No. 681,561. Patented Aug. 27, 1901.

J. H. MICHELSEN & M. LA-M. BORGLUM.

FEED BOX FOR ORE CONCENTRATORS.

(Application filed Apr. 25, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

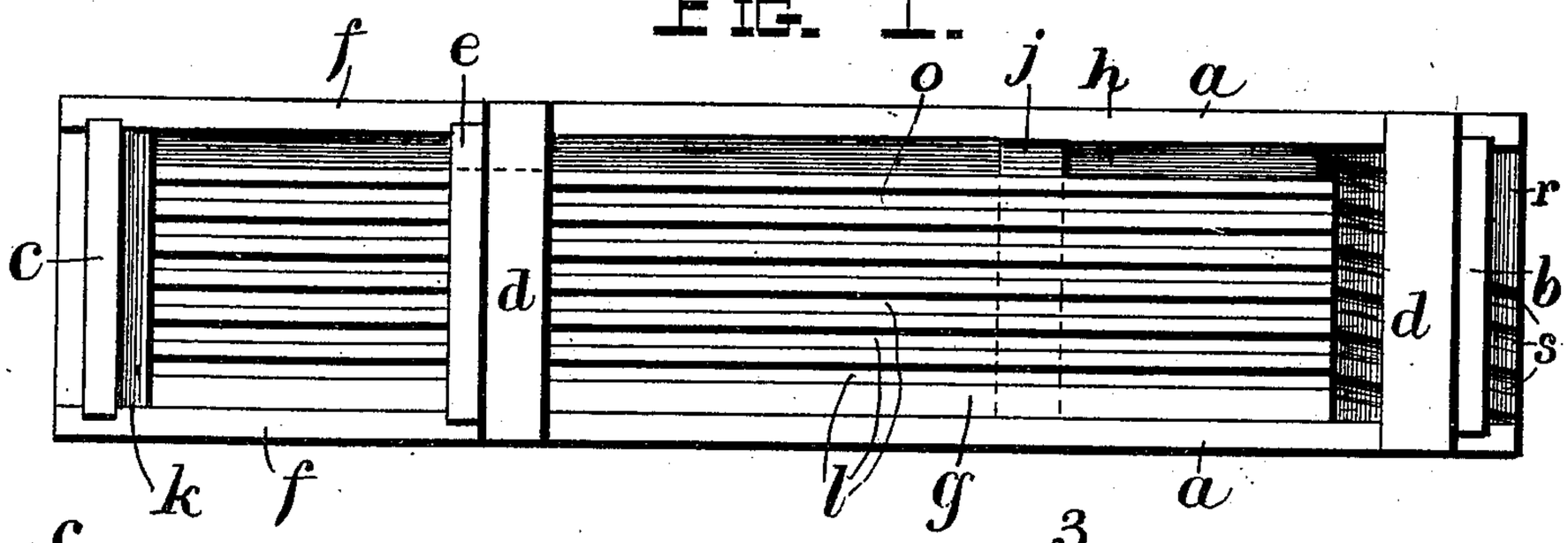

FIG. 2.

