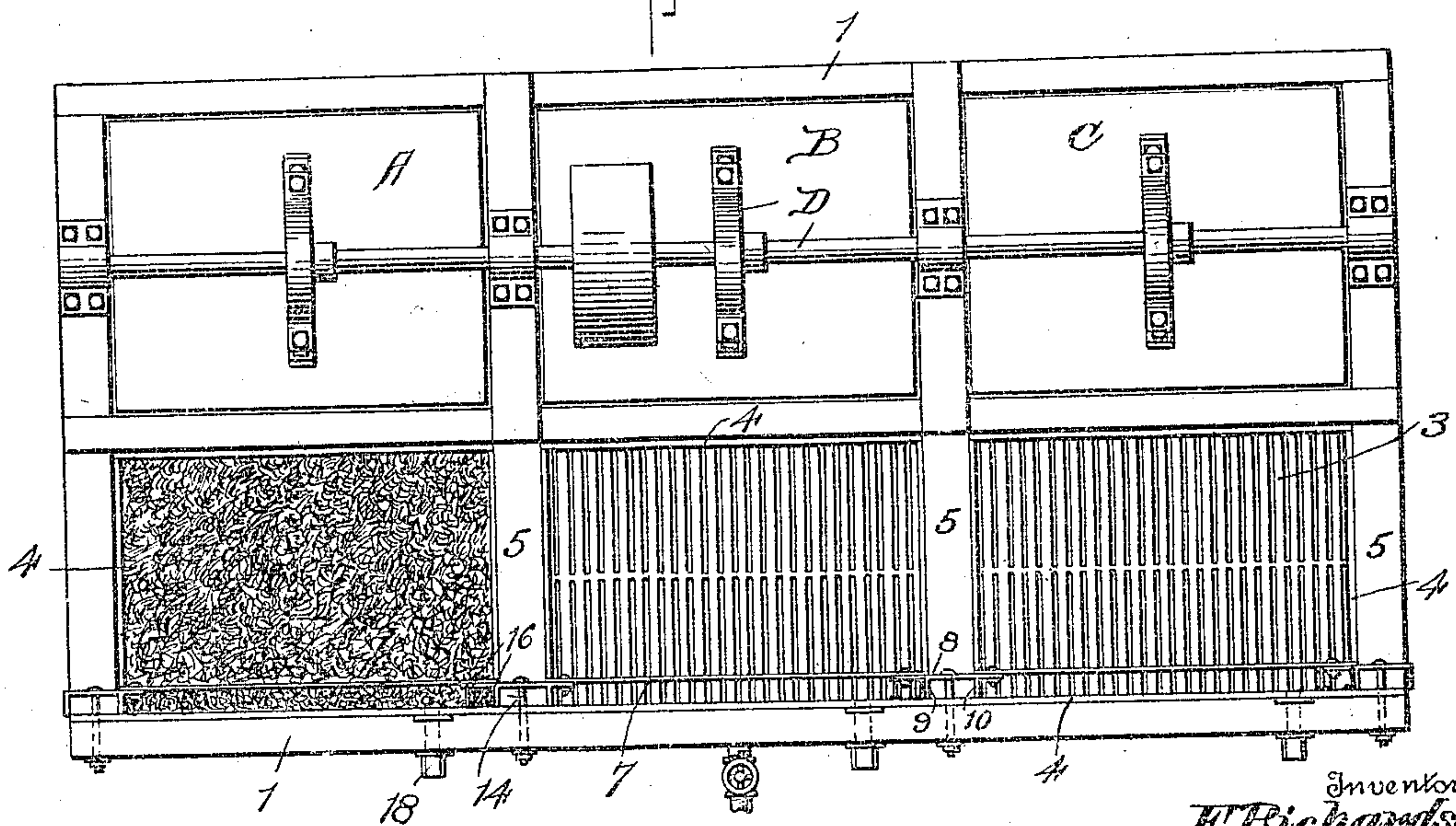
