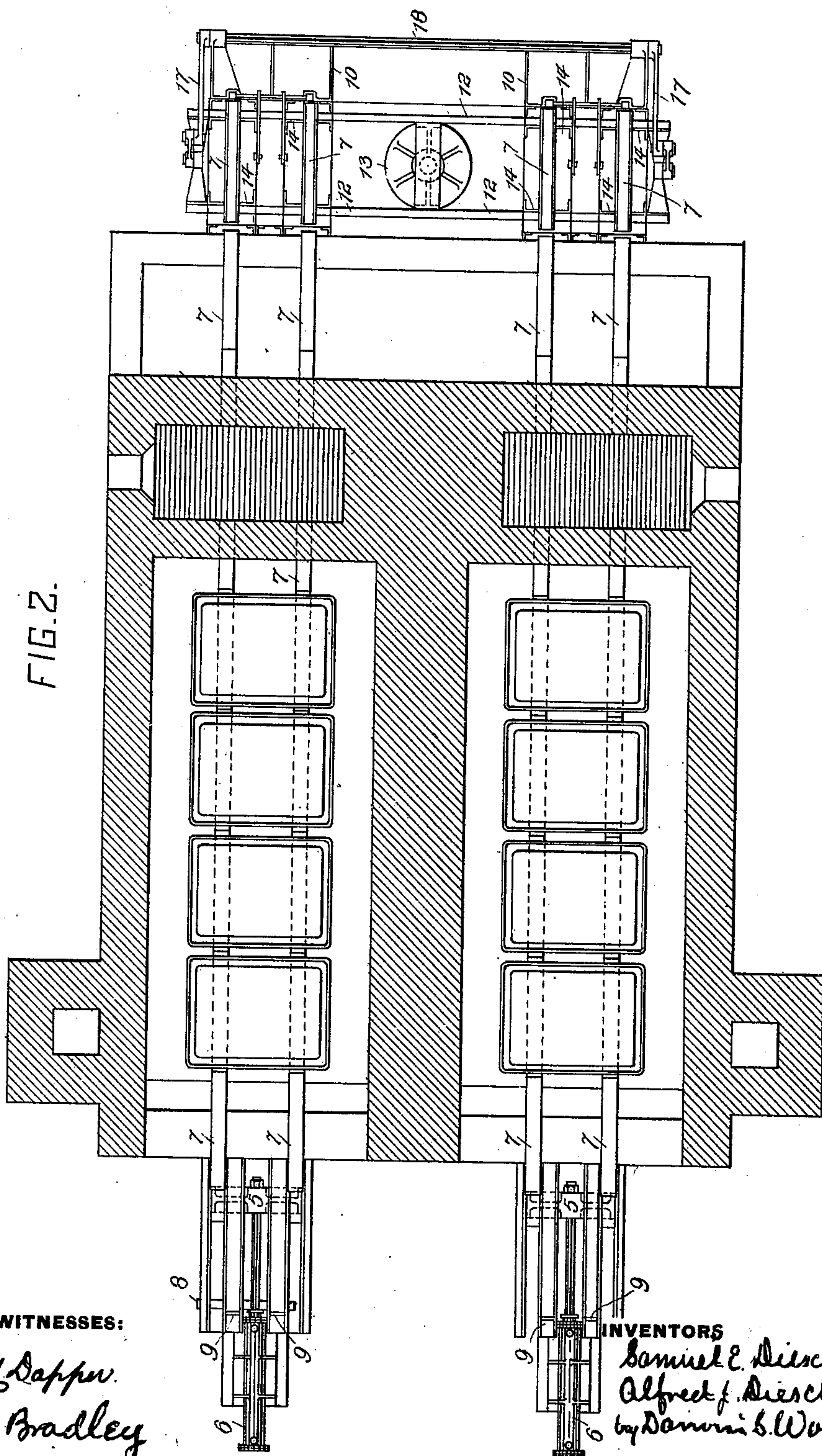
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FIG. 3.

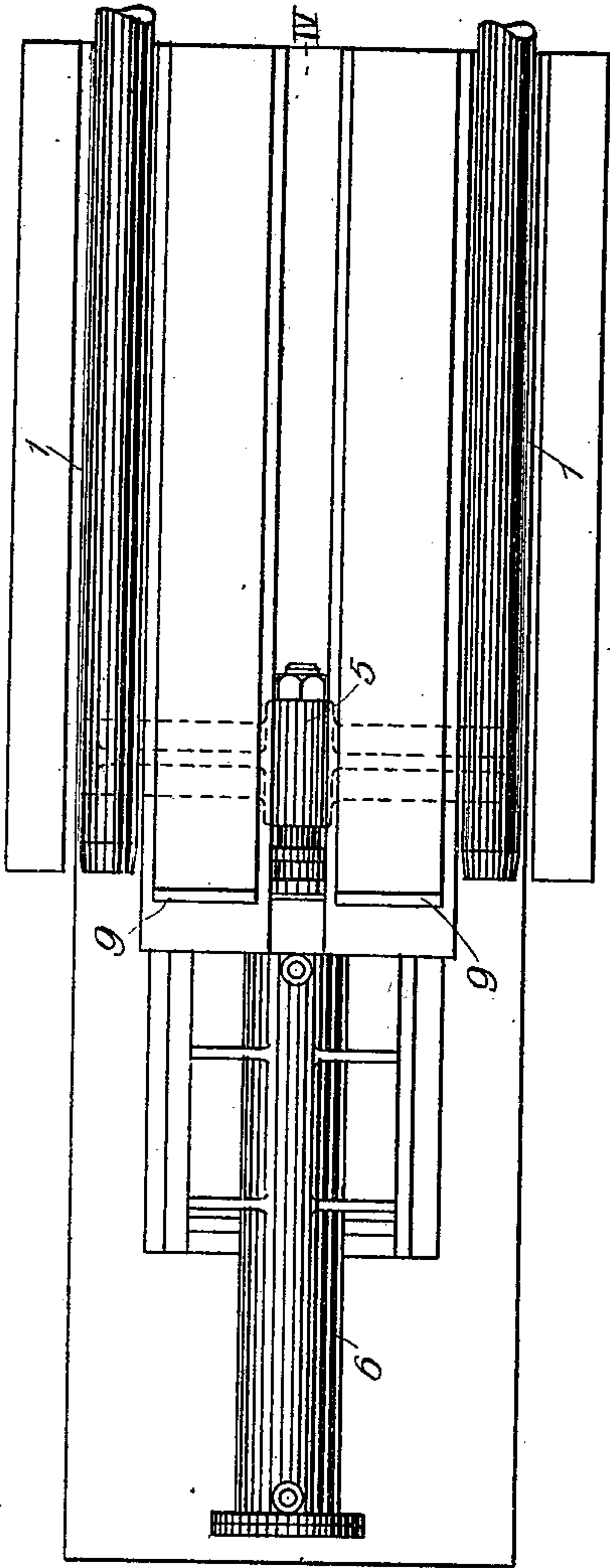


FIG. 4.

