

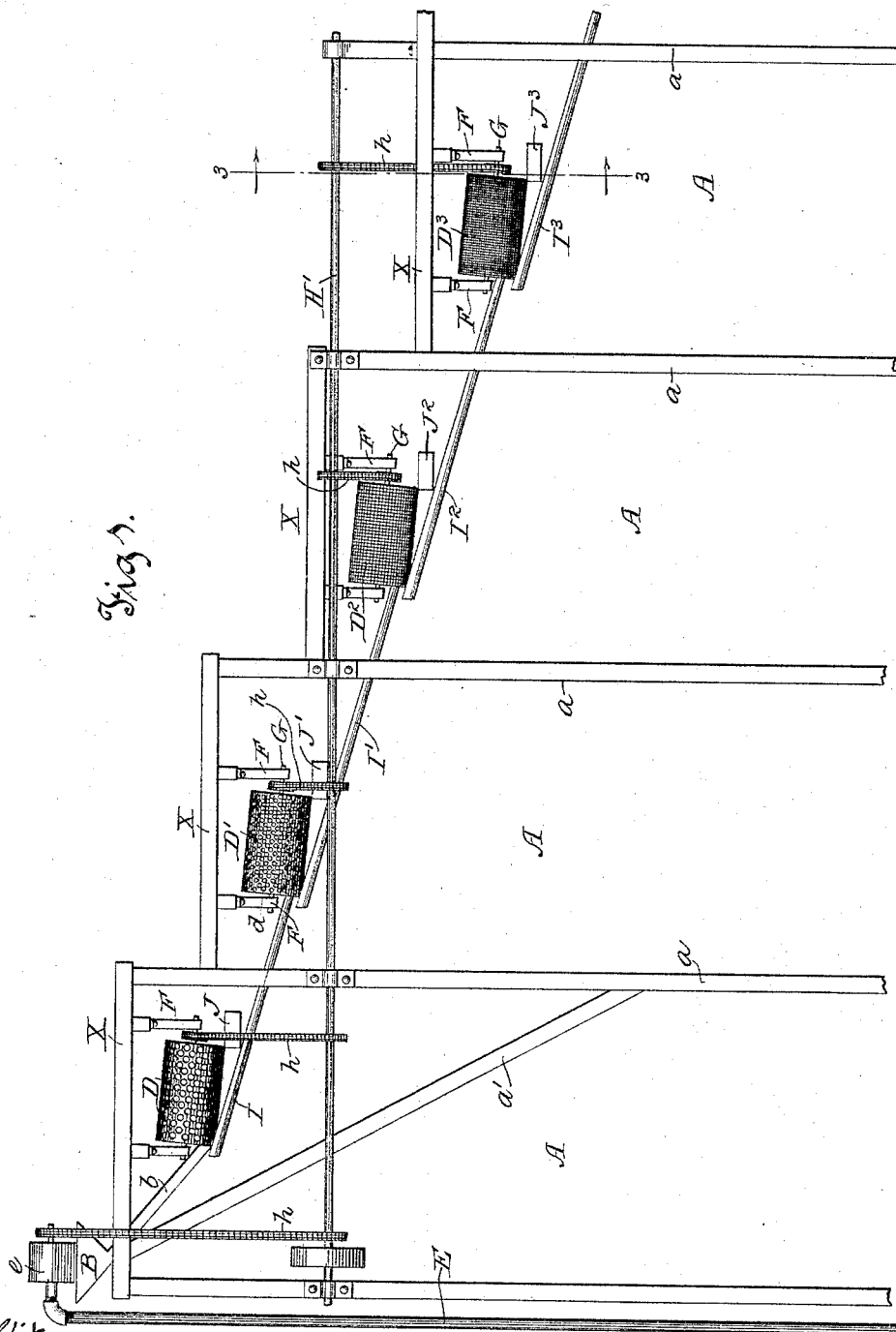
(No Model.)

2 Sheets—Sheet 1.

E. G. & E. D. HAMMOND.
WASHING AND SIZING MACHINE.

No. 489,738.