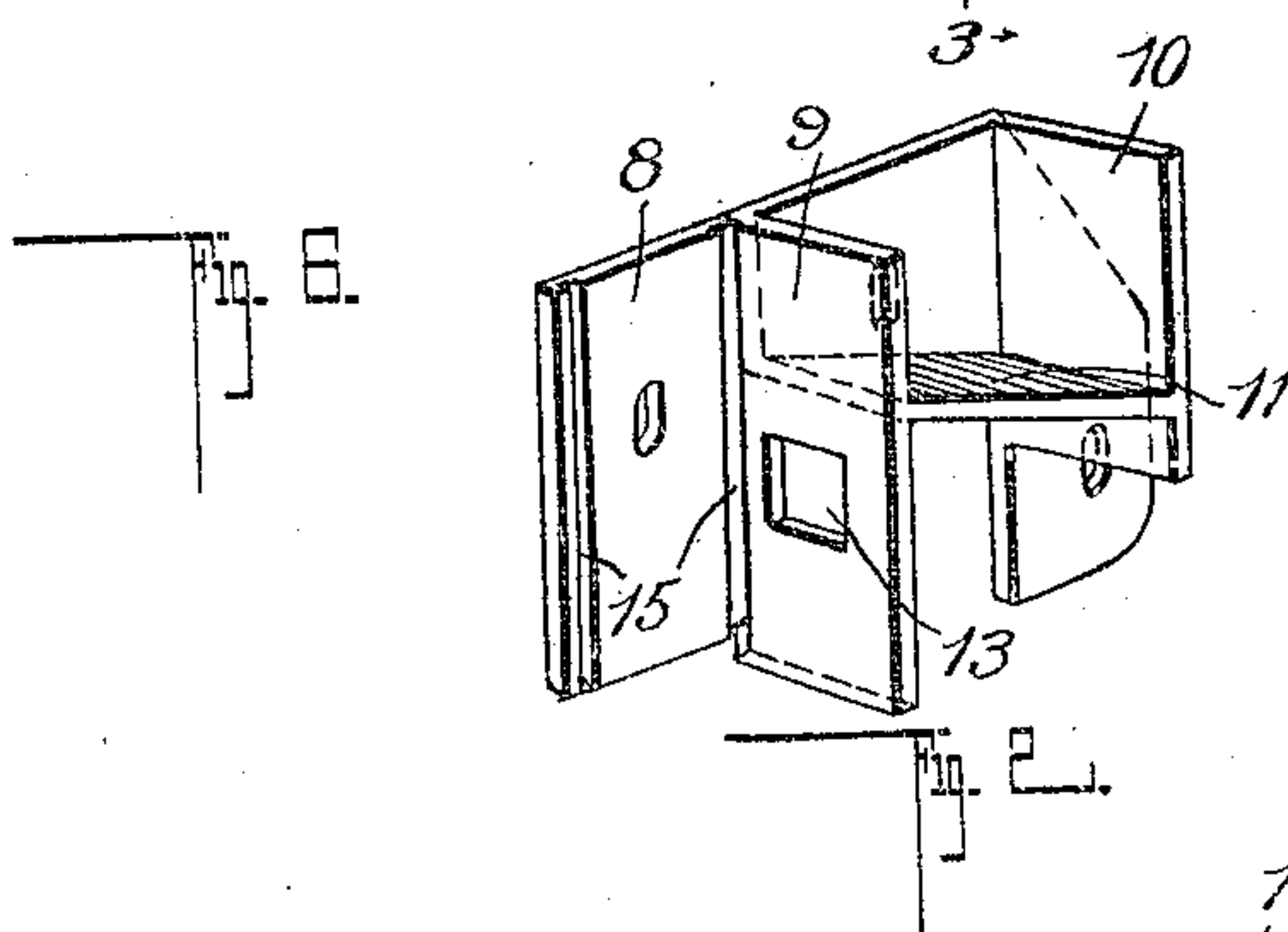
