

J. J. WILLIS.

Separating Ores and other Materials.

No. 152,715.

Patented June 30, 1874.

FIG. I.

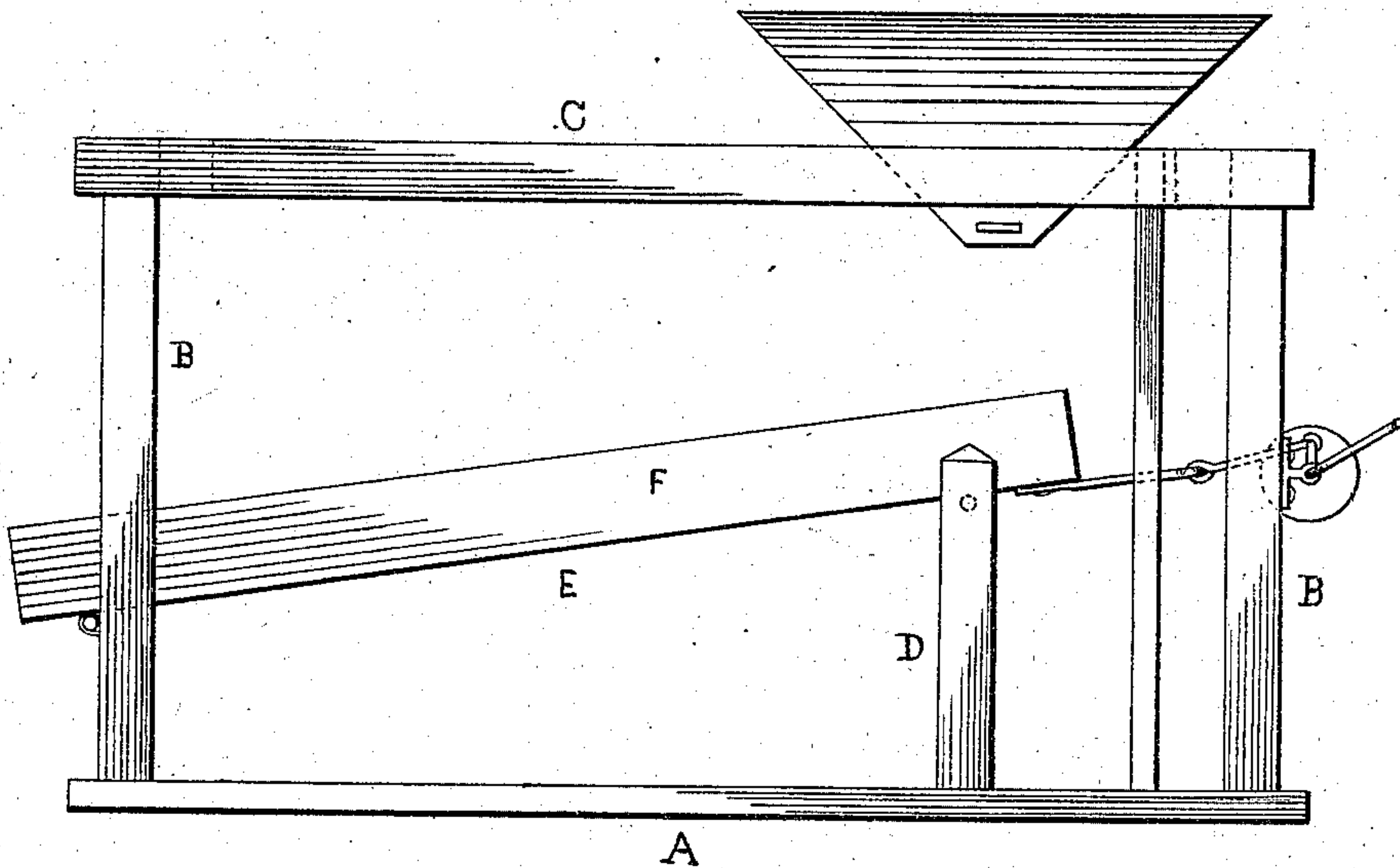
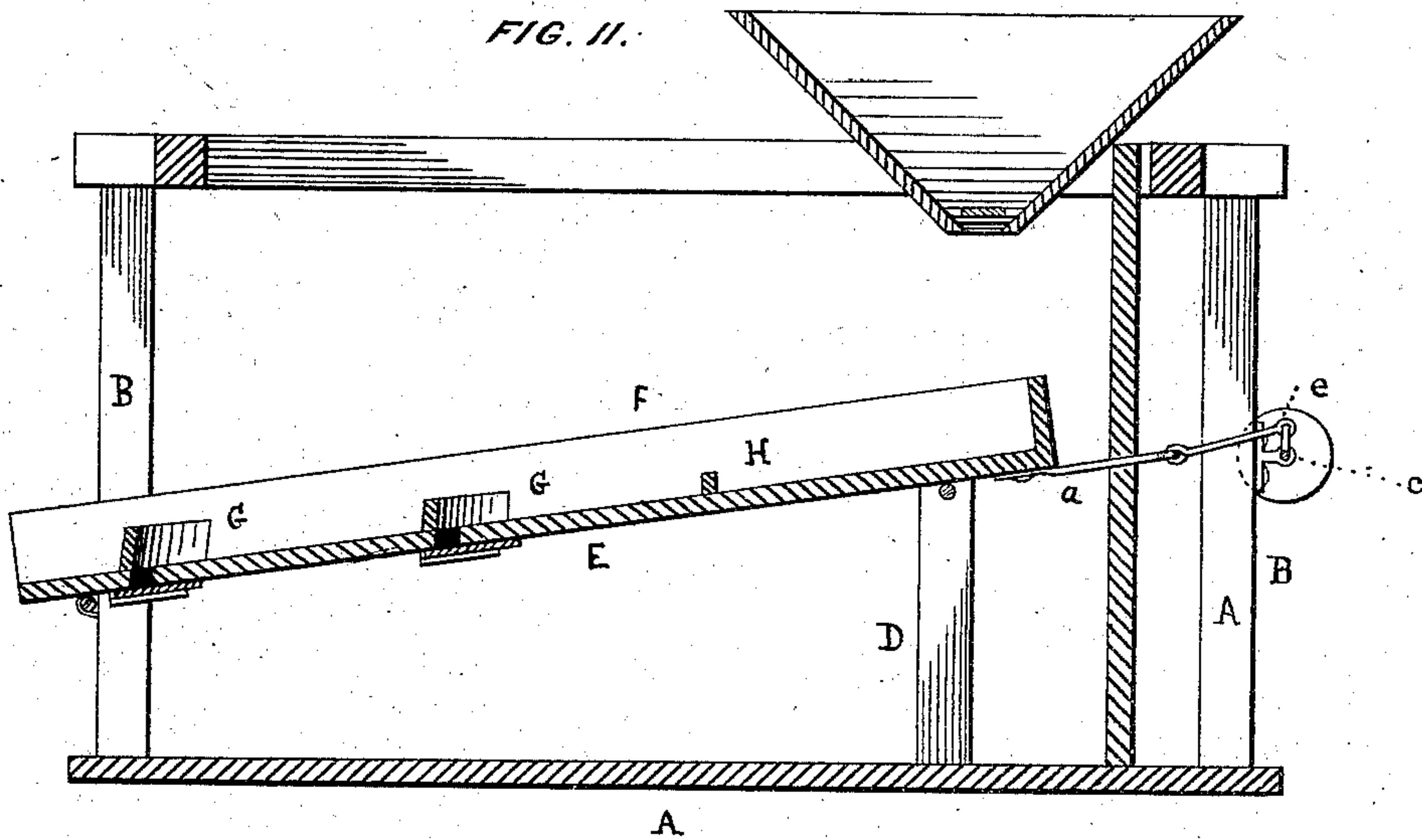


