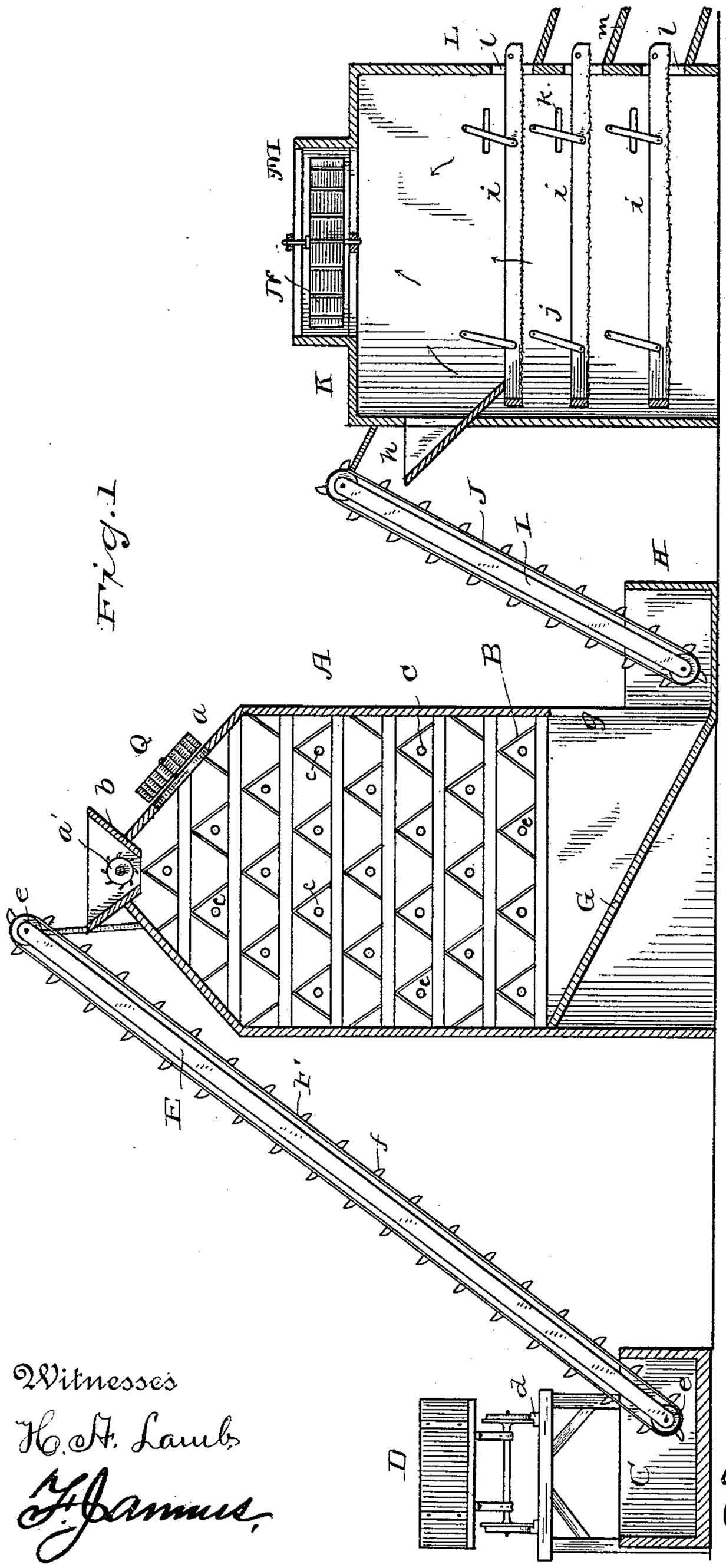
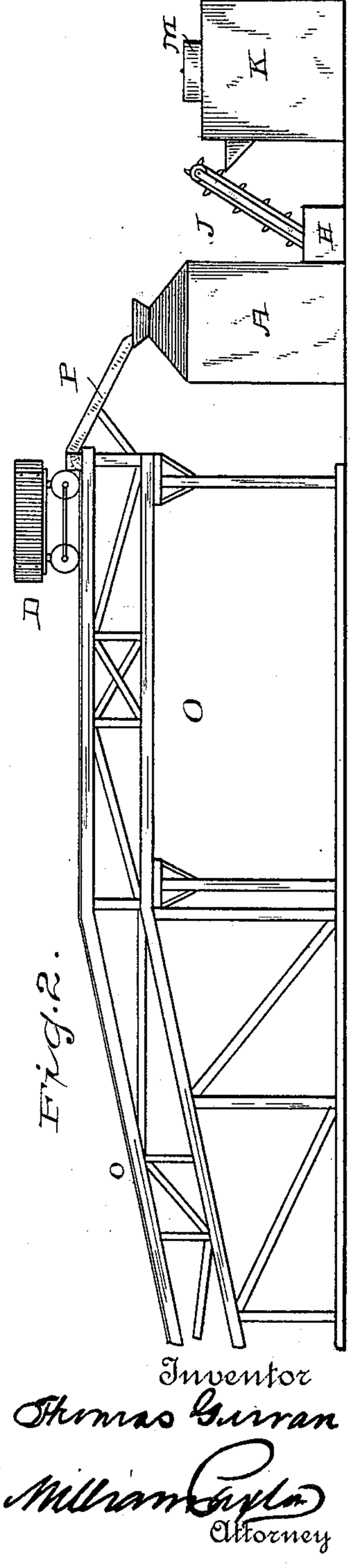
(No Model.)