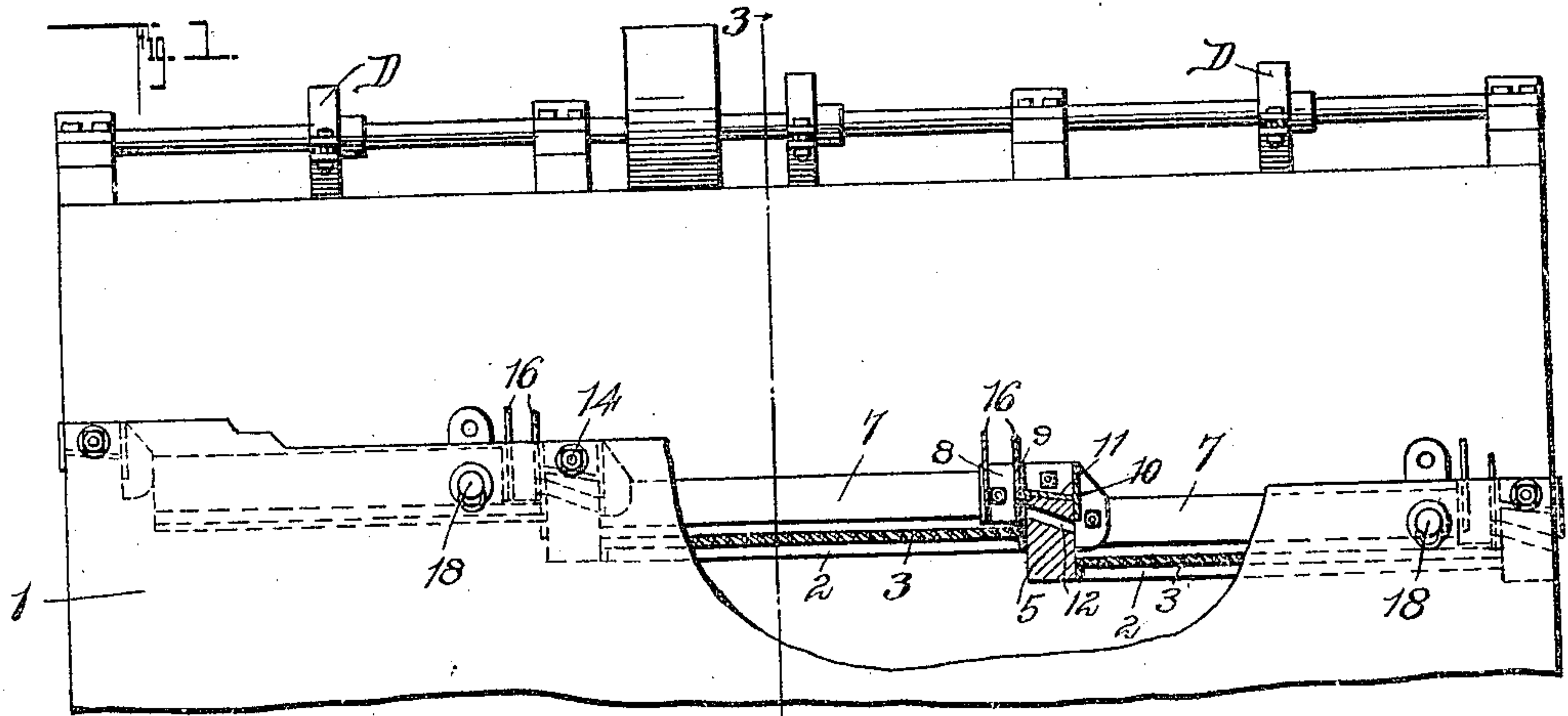