FIG. II.



WITNESSES:

A. H. Norris,  
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INVENTOR.

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# UNITED STATES PATENT OFFICE.

JOHN J. WILLIS, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEPARATING ORES AND OTHER MATERIALS.

Specification forming part of Letters Patent No. **152,715**, dated June 30, 1874; application filed June 10, 1874.

*To all whom it may concern:*

Be it known that I, JOHN J. WILLIS, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in a Process and Apparatus for Separating Ores, Dry Chemicals, Coffee, &c., of which the following is a specification:

My invention has for its object to construct a machine or apparatus by the use of which all stone, gravel, dirt, and other foreign matter can be readily removed from the mass desired to be cleaned, such as, for instance, dry chemicals, coffee, and other substances. My invention consists in constructing such machine or apparatus with a trough, upon the interior of which is arranged one or more arresting partitions or pockets, in such a manner that the bodies possessing the greatest gravity in their descent through such trough will be retained by the arresting partitions or pockets, while the lighter particles will pass over the partitions on their way, and out of the mouth of the trough into bags, or into a proper duct leading to bins or other storage apartment, a reciprocating or a lateral shaking motion, either or both combined, being imparted to the trough, so that the mass contained therein will be subjected to a constant agitating or sifting action, the mechanism for imparting such motion being of any of the well-known systems.