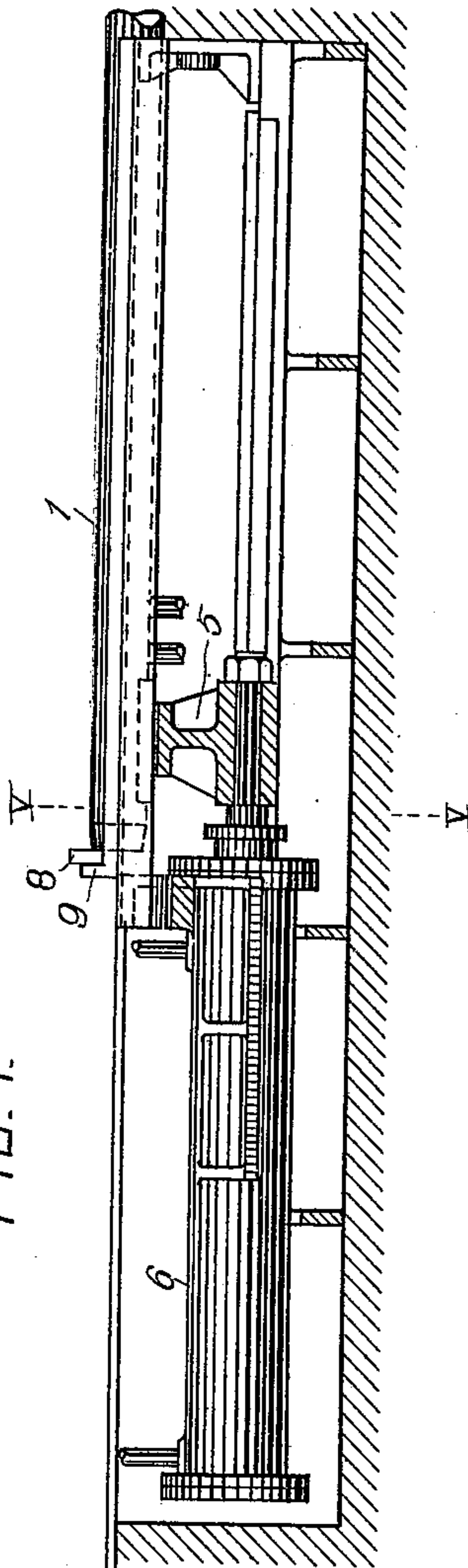


Fig. 17.



Fig. 15.



Fig. 16.

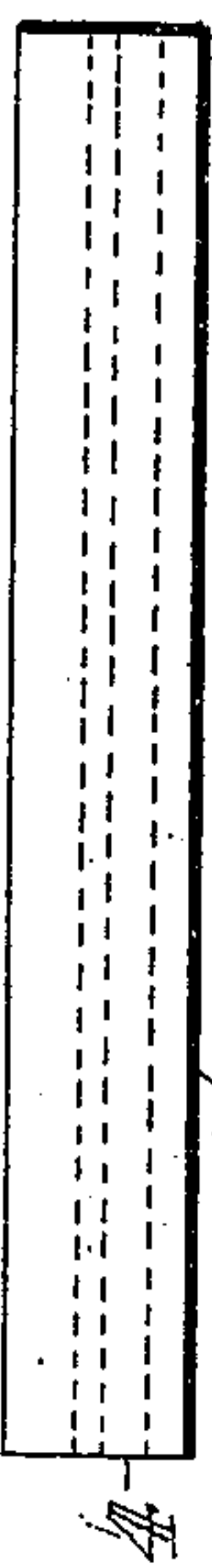
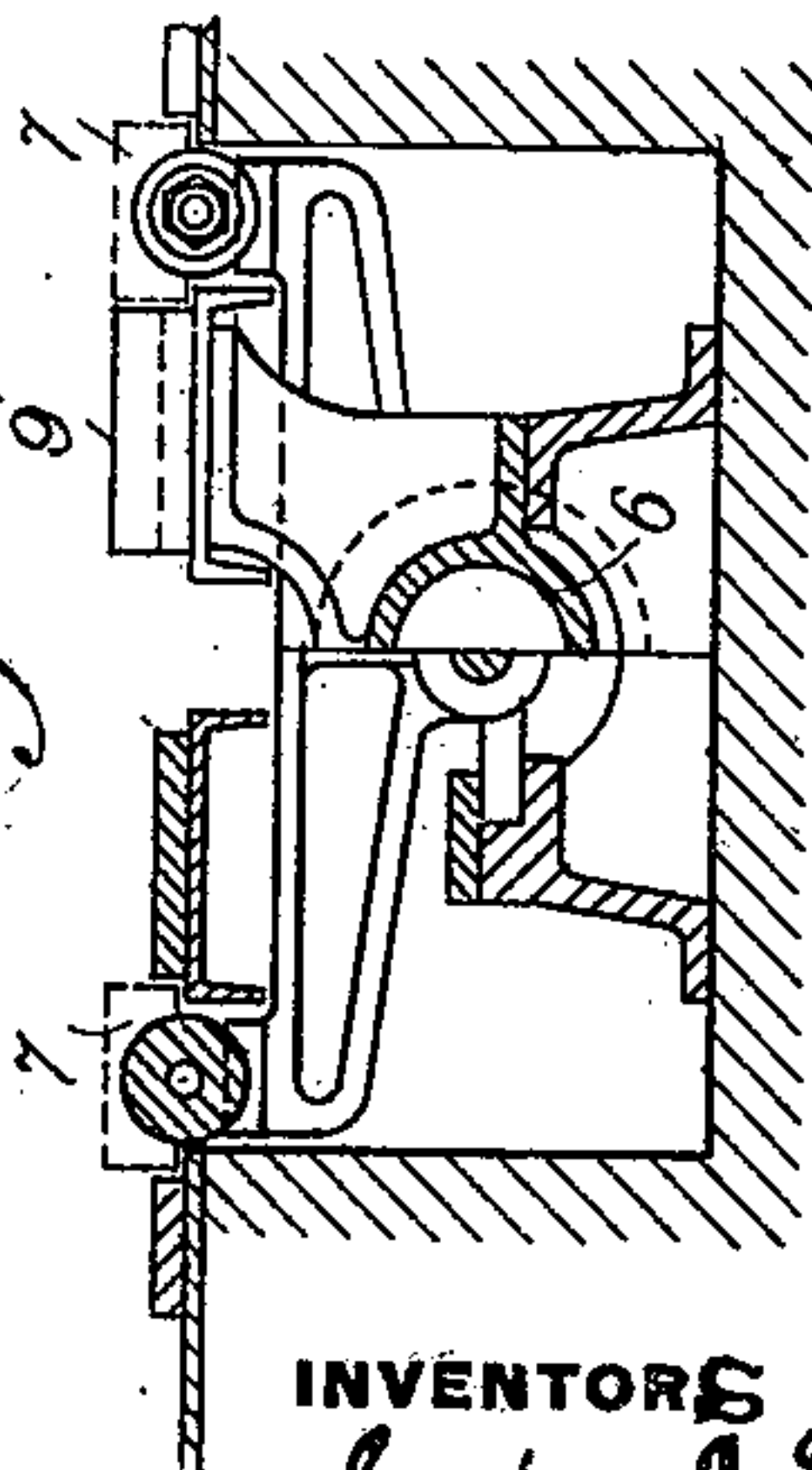


