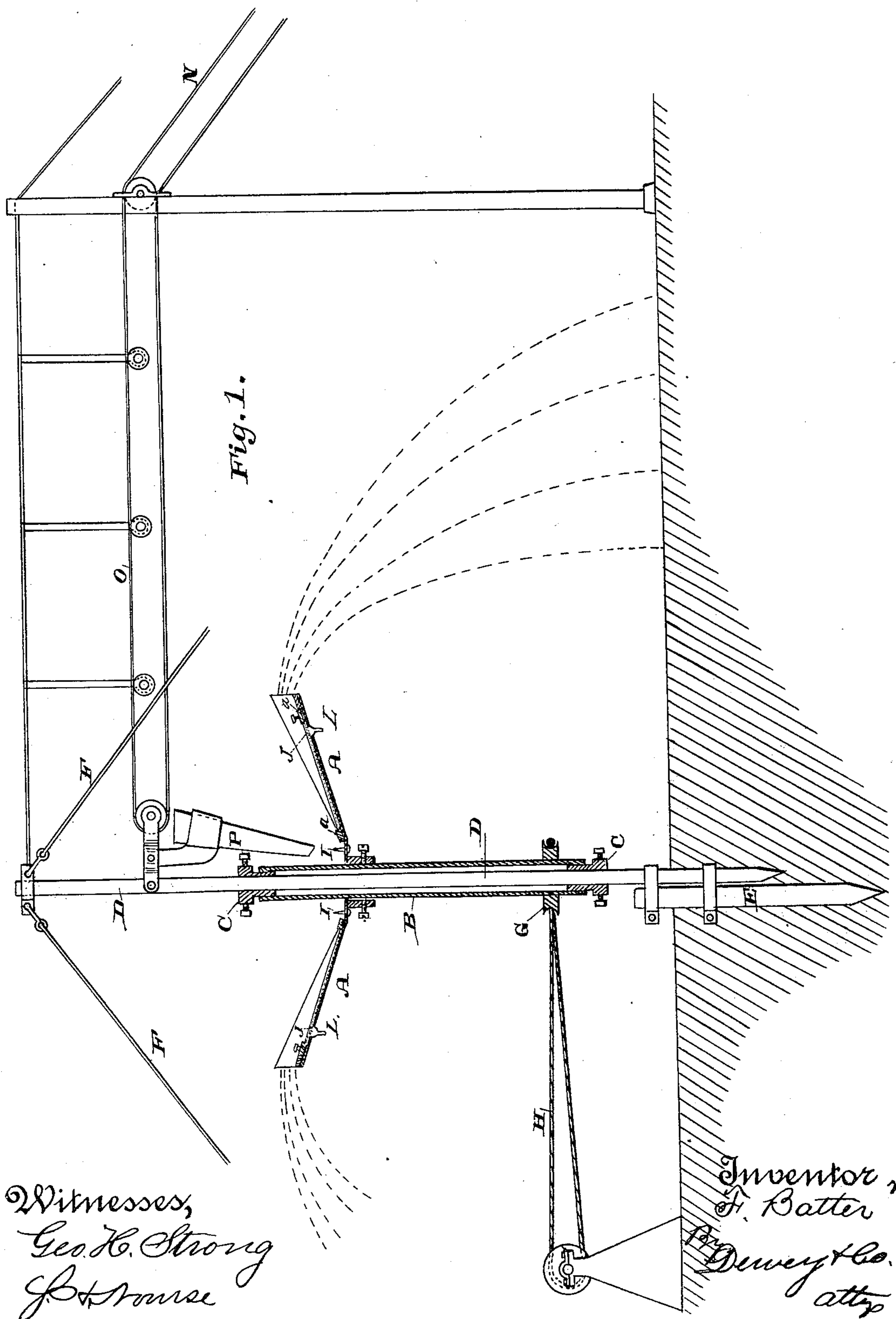


2 Sheets—Sheet 1.

No. 368,316.

Patented Aug. 16, 1887.



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(No Model.)

2 Sheets—Sheet 2.

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CONCENTRATOR.

No. 368,316.

Patented Aug. 16, 1887.

Fig. 3.