Patented Jan. 10, 1893.



Witnesses
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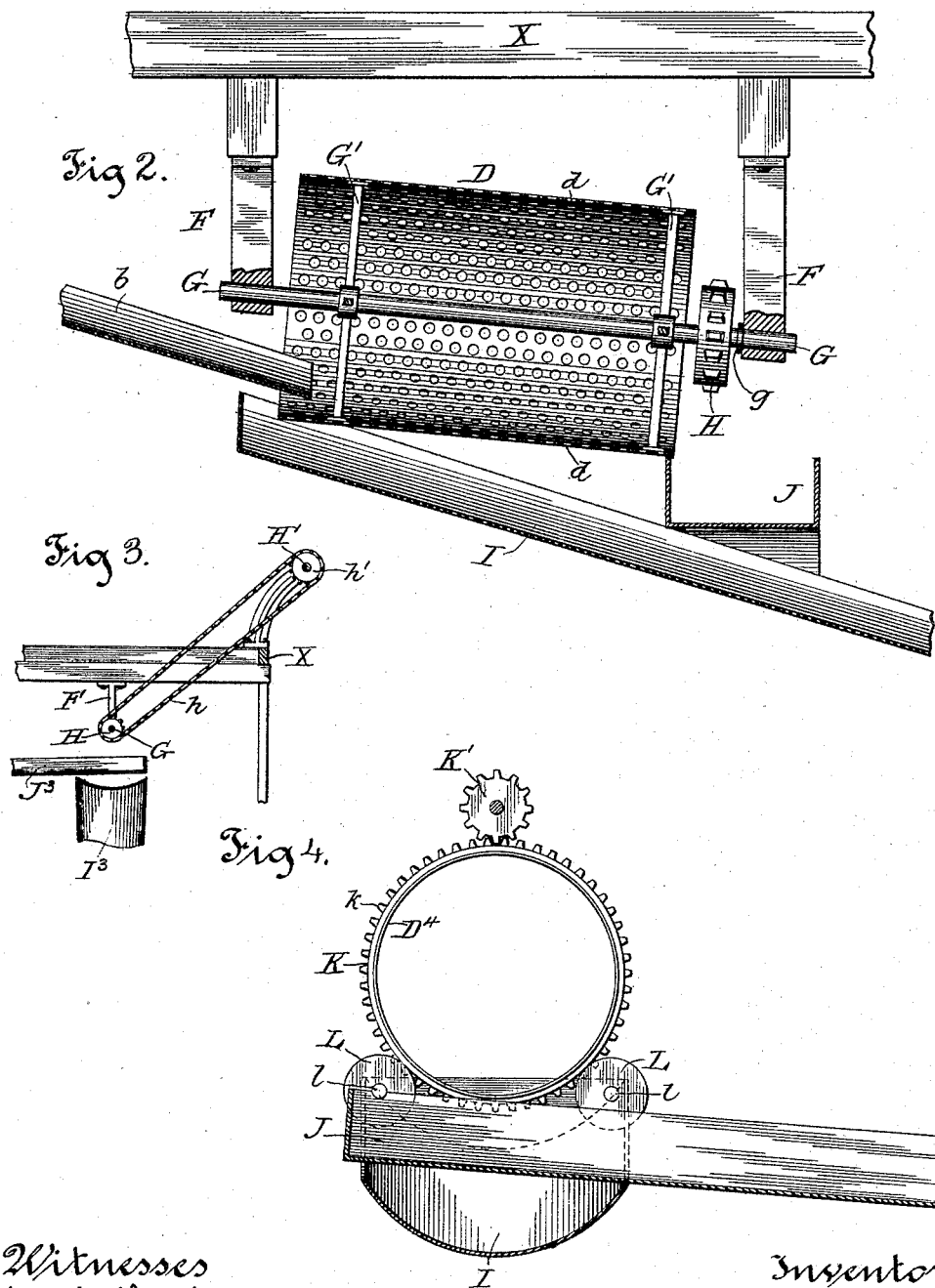
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UNITED STATES PATENT OFFICE.