Fig. 5.



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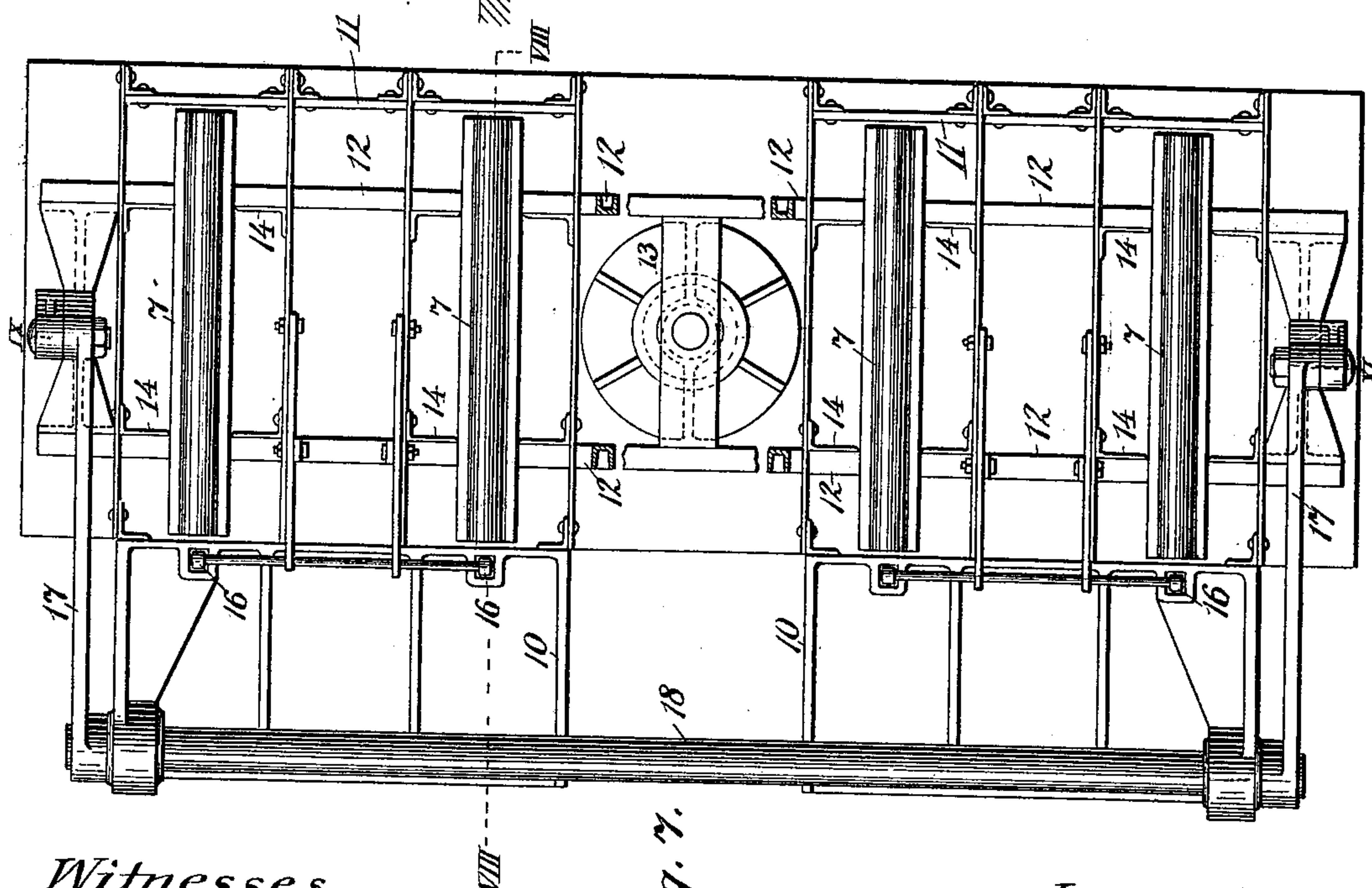
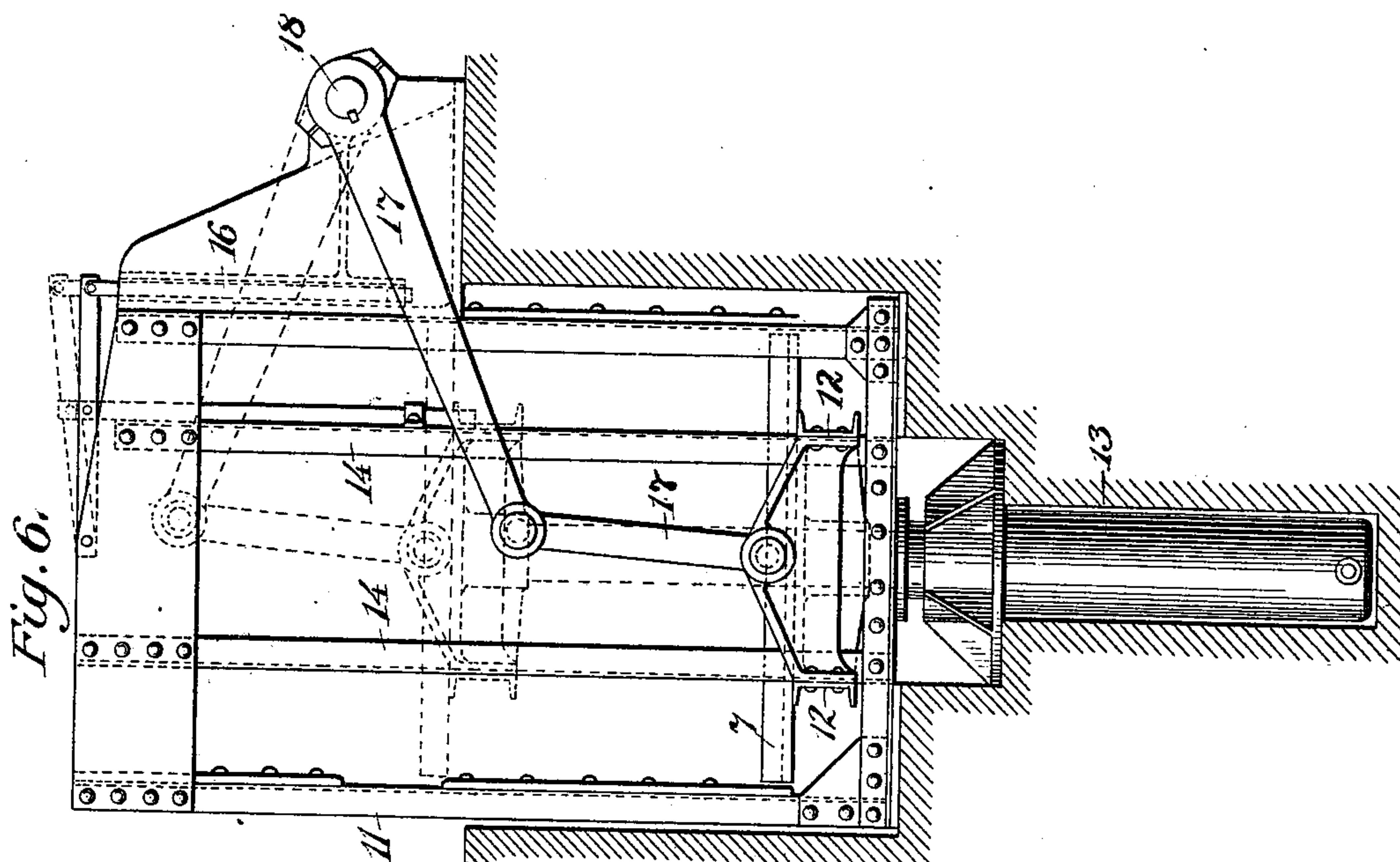