T. GIRVAN.

APPARATUS FOR CLEANING AND ASSORTING SAND.

No. 405,732. Patented June 25, 1889.





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THOMAS GIRVAN, OF NEW YORK, N. Y.

APPARATUS FOR CLEANING AND ASSORTING SAND.

SPECIFICATION forming part of Letters Patent No. 405,732, dated June 25, 1889.

Application filed February 9, 1888. Serial No. 263,531. (No model.)

To all whom it may concern:

Be it known that I, THOMAS GIRVAN, of the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Cleaning and Assorting Sand, of which the following is a specification.

My invention has reference to apparatus for cleaning and assorting sand for the purpose of bringing the same to the best condition for actual use; and the said invention consists in the improvements, hereinafter described and explained, whereby the primary material—*i. e.*, sand, loam, and generally vegetable and other foreign matter—is first effectively heated and dried, so that all moisture is removed therefrom, and then independently subjected to a screening operation, wherein the agitation of the screens enables the loam and other foreign matter to be withdrawn through the agency of an exhaust-fan, while the resultant sand passes through the screens to be graded and assorted.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical sectional elevation of the improved apparatus for cleaning and assorting sand, and Fig. 2 is an elevation representing a modified form of elevator for delivering the primary material to the receiving end of the drier.

In Fig. 1, A designates a drier consisting of a vertical closed chamber contracted at its top *a*, at which point a receiving-hopper *b* is located, and having a feeding device *a'*. Interiorly the chamber is provided with a series of transverse horizontal shelves B, which are triangular in cross-section and arranged to alternate with the shelves in the tiers above and below. A steam-pipe *c* passes through each shelf and serves to heat the same, so that its faces will radiate heat. A hopper C is located at one side of the drier and receives the material in its primary condition from the cars D, moving upon the track *d*, adjacent to said hopper C, or by any other suitable transporting medium. An inclined elevator-frame E is provided at its ends with rollers *e*, around which passes an endless carrier-belt F, provided with buckets *f*. The lower extremity of this endless carrier extends into the hopper C, while its upper end is immediately over the receiving-hopper *b* of the drier. The bottom G of the drier is inclined downward toward a discharge-opening *g*, formed in the lower portion of the drier and communicating with a receptacle H, located at one side of the drier. An inclined elevator-frame I is provided with endless carrier J, similar to the one previously described, and the lower extremity of said carrier J extends into the receptacle H, while the upper end extends over a hopper *h*, located in the side of a screening apparatus K. This latter apparatus consists of a closed chamber, in which are located a series of superimposed horizontal screens *i*, of different mesh, and each pivotally suspended within the chamber by means of links *j*. A horizontal slot *k* is formed in the side of the chamber adjacent to one of the links of each screen, so as to enable the said link to be connected to suitable devices for horizontally vibrating the screen within the chamber. The side L of the chamber is provided with a series of transverse openings *l*, through each of which extends the open end of one of the screens *i*, to deliver its tailing to a discharge *n*. The top of the screening-chamber is provided with a circular opening N, in which is placed an exhaust-fan M, driven in any suitable manner.

In operation the primary material in a moist condition is transported to and deposited in the receptacle C, from which it is taken by the first endless carrier and delivered to the receiving-hopper of the drier, so that it can be thoroughly heated by the shelves to cause the moisture to be completely driven therefrom. The exhaust-fan Q removes the moisture from the inclosed chamber as rapidly as it is evolved from the material. The said primary material in a thoroughly-dried condition passes to the receptacle H, from which it is quickly and continuously removed by the endless carrier J and delivered to the hopper *h*, through which it passes to the screens. The agitation of the screens throws the loam and other foreign matter to a position to be freely acted upon by the exhaust action of the fan M, and causes the said loam and other foreign matter to be broken up, so that it is completely lifted from the sand and discharged to the atmosphere. The feature of first heating and drying the primary material and then quickly and independently agitating the sand by means of screens to assort it

and reduce the loam, &c., to enable its ready separation, is the most important advance in the art of treating sand, for unless the primary material is thoroughly dry when it enters the screening-chamber the loam, &c., would be in a more or less heavy and compacted condition, preventing the free action of the screens to grade the sand and resisting the action of the fan N to elevate and remove the loam, &c. If it were attempted to drive off the moisture coincident with the screening operation, the vapor above the material would saturate the loam, &c., as it began to ascend and cause it to become heavy and drop back upon the screen. Hence it is that sand treated by my improved apparatus is in a much better condition as regards grade and purity than any previous article of which I have been advised. Another benefit incident to my improvement consists in the fact that the loam and foreign matter cannot clog the meshes of the screens or interfere with the separating and assorting operation generally.

I claim—

In an apparatus for cleaning and assorting sand, the combination, with the heating-drier comprising an inclosing-case and a fan for withdrawing the moisture, of the separator comprising a distinct inclosing-case, agitated screen or screens, and a fan for withdrawing the dust, &c., from the sand as it traverses the screens, substantially as set forth.

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