F. RICHARDSON.
GRAVITY JIG ATTACHMENT.
APPLICATION FILED SEPT. 23, 1909.

Patented May 31, 1910.

959,607.

2 SHEETS—SHEET 1.



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Witnesses

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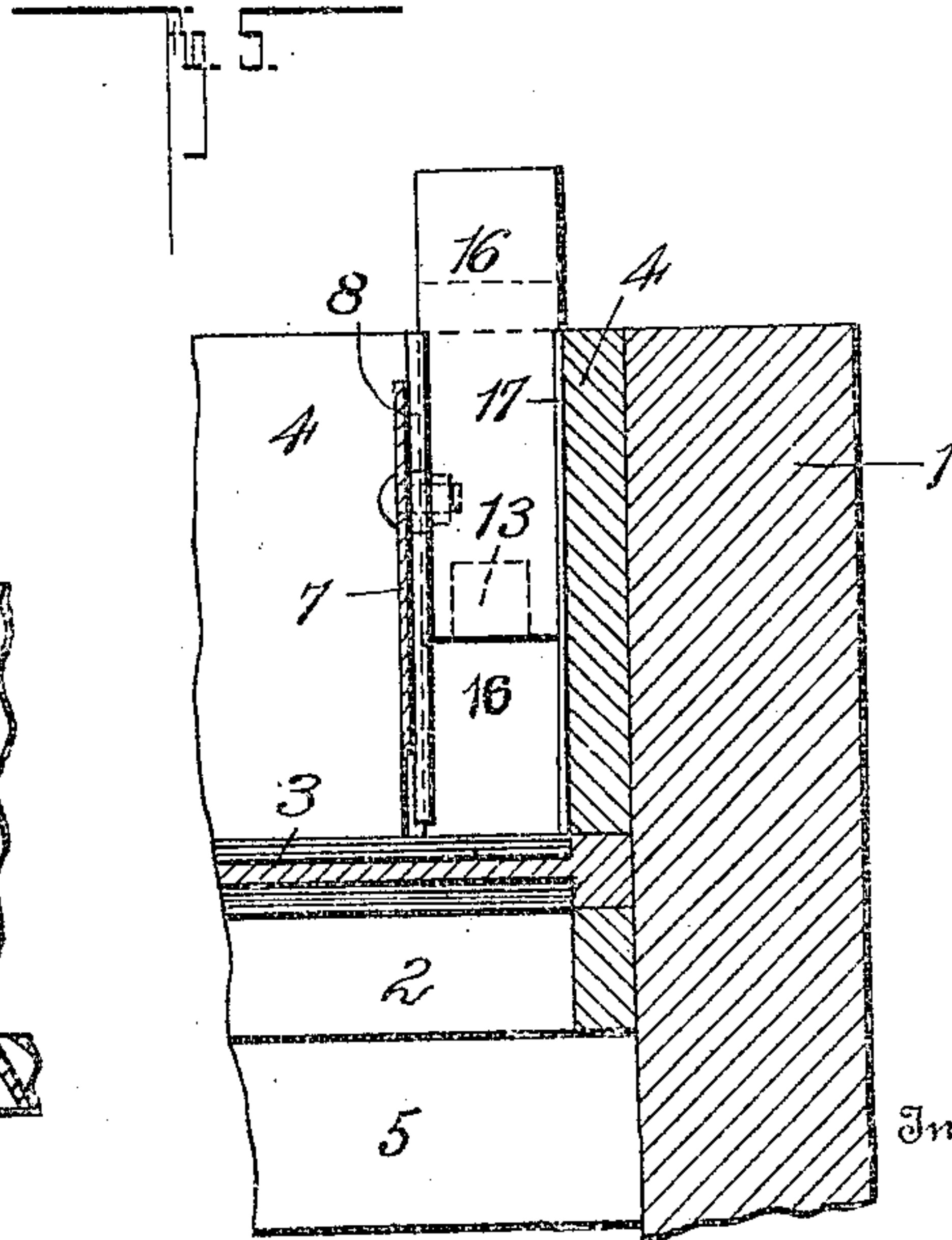
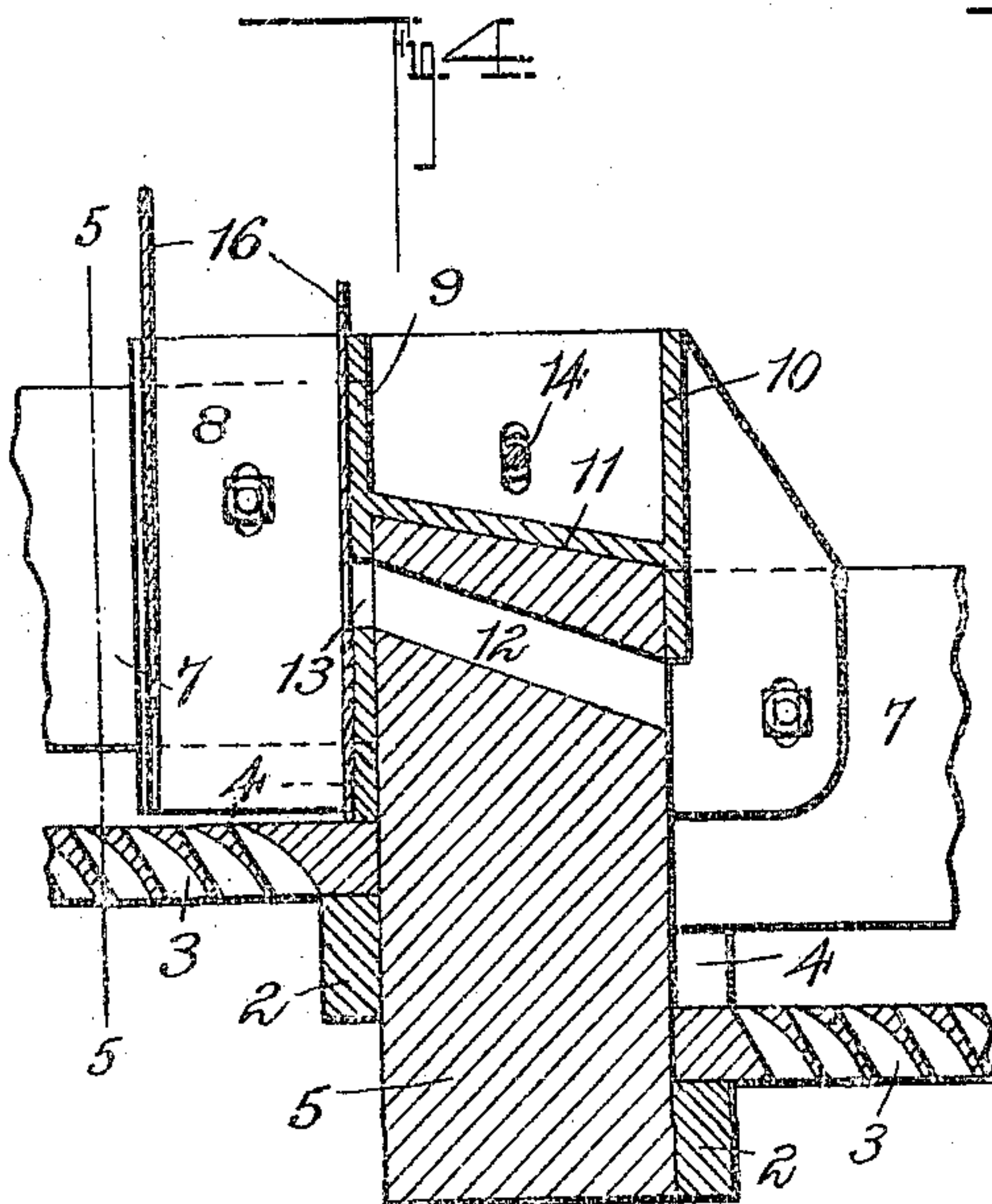