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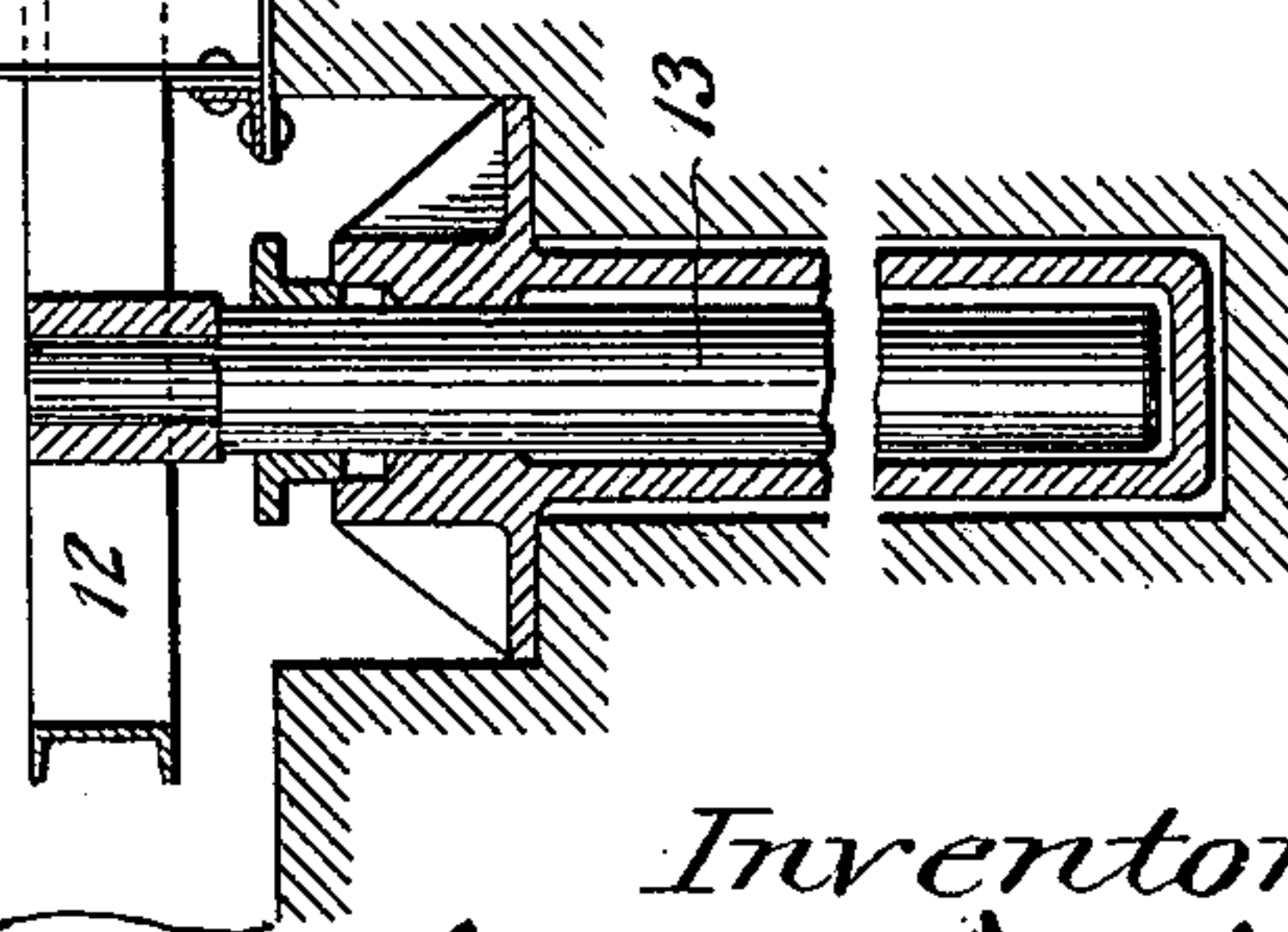
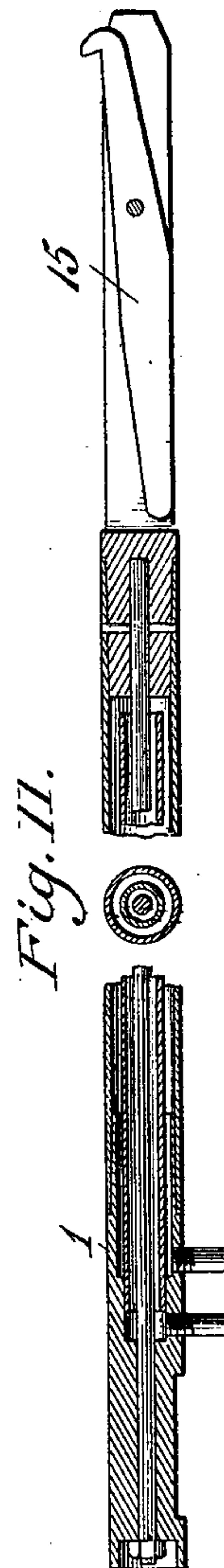
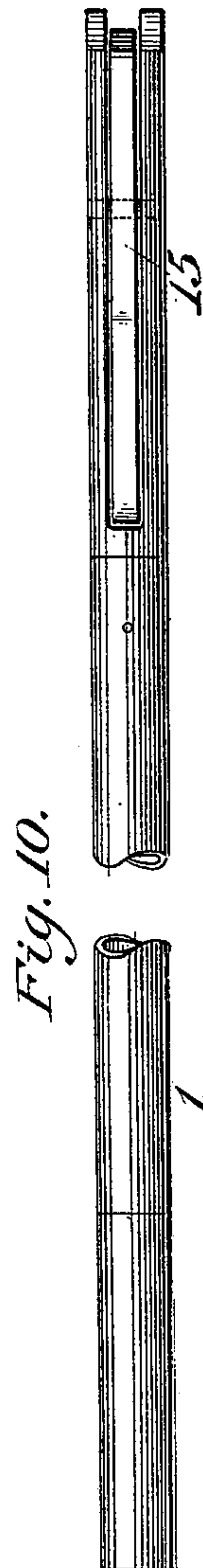