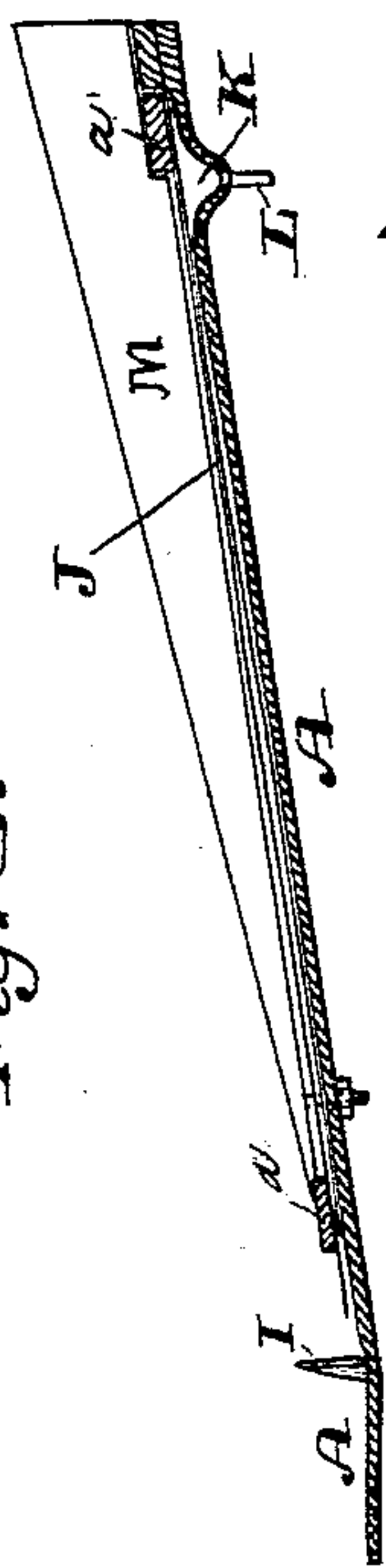


Fig. 4.

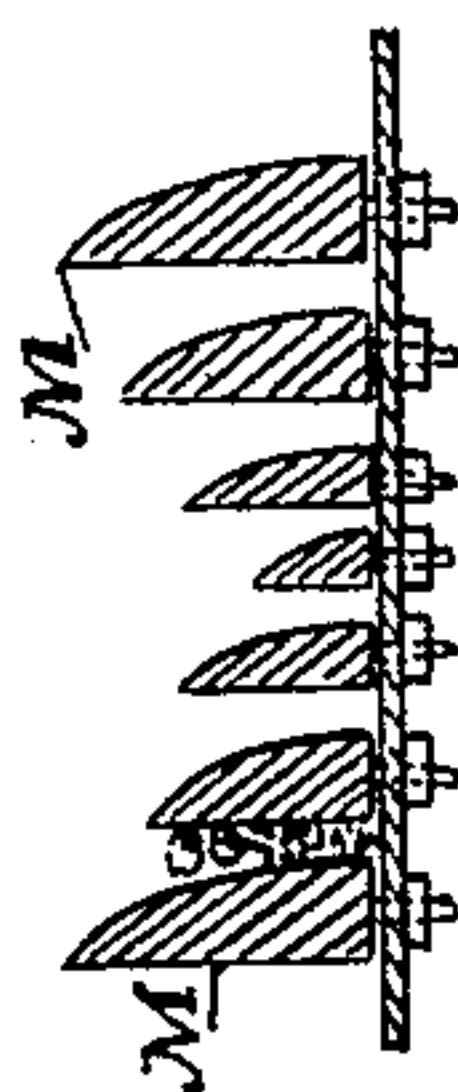


Fig. 5.