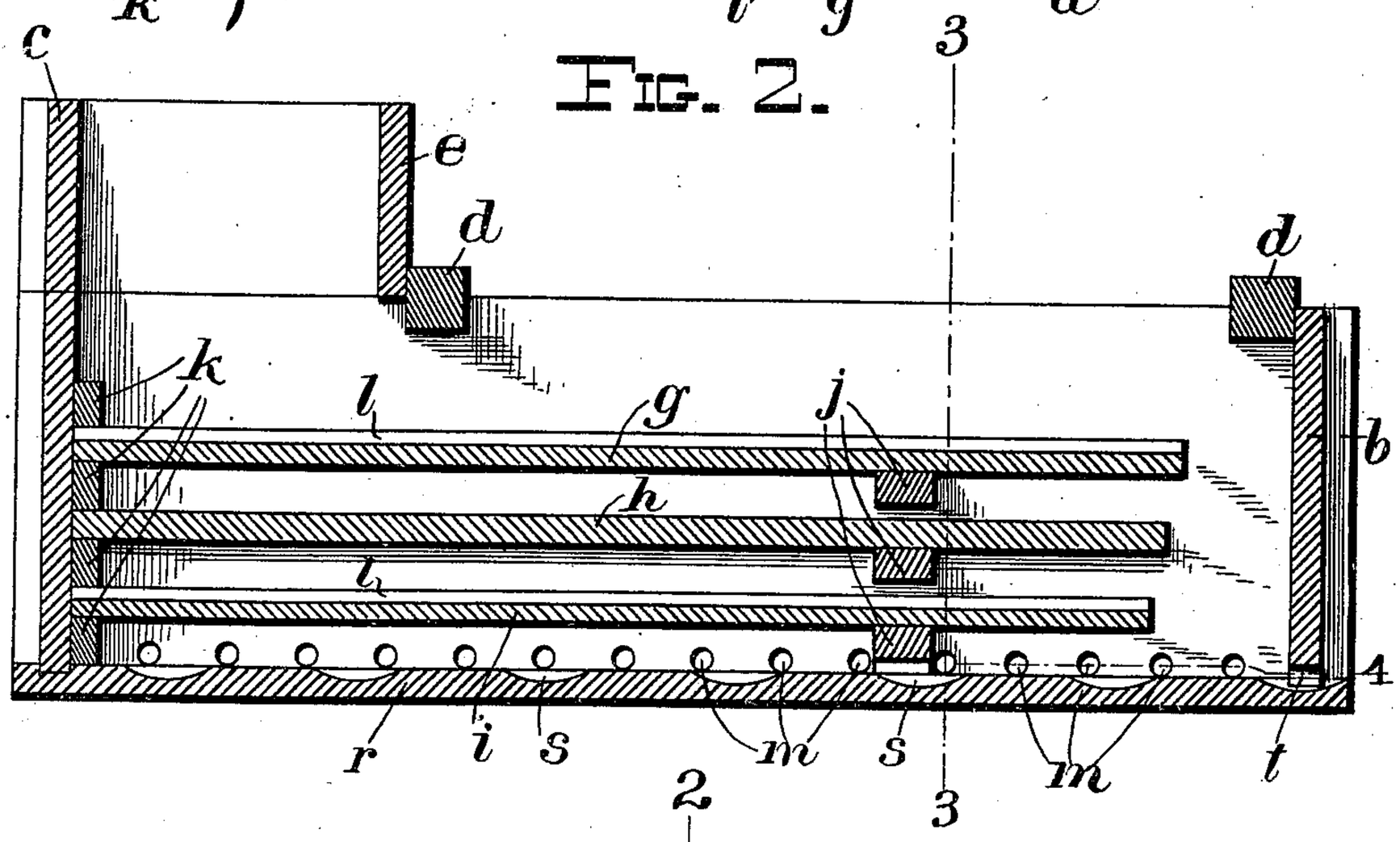

FIG. 3.