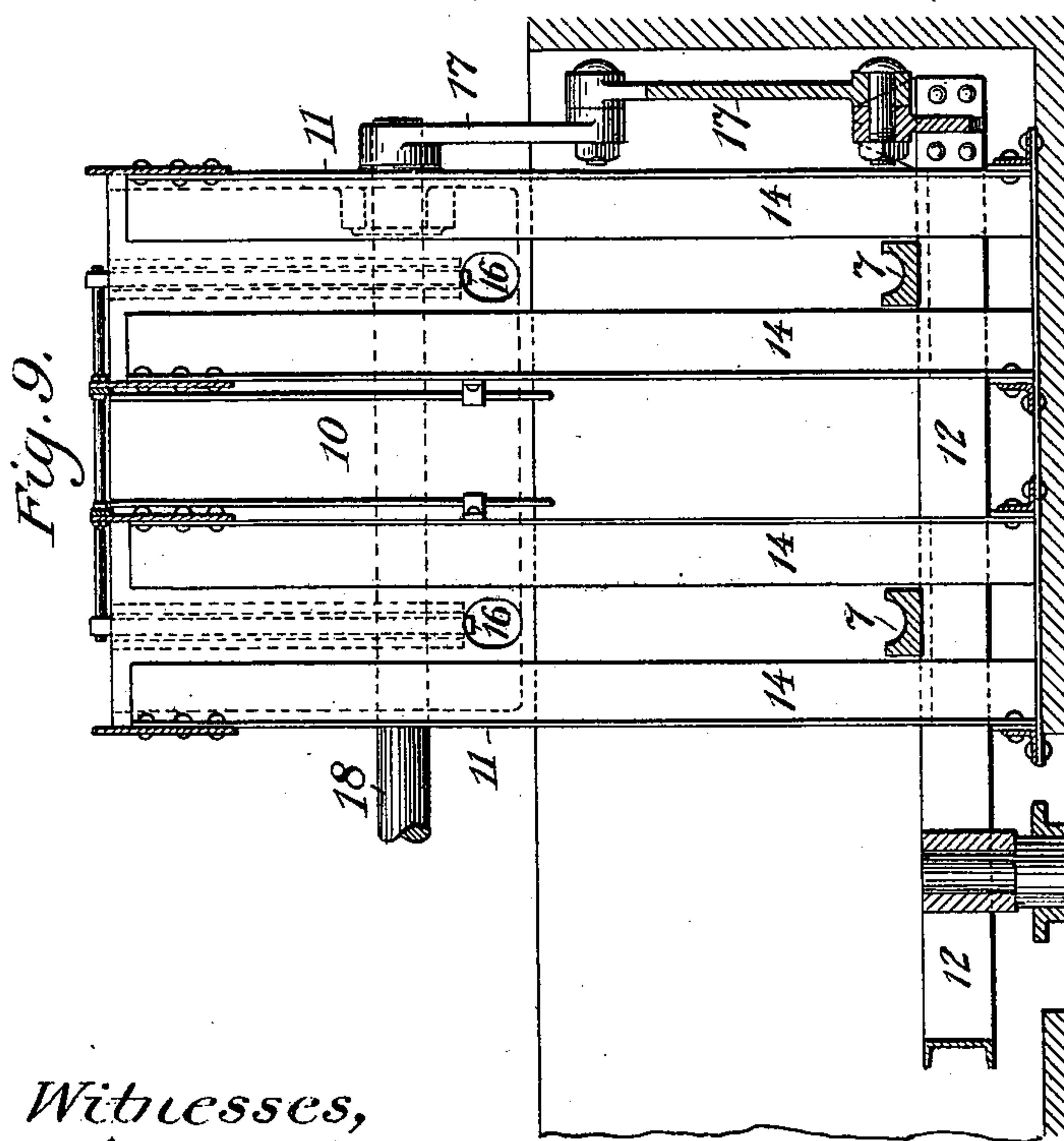
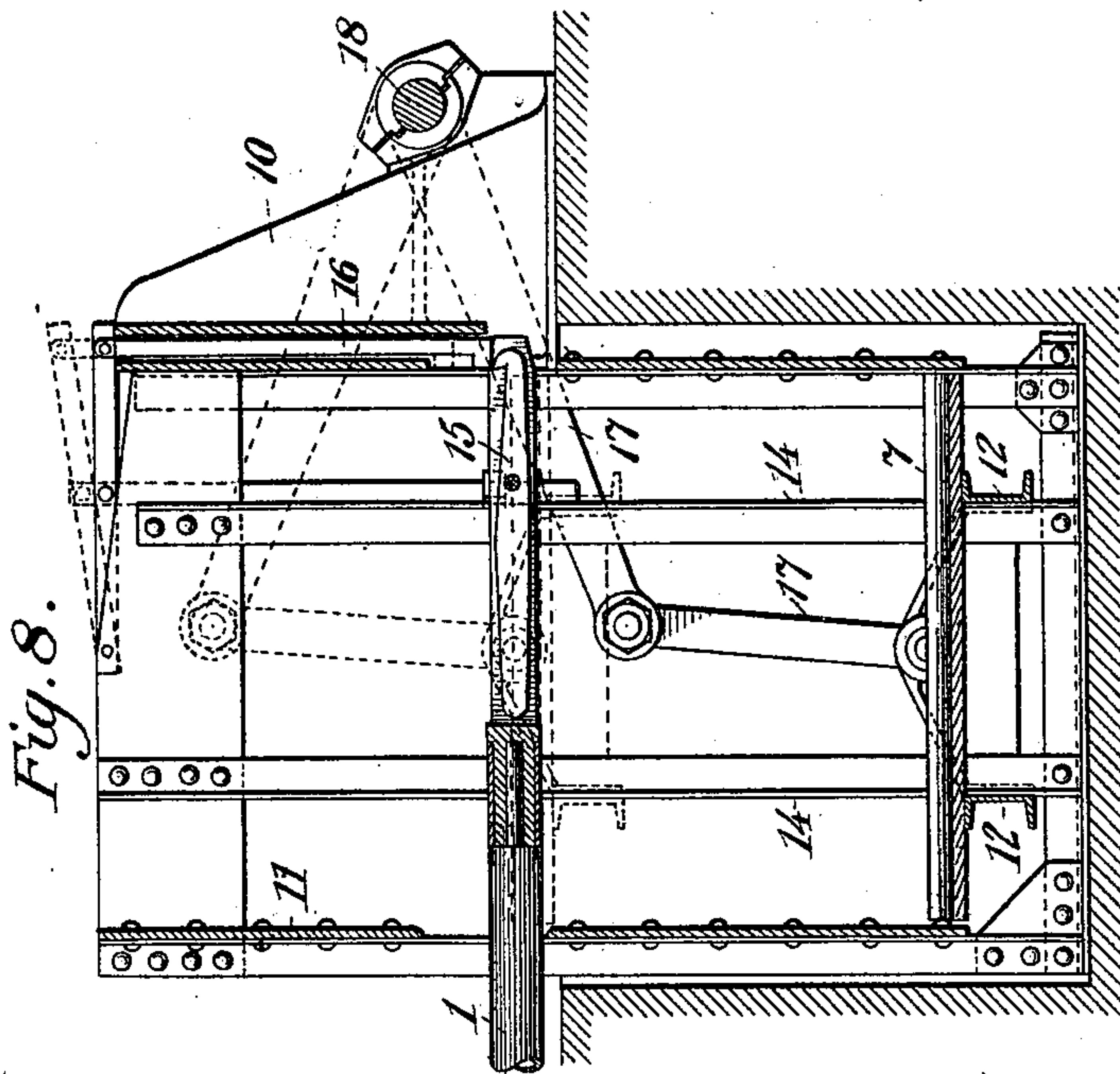
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FIG. 19.