EUGENE G. HAMMOND AND EDWARD D. HAMMOND, OF HANOVER, ILLINOIS.

WASHING AND SIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 489,738, dated January 10, 1893.

Application filed March 28, 1892. Serial No. 426,835. (No model.)

To all whom it may concern:

Be it known that we, EUGENE G. HAMMOND and EDWARD D. HAMMOND, residents of the town of Hanover, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Washing and Sizing Machines, of which the following, in connection with the drawings accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to understand and make the same.

The purpose of our invention is to obtain a device whereby sand, gravel, coal, and other like material can be elevated, water applied thereto, if desired, and the material with the water when applied, conveyed to a rotatable screen, and such material, and water, if water is used, be discharged from the screen and the material thereby sized and conveyed to a second screen, where the same operation is repeated until the material is separated into the several sizes desired, and where the water is used as suggested such material in addition to being sized is washed.

We have illustrated our invention by the drawings accompanying and forming a part hereof, in which:

Figure 1, is a side elevation of coal, gravel, or sand bins having a machine embodying our invention mounted thereon; Fig. 2, a vertical longitudinal section of one of the rotatable screens entering into the device with the several spouts in position therewith; showing a construction of the perforated cylinder; Fig. 3, an elevation on line 3—3 of Fig. 1, viewed in the direction indicated by the arrows; and Fig. 4, an end elevation of the end of a cylinder embodying certain additional inventions which may or may not, as desired, enter into the construction of the device, illustrated in Fig. 1, as embodying our invention.

The same letter of reference is used to indicate a given part where more than one view thereof is shown in the several figures of the drawings.

A, A, A, are the bins, *a, a, a*, being the up-rights thereof.

a', is a brace which may or may not be used in the construction of the bin, its use depending on the weight of the material contained in the hopper of our device in comparison with the stability of the bins.

B, is a hopper; and *b*, is a spout extending therefrom, to and delivering into the inside of the perforated cylinder D entering into and forming one of the elements in the construction embodying our invention.

D', D², D³, are perforated cylinders constructed and mounted in the same manner and for the same purposes as is the cylinder D, the only difference being in the size of the foraminations or perforations of the cylinder whereby the material passing from the cylinder through such perforations or foraminations is graded or sized.

E, is a water pipe; and *e*, is a pump by which water is raised in pipe E and delivered into the hopper B.

d, d, are the holes or perforations in the several cylinders D, D', D² and D³. Cylinder D as well as the several cylinders D', D², D³, respectively, are illustrated in Figs. 1 and 2 as mounted on the top timbers X of the bins in the hangers F, F, and rotating in such hangers on the shaft G, such shaft forming the axis of the cylinders respectively, and having thereon arms G' extending out to and supporting the foraminated cylinders.

g, is a collar on shaft G holding it in position, that is, receiving the downward thrust of the revolving cylinder and shaft.

H, is a sprocket wheel on shaft G; and *h*, is a sprocket chain extending from the sprocket wheel H to and over sprocket wheel *h'* on main driving shaft H'.

I, is a spout extending from under the cylinder D to and delivering its contents into the cylinder D'; and I', I², respectively, are like spouts underneath cylinders D', and D².

I³, is a spout underneath the cylinder D³.

The several spouts I, I', I², I³ receive therein the material passing from the several cylinders, located over them, through the perforations therein, and the material in such cylinders not passing through the perforations extends the length of the cylinder and passes out of the other end thereof into or on the spouts or hoods J, J', J², and J³, respectively.

Where, as in Fig. 1, this machine is placed over bins A, A, the spouts or hoods J, J', J², and J³, respectively, serve merely to protect the spouts I, I', I², I³, respectively, from receiving the contents of the cylinders delivered out of the ends thereof and may be a

mere hood, but where the material delivered from the end of the cylinders is to be conveyed any distance therefrom a spout is necessary.