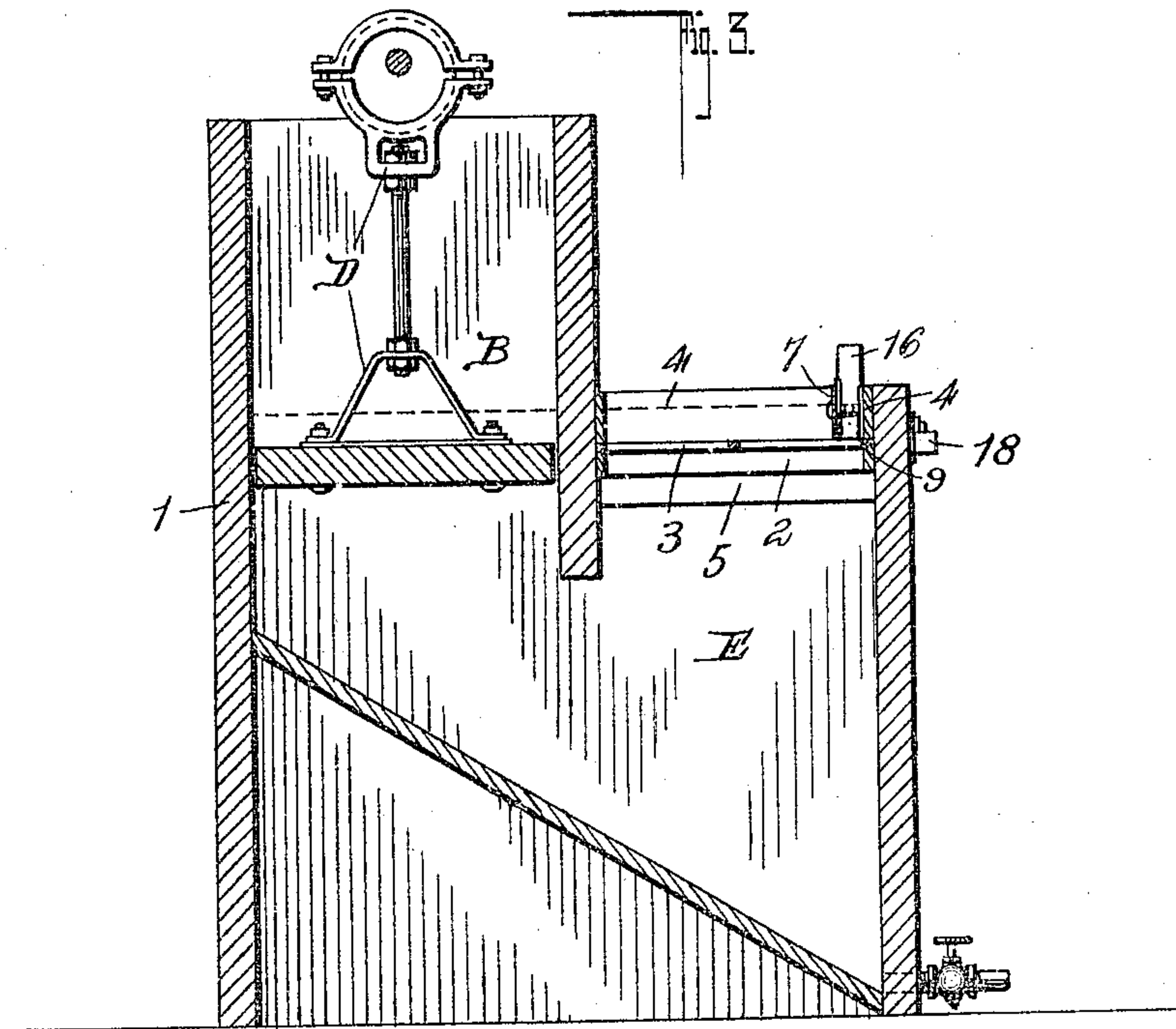
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRED RICHARDSON, OF WEBB CITY, MISSOURI.