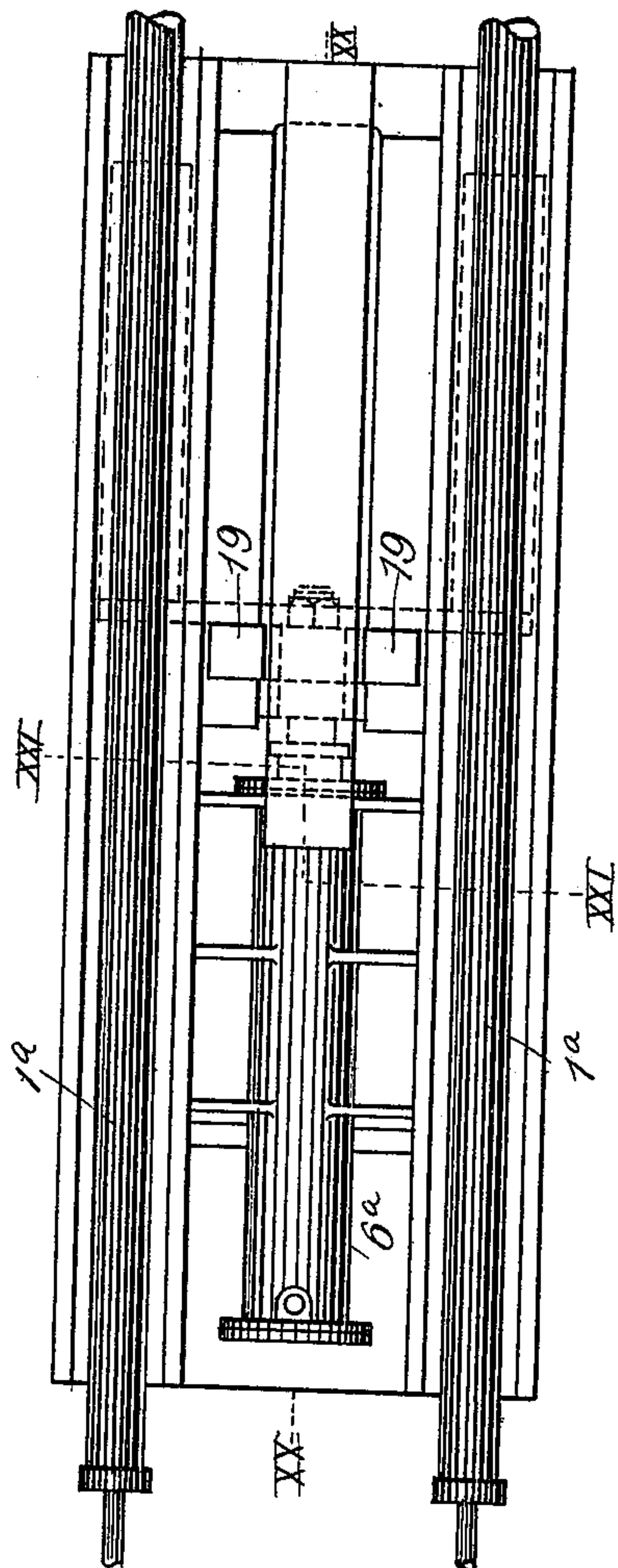


Fig. 12.