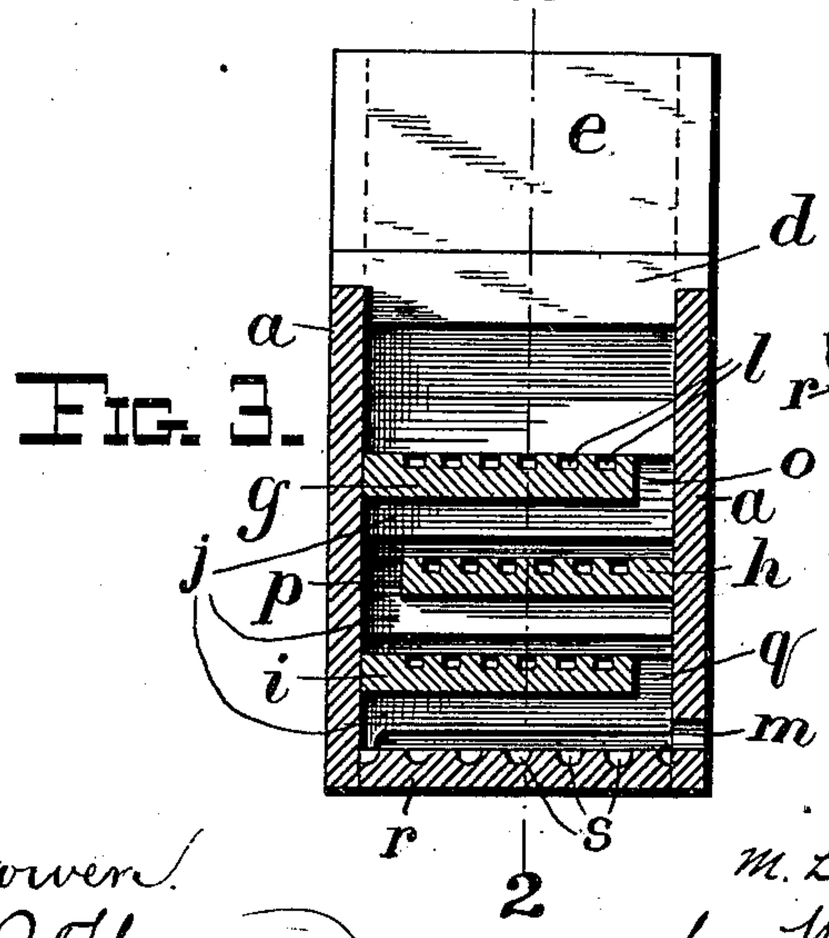

FIG. 4.

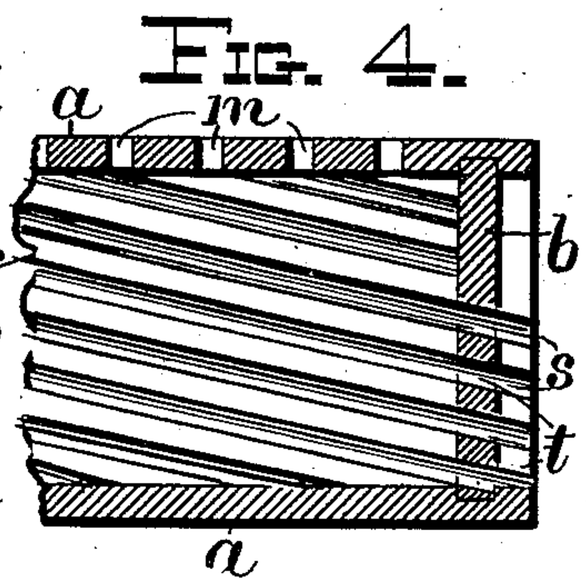

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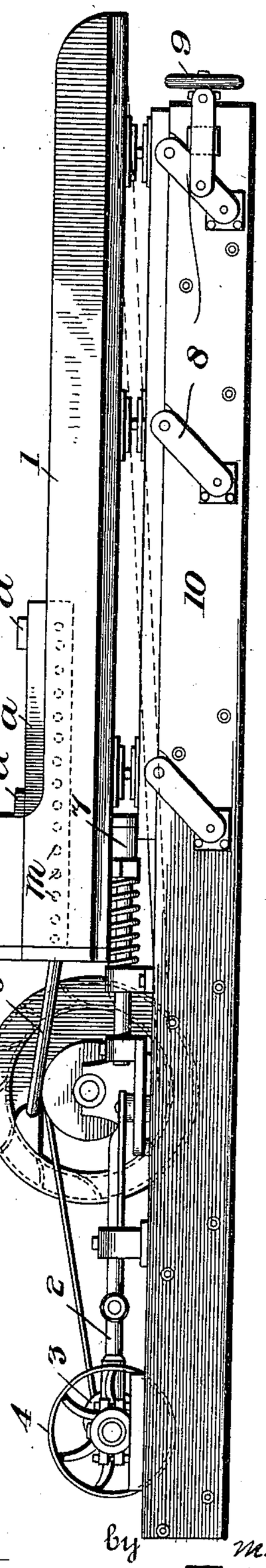
Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN H. MICHELSEN AND MILLER LA-MOTHE BORGLUM, OF BUTTE, MONTANA.

FEED-BOX FOR ORE-CONCENTRATORS.

SPECIFICATION forming part of Letters Patent No. 681,561, dated August 27, 1901.

Application filed April 25, 1901. Serial No. 57,458. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. MICHELSEN and MILLER LA-MOTHE BORGLUM, citizens of the United States, residing at Butte, in the county of Silverbow and State of Montana, have invented certain new and useful Improvements in Feed-Boxes for Ore-Concentrators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in feed-boxes for ore-concentrators, and is designed especially for use in connection with a concentrator of the type shown in the patent to J. H. Michelsen, No. 671,348, dated April 2, 1901.

In feed-boxes such as have been hitherto used the mineral to be concentrated runs directly into the box, through the box, and out through holes upon the concentrating-table, allowing much of the valuable light material to escape, the light or float passing directly through the box with the water and is carried off in the overflow. Our invention remedies these defects, and instead of allowing the float or lighter minerals to separate from the heavier the two are kept together and are not carried away by the water.