GRAVITY-JIG ATTACHMENT.

959,607.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed September 23, 1909. Serial No. 519,167.

To all whom it may concern:

Be it known that I, FRED RICHARDSON, a citizen of the United States, residing at Webb City, in the county of Jasper and State of Missouri, have invented a new and useful Improvement in a Gravity-Jig Attachment, of which the following is a specification.

This invention relates to improvements in gravity jigs and the object of the invention is to save the chats, to withdraw them from one side of the jig in order that they can be again run through a crushing device and returned to the jig for further treatment.

A further object of the invention is to maintain upon the grates of the various cells a uniform bed of free ore, and to regulate the passage of the free ore and the chats from one cell to another.

A still further object of my invention is to construct a grate which will aid in obtaining the results mentioned above by imparting a backward or angular movement to the water in place of permitting a simple vertical movement, thereby aiding in securing a uniform distribution of free ore over the entire surface of the grate which is necessary in order to accomplish the best results and to keep a clear line of division between the free ore and the chats.

The jig to which my invention is applied is that of the type now commonly used, and in grinding or crushing the ore bearing rock, a portion of the ore will be entirely separated from the rock, thus forming free ore, and there will be portions of rock which either contain no ore or from which the ore has been entirely removed by the grinding or crushing process. But there will also be an intermediate body of rock which still carries a certain amount of ore which has not been broken loose from the rock in which it is embedded. These ore bearing rocks are termed "chats" and in running through a jig, the free ore will settle to the bottom, the chats will settle upon the free ore, those containing the largest percentage of ore coming directly upon the bed of free ore, and the lightest pieces of broken mass, which is rock containing no ore will be at the top. The line between the bed of free ore and the heaviest of the chats is termed the "chat line", and this line plays a very important part in using my invention.

The invention consists in forming along one side of the cells a series of narrow pas-

sageways through which the crushed or ground mass can move, the passageways being connected by connecting yokes and by suitable openings formed in cross partitions, said passageways being controlled by gates, and the longitudinal partitions which form the sides of the cells adjacent said passageways being adjustable vertically, so that free ore and chats can pass under said sides to and from the grates, suitable openings being formed in the sides of the jig by means of which the chats can be drawn from the longitudinal passageway at various points for regrinding.

In the accompanying drawings Figure 1 is a side elevation of a portion of a jig with my attachment applied thereto, parts being broken away, shown in section and parts being shown in dotted lines. Fig. 2 is a plan view of a three-cell jig with my invention applied thereto. Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 1. Fig. 4 is an enlarged detail longitudinal section through one of the connecting yokes. Fig. 5 is a section on the line 5—5 of Fig. 4. Fig. 6 is a detail perspective view of one of the connecting yokes.

In these drawings 1 represents a jig having cells A, B and C, although a larger number of cells can be employed if desired. D represents the water agitating means common to jigs of this kind and E the water space or tank of the jig. All of these parts are found in the gravity jigs now in operation in various sections of the country.

Each cell is provided with cleats 2 forming a rectangular frame upon which rest grates 3 which will be described in detail hereafter. Suitable linings 4 rest upon the marginal portions of the grates and serve to hold them in position. The cells are separated by heavy cross partitions 5 against which the end linings of the cells rest, and the cells are also provided with a longitudinal vertically adjustable partition 7. The partitions 7 extend from cross piece 5 to cross piece and are spaced a short distance from the front side of the jig, thus furnishing a narrow passageway along one side of each cell, communication being had between said passage and the main portion of the cell through the space between the bottom of the partitions 7 and the grate. In terming these partitions vertically adjustable, it is not intended to indicate that they work freely, but they are fastened in their ad-

justable positions so as to allow the necessary amount of space between their lower edges and the grate as may be found necessary by experience, and according to the nature of the ores being treated in the jig with which they are used. In some jigs these partitions may be set higher than in others, but once adjusted and put in place for ores of a certain grade, they will need little, if any readjustment. To connect the various passageways together and at the same time not weaken the partitions 5, I employ connecting yokes, one of which is shown in detail in Fig. 6. This yoke consists of a side plate 8 which carries at right angles to it two vertically arranged plates 9 and 10 connected together by an obliquely arranged web 11 which rests upon the cross piece 5 to which the yoke is applied, the plates 9 and 10 extending down opposite sides of the cross piece. The cross piece is provided with a suitably inclined bore 12, and the plate 9 is provided with a centrally arranged opening 13 which aligns with the upper end of the bore 12. The plate 10 terminates just above the lower end of the bore 12. The partitions 7 are bolted to the side plates 8 of these yokes, and the side plates are also bolted as shown at 14 to the front side of the jig. The plate 8 is provided in advance of the plate 9 with vertical grooves 15 which form guideways for gates 16, the opposite sides of the gates being guided by suitable lugs or vertically arranged ribs 17 formed on the front side linings 4. Suitable hand holes 18 are formed in the front side of the jig through which the chats can be drawn off.