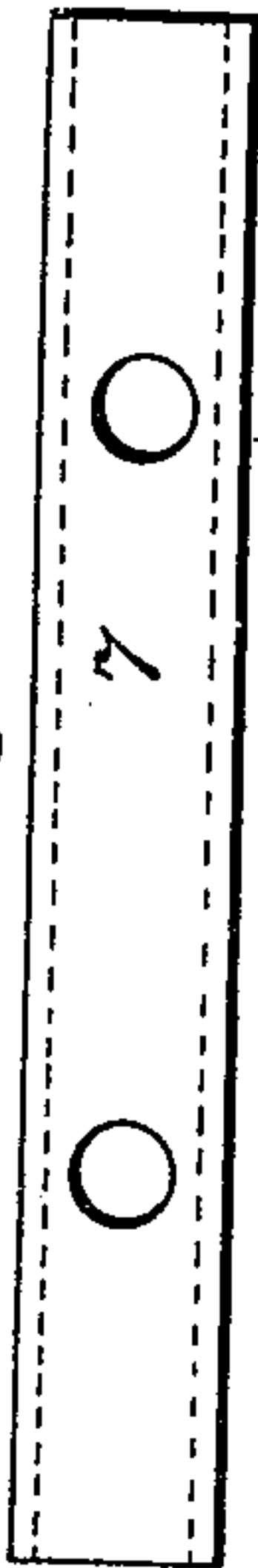


Fig. 13.

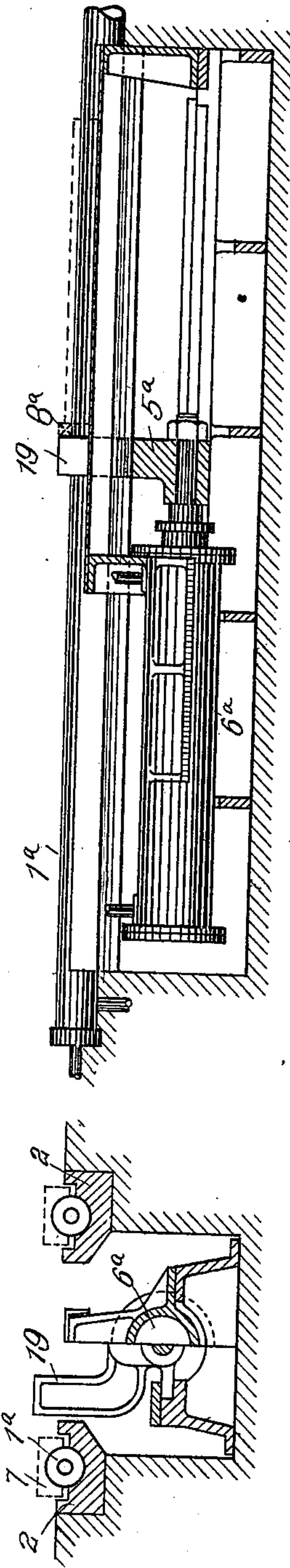


Fig. 14.



FIG. 21.

FIG. 20.



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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 671,989, dated April 16, 1901.

Application filed March 1, 1900. Serial No. 6,908. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL E. DIESCHER and ALFRED J. DIESCHER, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Feed Mechanisms for Furnaces, of which improvements the following is a specification.

The invention described herein relates to certain improvements in mechanism for shifting articles into and from furnaces, said improvements being especially applicable to the charging and discharging of annealing-furnaces.

The invention has for its object a construction whereby charging and discharging of articles into and from a furnace may be effected by the shifting of a series of movable shoes or carrier-blocks; and it is a further object of the invention to provide a construction whereby limited back-and-forth movements of the supporting pipe or rail may be utilized for shifting the annealing-pot or other article into and out of the furnace.

In general terms the invention consists in the employment of a series of shoes or carrier-blocks with suitable shifting mechanism, such as a reciprocating supporting pipe or rail, for shifting the pots or other articles.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of an annealing-furnace having our improved feed mechanism applied thereto. Fig. 2 is a plan view, the furnace being shown in section. Fig. 3 is a plan view, on an enlarged scale, of the front or power end of the feed mechanism. Fig. 4 is a sectional elevation of the same, the plane of section being indicated by the line IV IV, Fig. 3. Fig. 5 is a transverse section on a plane indicated by the line V V, Fig. 4. Fig. 6 is an end elevation, on an enlarged scale, of the shoe or carrier magazine. Fig. 7 is a top plan view of the same. Figs. 8 and 9 are vertical sections of the magazine, the planes of section being indicated, respectively, by the lines VIII VIII and IX IX, Fig. 7. Figs. 10 and 11 are plan and sectional views of the rear portion of the supporting pipe or rail. Figs. 12, 13, and 14 are plan, sectional, and

end views, respectively, of one form of shoe or carrier. Figs. 15, 16, and 17 are top and bottom plans and end elevation, respectively, of the blocks for supporting the pipes or rails. Fig. 18 is a sectional elevation of a furnace and a modified form of charging and discharging mechanism. Fig. 19 is a plan view, on an enlarged scale, of the mechanism at the front end of the furnace. Fig. 20 is a sectional elevation of the same, the plane of section being indicated by the line XX XX, Fig. 19; and Fig. 21 shows transverse sections on planes indicated by line XXI XXI, Fig. 19.

While the invention is shown as applied to an annealing-furnace, it can be applied as readily to furnaces for other purposes, and hence the scope of the claims is not limited to any particular form or construction of furnace.

In the practice of our invention the supporting pipes or rails 1, which are made of sufficient length to extend not only entirely through the furnace, but also a suitable distance beyond each end, are arranged in grooved supports 2. These grooved supports are preferably formed in sections, which are held together and tied to the front of the furnace by rods 3, passing through holes 4, formed in the sections, as shown in Figs. 1, 15, 16, and 17. At one end the pipes or rails are secured to a cross-head 5, which in turn is attached to the piston-rod of a fluid-pressure cylinder 6, whereby the desired longitudinal movement may be given to the pipes or rails. When the annealing-pots or other articles are to be charged into the furnace, shoes or carriers 7, which are grooved on their under sides, are placed on the rails, the latter having been drawn out so that their front ends project a suitable distance out of the furnace. The pot or other article is then placed on the shoes and the rails pushed in, carrying with them the shoes and pot. If the longitudinal movement of the rails has not shifted the pot a sufficient distance into the furnace or it is desired to charge another pot, other shoes are placed on the rails and the latter drawn to the front, the shoes being held from outward movement with the rails by a suitable stop or abutment. This stop

or abutment can be conveniently formed by placing a bar 8 between shoes or blocks last placed in position and the shoulders 9 formed on or secured to the fluid-pressure cylinder 5 or its supporting-frame, as shown in Figs. 1, 2, 3, 4, and 5. After the rails have been drawn out under the second pair of shoes the rails are again moved inward, carrying both pairs of shoes and any article resting thereon. These operations are continued until the furnace is fully charged or the pot or pots have reached the desired position therein.