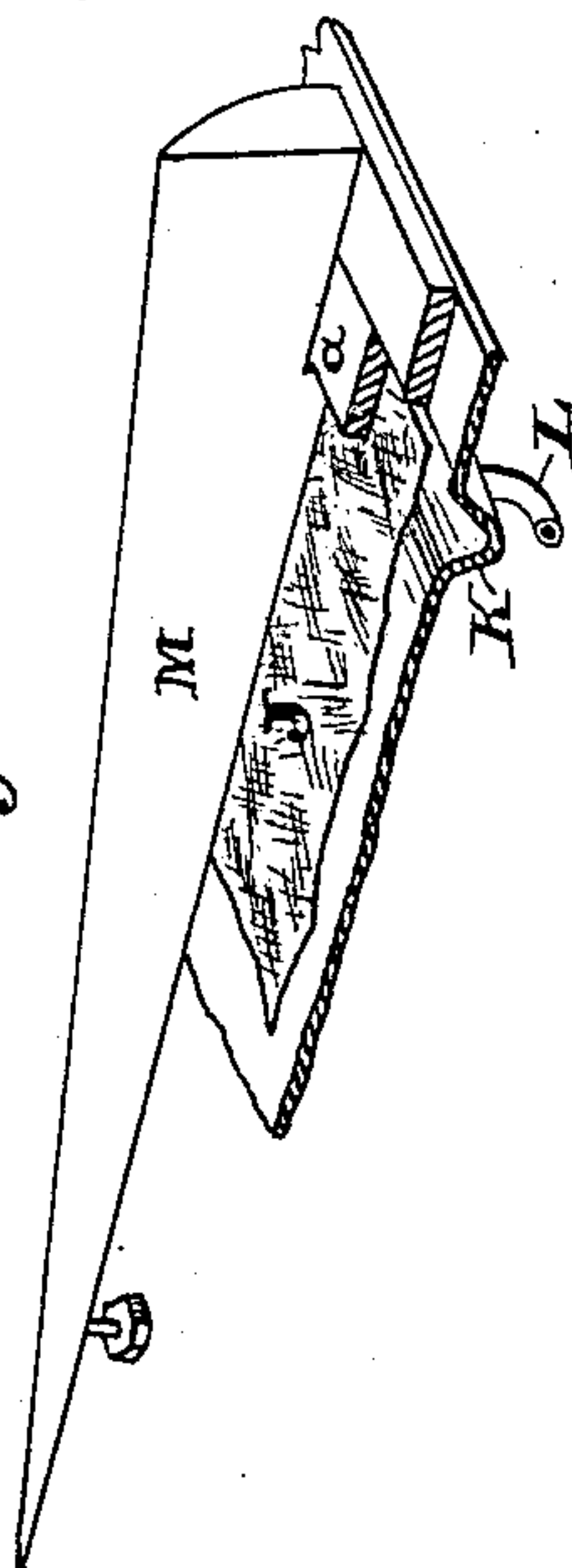
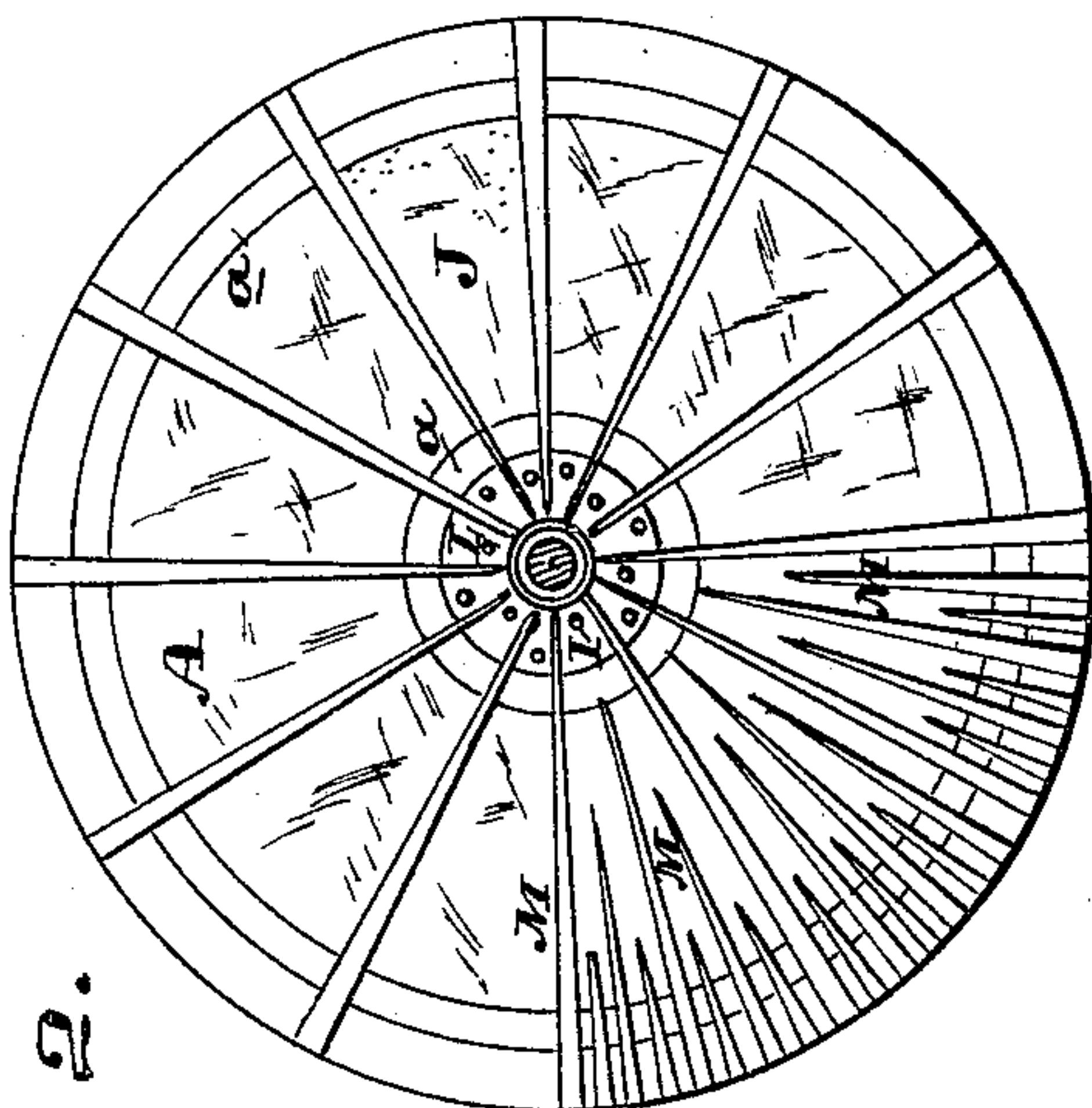