With these objects in view our invention consists of the constructions and combinations of parts as are hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of our improved feed-box. Fig. 2 is a central longitudinal section taken on the line 2 2 of Fig. 3. Fig. 3 is a cross-section taken on the line 3 3 of Fig. 2. Fig. 4 is a section on the line 4, Fig. 2, looking down; and Fig. 5 is a side elevation of a concentrating-table, showing our invention applied thereto.

As shown in the drawings, the device consists of a long rectangular box, having the sides *a a* and the ends *b c* mortised therein.

d d are cross-beams, and *e* is a partition rising from one of said beams and forming, with the upwardly-extending end *c* and the sides *f f*, a sort of hopper.

Running lengthwise of the box are three shelves *g*, *h*, and *i*, each provided with longitudinally-extending grooves *l*, in which the minerals lodge. These shelves on one side and on one end fit closely against the side of the box; but they are separated from the other side by the openings *o*, *p*, and *q*, forming a staggered arrangement, since the opening *p* is on the opposite side of the box from the openings *o* and *q*. As shown in Fig. 2, the upper shelf *g* is the longest, and the middle shelf is longer than the lower shelf *i*. Cross-beams *j k* serve to support these shelves, space being left between the lower side of each of the beams *j* and the upper surface of the next adjacent shelf.

Running diagonally across the bottom *r* of this box are a plurality of channels or grooves *s*, the bottoms of these grooves being rounded, as shown. At one end *b* of the box openings *t* are provided, through which the heavy material from the grooves *s* passes. At regular intervals along one side *a* of the box are provided a plurality of holes *m*, located at about on a level with the surface of the bottom of the box.

In Fig. 5, 1 represents a table such as described in the Michelsen patent, hereinbefore mentioned. 2 represents a pitman, connected to the table at 7 and is adapted to be given a reciprocating motion by the eccentric 3, mounted upon the shaft with the belt-wheel 4. 5 is an elevating-wheel for supplying water to the concentrating-table by the pipe 6. 8 represents the elevating or tilting mechanism, operated by the hand-wheel 9, mounted in the base 10, whereby the table is given an incline from the feed-box toward the opposite side of the table.

The action of the material in passing through the device is as follows: The material including the light or float and the heavier material mixed with the dirt, &c., are fed in a homogeneous mass into the box through the hopper end thereof, together with the water or washing medium. This material is washed over the shelf *g*, particles of the light and heavy material settling into the grooves thereon. The dirt and water and some particles of the mineral will wash over

the side of the shelf *g* to the shelf *h*, leaving some of the mineral in the grooves upon this shelf and repeating the action upon the lower shelf *i*, in each case the light or float being prevented from overflowing the edges of the shelves to a large extent by the grooves *l*. Reaching the bottom *r* of the box the lighter material and float are both caught by the rounded grooves *s*. From these grooves the materials pass out upon the concentrating-table, the heavier material passing through the end holes *t* and the greater portion of the float or lighter material passing through the side holes *m*.

This feed-box is secured to the concentrating-table in any suitable manner, such as by brackets or angle-irons, and the vibratory motion of the table is imparted to it, the straight grooves on the shelves being in line with the movement of the table. It will be found that a larger portion of the heavier mineral will find its way to the projecting ends of the shelves and will be precipitated to the bottom of the box and will find its way either through the end holes *t* or side holes *m*, the float or lighter mineral taking its sinuous course over the shelves and finally out through the side holes *m*.

It is obvious that many changes in the proportions and details may be made without departing from the spirit of our invention, and we do not confine ourselves to the precise form shown.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. A feed-box rectangular in outline provided with a feed-hopper at one end, a row of discharge-holes near its bottom, a series of grooved shelves of different lengths arranged one above the other, each of said shelves being separated from one of the sides of the box by a space, said spaces being arranged alternately on different sides of the box.

2. A feed-box rectangular in outline provided with a feed-hopper at one end, a row of discharge-holes on one side near the bottom, a series of holes in one end of said box, a plurality of grooved shelves of different lengths arranged one above the other within said box, each of said shelves being spaced from the side of the box at opposite sides to the next adjacent shelf, and a diagonally-grooved bottom for said box, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN H. MICHELSEN.
MILLER LA-MOTHE BORGLUM.

Witnesses:
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G. E. DE SNELL.