For removing the pots from the furnace a reversal of the foregoing operation must be effected—that is to say, the shoes must move with the rails during the outward movements of the latter, and additional shoes must be interposed between the last shoes and suitable abutments 10 to prevent the shoes moving with the pipes or rails when they are shifted inward. These abutments are arranged a suitable distance in the rear of the furnace, as shown in Fig. 1, and a magazine from which the shoes can be moved to operative position is arranged in front of the abutments. This magazine consists of a frame 11, extending for a part of its length down into a pit in front of the abutments 10, to which the frame is secured. A lifting-platform, consisting of horizontal bars 12, is arranged within the pit, said bars being secured to a head on the ram of a fluid-pressure cylinder 13 or other lifting mechanism. In order to maintain the shoes in alinement with the pipes or rails 1, vertical guide-wings 14 are secured to the frame 11, as clearly shown in Figs. 6, 7, and 8.

When the furnace is charged, a number of the shoes or carriers will be arranged in two piles on the platform, the shoes being held in position laterally by the vertical wings 14. When the charge in the furnace is to be drawn, the platform is raised to interpose the top shoes of each pile on the platform between the abutments 10 and the strings of shoes extending along the pipes or rails from the rear shoe or carrier in the furnace to the magazine. The rails or pipes are then moved inwardly or to the right in Figs. 1 and 2, the string of shoes on the pipes or rails being held stationary, so that the rear ends of the pipes or rails will pass under and beyond the shoes bearing against the abutment sufficiently far to permit the hooks 15 on the pipes or rails to engage the rear ends of such shoes, as shown in Figs. 10 and 11. The rails 1 are moved out or to the left in Figs. 1 and 2, and by reason of the engagement of the hooks 15 with the last of the string of shoes there will be an outward movement of the furnace charge. The platform is again raised to bring other shoes into alinement with the strings on the rails, and the latter are again moved to the right, the rear ends thereof passing under the last shoes and the hooks engaging the same. The pots and the shoes on which they rest can be removed from the rails as

soon as they are moved out of the furnace, or the feed movement described can be utilized to push the shoes and pots out along the floor in front of the furnace. When the furnace is again charged, the shoes which have been placed on the rails to effect the outward or discharging movement must be removed and replaced in order in the magazine. Before the rails are moved to the left to begin the charging the platform is lowered into the pit, thereby permitting push-rods 16 to move down and press the hooks 15 down, so that they will not engage the shoes resting on the rear ends of the rails, which are then drawn out to the left. As the rails pass from under the rear shoes the latter will drop down onto the platform. When the rails are again moved to the right, another pair of shoes will be pushed into the magazine, and when the rails are drawn to the left this pair of shoes will drop into the magazine.

When our improved feed mechanism is applied to a double furnace or two furnaces arranged alongside of each other, as shown in Figs. 1 and 2, it is preferred to use a single lifting mechanism for raising and lowering the platforms of the magazine, such lifting mechanism being arranged intermediate of the magazines, and the bars forming the platforms extending from one magazine to the other. In order that the platforms may be kept level, the ends of the bars are connected, as shown, to rocker-arms 17, secured on the shaft 18, which is mounted in suitable bearings formed on or secured to the abutments 10.

If desired, the blocks or shoes may be moved in charging direction by a fluid-pressure cylinder 6^a, the rails or pipes 1^a being stationary, as shown in Figs. 18 to 21. In such case the cross-head 5^a is provided with arms 19, projecting above the rails or pipes to a level with the shoes or blocks resting on the rails. When two lines of rails are used, the arms 19 project up between them, and a bar 8^a is laid across the rails behind the arms, as indicated in dotted lines in Fig. 20. In charging shoes or blocks are placed on the rails behind the bar 8^a and a pot or other article placed on the shoes, which are then pushed into the furnace a distance equal to the stroke of the piston of the fluid-pressure cylinder. The cross-head and bar 8^a are then drawn back, and other blocks or shoes are placed behind the bar and forced into the furnace, pushing the other blocks ahead.

For removing the blocks and the articles carried thereby a fluid-pressure cylinder 20 is arranged in the rear of the shoe-magazine. The cross-head 21, which is secured to the piston-rod of the cylinder, is provided with arms 22, in line with the blocks or shoes on the rails. When the furnace is to be discharged, the platform in the magazine is raised to bring the shoes piled thereon when the furnace was charged into position, one by one, just above the level of the rails 1^a. The arms 22 are then moved forward, pushing a

pair of shoes out of the magazine onto the rails and shifting the series or lines of shoes along the rails toward the front of the furnace. The arms are then drawn back, another pair of shoes raised to charging position, and the arms again moved forward, pushing another pair of shoes out of the magazine and causing the two series of shoes to move another step toward the front of the furnace.

10 We claim herein as our invention—

1. As a means for charging and discharging furnaces, the combination of a series of independent carrier blocks or shoes adapted to carry the article to be heated and reciprocating mechanism for shifting said shoes or blocks step by step into and out of the furnace, substantially as set forth.

2. As a means for charging and discharging furnaces, the combination of a series of independent blocks or shoes adapted to carry the article to be heated, mechanism for shifting said shoes or blocks step by step into and out of the furnace and mechanism for moving the blocks into line with the shifting mechanism, substantially as set forth.

3. As a means for charging and discharging furnaces, the combination of a rail, a block or shoe supported by the pipe or rail, mechanism

for reciprocating the pipe or rail and means for holding the shoe or block stationary during the return movement of the pipe or rail, substantially as set forth.

4. As a means for charging and discharging furnaces, the combination of a rail, a series of blocks or shoes arranged on the pipe or rail, means for reciprocating the pipe or rail, and stops or abutments at the ends of the furnace for holding the blocks from movement with the rail or pipe, substantially as set forth.

5. As a means for charging and discharging furnaces, the combination of a rail, a series of blocks or shoes adapted to be shifted by the rail, means for reciprocating the pipe or rail, a magazine for the shoes or blocks arranged in the path of movement of the blocks and a catch on the pipe or rail adapted to engage and draw the shoes or blocks from the magazine, substantially as set forth.

In testimony whereof we have hereunto set our hands.

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