Fig. 2.



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UNITED STATES PATENT OFFICE.

FRANK BATTER, OF SLIDE, CALIFORNIA.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 368,316, dated August 16, 1887.

Application filed January 22, 1887. Serial No. 225,192. (No model.)

To all whom it may concern:

Be it known that I, FRANK BATTER, of Slide, Humboldt county, State of California, have invented an Improvement in Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for separating and concentrating the gold from gray sand, black sand, gravel, or rocks, which are found combined in large quantities; and it consists in the construction and combination of parts hereinafter described and claimed.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical section of my apparatus. Fig. 2 is a plan view of the pan. Fig. 3 is an enlarged view of one rib of the pan. Fig. 4 is an end view of the dividing-ribs, which extend radially from the circumference toward the center of the disk. Fig. 5 is an enlarged perspective view showing one of the radial dividing-ribs, the floor of the pan with the porous blanket upon its surface, and the water groove or channel and discharge-pipe.

Beach and other sands are often found with considerable quantities of gold and mixed with such large quantities of common gray sand, black sand, and gravel that it is impossible to profitably separate them by any apparatus which requires considerable handling of the material, and as the proportion of gold is usually quite small large quantities of the material must be operated on in order to produce any profit.

My apparatus consists of a pan, A, of considerable diameter, having the bottom inclined upward from the center toward the circumference, as shown. The central portion has a hub or other means for securing it to a vertical tubular shaft, B, which is fitted to revolve loosely between the collars C C. These collars are fixed to a vertical standard, D, which may either be set directly into the ground or may be clamped or otherwise secured to a post or pile, E, which has first been driven into the ground. Guy-ropes or braces F serve to support and steady the standard D.

Upon the lower end of the tube or sleeve B is fixed a pulley, G, to which power is applied in any suitable manner through a belt, H, so that the sleeve and the pan A may be rapidly rotated.

A portion of the bottom of the pan nearest the center is made nearly or quite horizontal, and from this point the bottom slopes upward at a small angle, which may be determined by the work to be done. Around the horizontal portion of the bottom are pins or projections I, which serve to divide the material delivered at this point and break up any friable lumps which may be among it.