5 As will be readily understood by inspection of Fig. 1, the manner of operation of this device is, the material and water is delivered from the hopper B through the spout *b* into the cylinder D, the finer material therein, cylinder D being continuously rotated, passes
10 through the perforations *d* together with the water, or nearly all of the water, and falls into the spout I, I, while the material not passing through the perforations *d* extends
15 through the cylinder D passing out of the lower end thereof on to the hood J from which it falls into the bin A underneath the cylinder D. The liquid and finer material passing into the spout I, as described, extends
20 along in said spout and is delivered into the cylinder D' where it is again sized, the smaller pieces thereof passing through the perforations *d* in the cylinder D' together with the liquid into the spout I' being delivered into
25 the next adjacent cylinder in the same manner, while the particles or pieces of the material not passing through the perforations *d* in cylinder D' extend through the cylinder and out of the end thereof in the same
30 manner as last described, in regard to the cylinder D, and on to the spout or hood J', falling into the bin A thereunder. As many of the cylinders D, D', D² and D³, are employed as required, the material being delivered as described from one to the next adjacent one.

By this device the liquid employed in washing the material can be and is retained until the material is completely washed and sized,
40 the manner of working of the device being to separate the finer from the coarser particles, to deliver the coarser into its bin or other receptacle, and to carry the finer particles and the liquid to another screen and
45 there repeat the operation, whereas heretofore the finer particles being separated from the machine employed, first, the coarser particles were separated farther along in the machine, and thereby the finer particles alone
50 were contained in the water while the material was being sized and washed and with such machines the first of the bins A to the left end of the drawing Fig. 1, would receive the finer particles while, with our device, it receives
55 the coarser particles; the next bin would receive a grade coarser while with us, the same bin receives a grade finer material, and so on.

In the modification illustrated in Fig. 4, the shaft G and the arms G' are not used, but in
60 place thereof there is placed on the cylinder D⁴, ring K having thereon gear teeth *k*, *k*, intermeshing with the teeth on a driving gear

K'. And the cylinder D⁴ rests on the revoluble pulleys or wheels L, L, such pulleys L turning on shafts *l*, *l*, respectively. As the
65 cylinder D⁴ is precisely the same as the several cylinders D, D', D², D³, inclusive, except the shaft G and spokes G', being removed from within the cylinder, material of larger size in proportion to the size of the cylinder can be
70 passed through the same.

It is to be understood that the several cylinders vary only in the size of the perforations and that the letterings D, D', D², D³, D⁴, have been given thereto, to avoid confusion
75 in the describing of the device.

The several spouts *b*, I, I', I², and I³, and the spouts or hoods J, J', J², J³, respectively, form conveyers in which the material received thereon, is conveyed to the point of delivery thereof hereinbefore set out, and we do not confine ourselves to the precise shape of such conveyers, or to the exact location thereof as regards distance from the several cylinders, or to the size thereof: it being, however, necessary that the conveyer *b* deliver its contents
85 into the first of the cylinders, that the series of conveyers I, I', I², and I³ extend, respectively, longitudinally underneath the several cylinders sufficiently near and of sufficient
90 size to collect all the material coming through the perforations in the cylinders, and that each of such conveyers must extend to and deliver the contents thereof as hereinbefore stated; and that the conveyers formed by the
95 hoods or spouts J, J', J², J³, respectively, must fully protect the spouts I, I', I², I³, from receiving any of the material passing out of the ends of the several cylinders, and where such conveyers J, J', J², J³, are designed to
100 carry the material delivered into them a distance, that they be of sufficient size, proper shape and suitable construction to receive such material and convey the same as desired.
105

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

In a washing and sizing machine, a main driving shaft having sprocket wheels thereon,
110 a series of rotatable perforated cylinders all driven from said main shaft by chains passing over the sprocket wheels thereon, a pump driven by a chain passing over a sprocket wheel on said main shaft, and a hopper,
115 into which said pump discharges, for feeding material to said cylinders, substantially as described.

EUGENE G. HAMMOND.
EDWARD D. HAMMOND.

In presence of—

CHARLES T. BROWN,
EDWARD M. BARNARD.