The grates 3 are formed with bars running transversely across the cells, and said bars are set obliquely as shown most clearly in Fig. 4, the bars inclining downwardly and rearwardly and having straight rear faces and inwardly curved front faces. By means of this construction the water when agitated by the plungers instead of rising and falling vertically as in the ordinary grate, strikes the under-curved surface which offers a resistance to perpendicular vibrations of the body of water, and the water is therefore forced upwardly through the grate toward the front end of each cell, or in a direction opposite to that in which the body of ore would naturally travel. This brings the free ore and chats from piling up against the various cross partitions and finally passing over said partitions while the forward part of the cell had an insufficient ore bed formed in it. The piling up of the crushed material in this manner is common in the ordinary form of jig and greatly reduces the amount of finished out-put per day, and it would also partially defeat the object of my invention as in order to secure the full benefits from the construction above described a uniform bed of ore must be

maintained upon the grates with a clearly marked chat line.

In operating a jig provided with my attachment the partitions 7 are set for the chat line to be maintained, and suitable for the grade of ore being handled. When so set, these partitions will allow the free ore and the chats to pass under the partition and from the grate of the first or uppermost cell, it being understood that the grate of each cell is in a lower plane than that of the cell immediately preceding. The gates 16 are then set so as to extend to the bed of free ore. This will permit the free ore to pass beneath the connecting yoke into the ore passage running along the second cell, but will hold back the chats which are drawn off through the hand hole 18 and are reground. The free ore passing through the first cross piece will then pass under the second partition 7 and will spread uniformly over the grate in the second cell until the ore bed has reached such height that no additional ore can pass beneath the partition, and the remainder of the ore in the passage will then pass on down through the next yoke and cross piece into the passageway of the third cell and under the third partition 7 and cover the grate in said cell. The bed of chats will not keep the fine rock from going through the bed of light ore and through the grates so that it is necessary to keep some free ore in each cell to keep sand and small rock from going through. It will also be obvious that if when ore is run under the gates from the first cell there is already a bed of ore upon the grate of the second cell of a sufficient depth, the ore discharged into the passageway of the second cell will pass on to the third cell, and will spread out over the grate in the third cell, or if there should also be a sufficient bed of ore in all the cells the free ore would pass out at the lower end of the passage as finished product. It will also be obvious that the chats can be drawn from any cell in the same manner as above described from cell A.

In order to show the invention as clearly as possible, hoppers, supports and various other appliances used in connection with a gravity jig have been omitted.

What I claim is:

1. In a gravity jig having a plurality of cells, longitudinal partitions arranged adjacent one side of the jig thereby forming a passageway parallel to the cells, said partitions being elevated above the jig grate, gates controlling movement of material through said passageway, and connecting yokes, said yokes connecting one portion of said passageway with another, as and for the purpose set forth.

2. A gravity jig comprising a plurality of cells, said cells being in different horizontal planes, grates forming a bottom for each

cell, partitions arranged lengthwise in each cell and adjacent one side, the partitions being spaced from said grate, connecting yokes, said yokes connecting one cell with another and having openings alining with the passages formed between the partitions and the side of the jig, and vertically adjustable gates arranged at the forward ends of said yokes, and controlling movement of material through said passages.

3. A gravity jig having a plurality of cells and a passageway formed longitudinally upon one side of each cell, said passageways communicating, means for regulating the flow of free ore and chats from the jig cells into said passageway, means for permitting passage of the free ores from one passage to another and checking passage of the chats from one passage to another, and means whereby the chats accumulating in

each passage may be drawn therefrom through the side of the jig, as and for the purpose set forth.

4. A gravity jig having a plurality of cells in different horizontal planes and having passageways formed along one side of said cells, said passageways communicating, a grate arranged in each cell and adapted to force the water at an angle to the ore bed on said grate, the ore beds having limited communication with the said passageways, and vertically adjustable gates adapted to permit passage of free ore from one passageway to another but checking movement of chats from one passage to the other, as and for the purpose set forth.

FRED RICHARDSON.

Witnesses:

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J. T. SLAUGHTER.