Upon the outer and inclined portion of the pan A is fixed a blanket or porous substance, J. The inner and outer edges of the blanket-sections are held down in place by means of flat rings a, as shown in Figs. 2 and 5, and the bottom of the pan is channeled or grooved, as shown at K, so as to form a passage, into which the water which may be contained in the sand or material to be separated will be carried, being first forced through the porous or textile fabric J by the centrifugal action of the rotating inclined surface and the water then carried upward and outward until it reaches the channel K, when it will pass off through the passage, tube, or spout L.

From the periphery of the pan A dividing ribs or arms M extend toward the center, these ribs being of varying lengths, as shown in Fig. 2, and as the apparatus is rapidly rotated the sand passes outwardly between these ribs, being separated into smaller divisions as it reaches each set of ribs, and being also caused to move radially toward the periphery of the disk. These ribs are made, as shown in Fig. 4, vertical upon one side and inclined or curved upon the other, so that as the material enters the space between the ends of the ribs nearest the center the finest particles will lie upon the bottom, while the coarser, which cannot pass between them, will dispose themselves upon the tops of the ribs, or in the order of their size between the tops and the bottoms. The ribs commence at their inner ends at or near the head of the bottom A, and become gradually deeper toward the periphery, as shown in Figs. 3 and 5. This partial separation of sizes is also of assistance when the material reaches the periphery, as it causes the larger and heavier portions to be thrown the farther. The friction of those particles which lie lowest between the ribs also retards their movement and allows the larger ones to move more rapidly.

The sand may be elevated to a sufficient height to be discharged into the pan by means of a belt or elevator, N, and it may be carried any distance desired horizontally by means of another belt, O, upon which the first one discharges; or the belt O may be continuous with the belt N, if desired. At the inner end of the belt O the sand is discharged into a chute, P, supported from the standard or base D, and through this chute it is carried into the central portion of the pan A, as before described.

The operation will then be as follows: Being rapidly rotated, the sand, with any water which may be contained in it, will move outwardly and upwardly in radial lines over the surface or inclined bottom of the pan A, and the water passing through the fibrous or porous material upon the bottom will be received in the depression K and discharged through the pipe L, as before described. The sand will then be in an approximately dry condition and will be discharged over the edge of the periphery of the disk by centrifugal action, falling at different distances and being deposited in circles around the central shaft, as shown in the dotted lines in Fig. 1. The inner circle will contain the lightest material, which will be thrown the least distance, and the second circle will contain that which is slightly heavier, and so on to the outside. The gold, being exceedingly fine and light, will usually be found within the first circle, while the second will contain the ordinary gray sand, the third the heavy black or magnetic iron sand, and the fourth will contain the coarser gravel, the rocks of larger size, if any, falling still farther out. This so separates and concentrates the more valuable portions that it is very easy to work them by other processes after they have been separated by this apparatus.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The horizontal pan secured to a central axis to which a rotary motion is imparted, said pan having the dividing radial ribs of different lengths upon its upper surface and a chute or source of supply discharging into its central portion, substantially as herein described.

2. A vertical post having the rotary sleeve or tube surrounding it, in combination with a pan fixed to said sleeve, a chute discharging into the central portion of said pan, and radial dividing-ribs of different lengths upon its upper surface, substantially as herein described.

3. A horizontally-rotating dish-shaped pan having the radially-arranged ribs of different lengths upon its upper surface, and the vertical pins I, whereby the material is subdivided as it moves outwardly, substantially as herein described.

4. The horizontally-rotating dish-shaped pan with its radial ribs, dividing-pins, a channel or depression around its outer portion, and a discharge pipe or pipes leading downward from said channel, in combination with a fibrous or porous substance spread over the bottom of said pan, substantially as described.

5. The circular rotary pan, in combination with the radially-disposed ribs of different lengths, made shallow at their inner ends and increasing in depth toward the periphery, said ribs also decreasing in thickness from the bottom to the top, substantially as herein described.

In witness whereof I have hereunto set my hand.

FRANK BATTER.

Witnesses:

S. H. NOURSE,
H. C. LEE.