In the drawings, Figure 1 represents a vertical side elevation of my improved apparatus. Fig. 2 is a vertical central section, illustrating the passage of the chemicals, coffee, or other mass to be operated upon.

Referring to the drawings, the letter A designates the frame-work of the machine, which, in the present instance, consists of a base, A, four vertical posts, B, two horizontal beams, C, and two uprights, D D, for supporting the rear end of the trough, and all firmly braced. This construction is only illustrative. It will be varied, since, in some cases, the machine will be of a stationary character, while in others it will be portable. In the present instance the hopper is supported upon the horizontal beams or supports C, its exit being so arranged as to deposit the material to be separated or sifted into the agitating-trough, and

such exit will, of course, be controlled by a suitable valve or cut-off in any of the usual ways. The agitating-trough, which is the prime element of my invention, consists of a bottom, E, and sides F F, there being arranged within the same one or more partitions or pockets, G, in some instances straight, and in others oblique, as at H I J, and such partitions may be upon the top of the bottom boards, or depressed so as to be below it.

The object and effect of either arrangement are about the same, being to arrest the descent of the material to be sifted on its way from the hopper or chute, the partitions causing the heavier particles to descend, while those possessing a lighter gravity will ascend or pass over the partitions or pockets, the rapidity with which they pass or traverse the trough being governed by the shaking motion imparted to the trough.

I prefer that the first partition H should be of a height less than either of the remaining ones, as it is desirable to have such perform the office of a distributor as soon as the material enters the trough from the hopper or chute. Each of the arresting partitions or pockets will be supplied with a discharge opening, valve, or trap, so as to empty the sediment, stone, gravel, and other foreign matter collected from the mass during the separation process. A reciprocating or a lateral sifting or shaking action will be imparted to the trough, either by hand, steam, or water motive power—in the present instance by means of a connecting-rod, *a*, attached by a joint, *e*, with a rock-shaft, *c*, journaled upon the posts or frame-work supporting the apparatus.

I prefer that the partitions should be angularly arranged within the trough, since, by such construction, all the heavier and foreign matter present in the material to be sifted will be concentrated at such angular portion of the partition, so that the same can be easily discharged through a single opening in the bottom of the trough—a result that could not be practically secured if the partitions to form the pockets were straight, as the openings would have to be enlarged, and extend parallel with the partition-boards.

The object of using several arresting partitions or pockets is to secure a perfect separa-



tion of gravel, dirt, and other foreign matter from the material, so that should any of the foreign material escape from the first or second series of pockets, it will be collected and retained by the last one, which should be deeper or of more volume than either of the others.

My invention, I anticipate, will be especially useful in cases where large quantities of grain, coffee, or other material become mixed, as often occurs at fires, and when cargoes become broken and mixed in transit. It is also peculiarly adapted for the separation of stones and dirt from coffee—that coming from San Domingo never being free therefrom.

The bottom of the trough will, in some instances, be provided with a perforated bottom, or supplied with a wire netting, constructed of a suitable foraminous material, so as to separate the smaller or broken grains, and by such all dirt or smaller stone will be conducted through the bottom of the trough, leaving the larger stones or foreign material collected and retained in the pockets.

I claim as my invention—

1. The within-described process of freeing dry chemicals, coffee, and other such products of the foreign matter connected or mingled therewith, the same consisting in causing the material to pass through a trough containing one or more arresting pockets or partitions of unequal height, said trough having imparted to it a sifting or shaking motion between guide-columns, substantially as described.

2. Partitions arranged within a movable trough for forming pockets, an opening being formed in front of the pockets for the discharge of the heavier material, as set forth, for collecting and arresting the heavier material in its passage through such trough, the lighter material passing over such pockets.

In testimony that I claim the foregoing I have hereunto set my hand.

JOHN J. WILLIS.

Witnesses:

JAMES L. NORRIS,  
ALBERT H. NORRIS.