

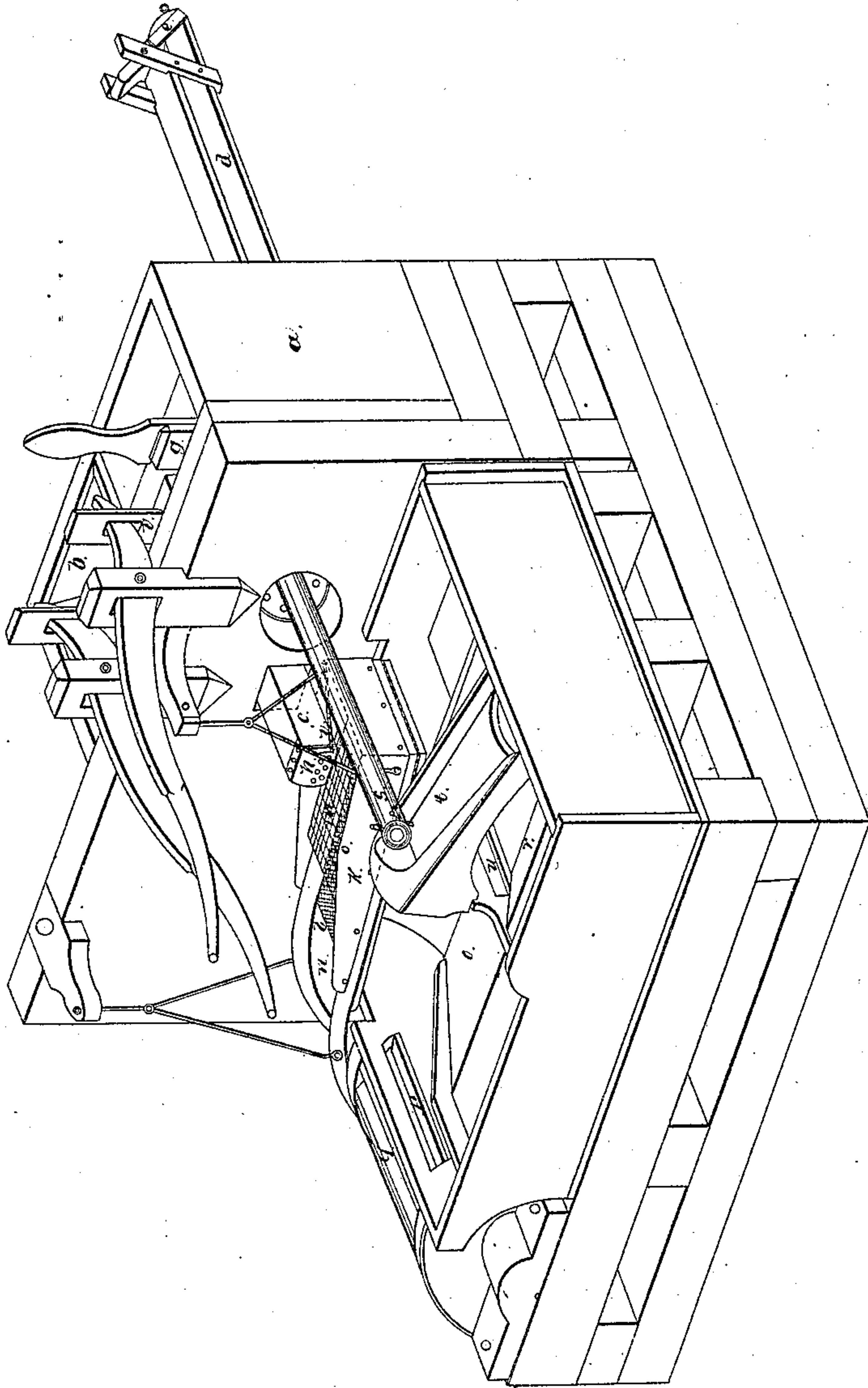
2 Sheets, Sheet 1.

*G. Finley,
Ore Washer.*

N^o 13,164.

Patented July 3, 1855.

Fig. 1.

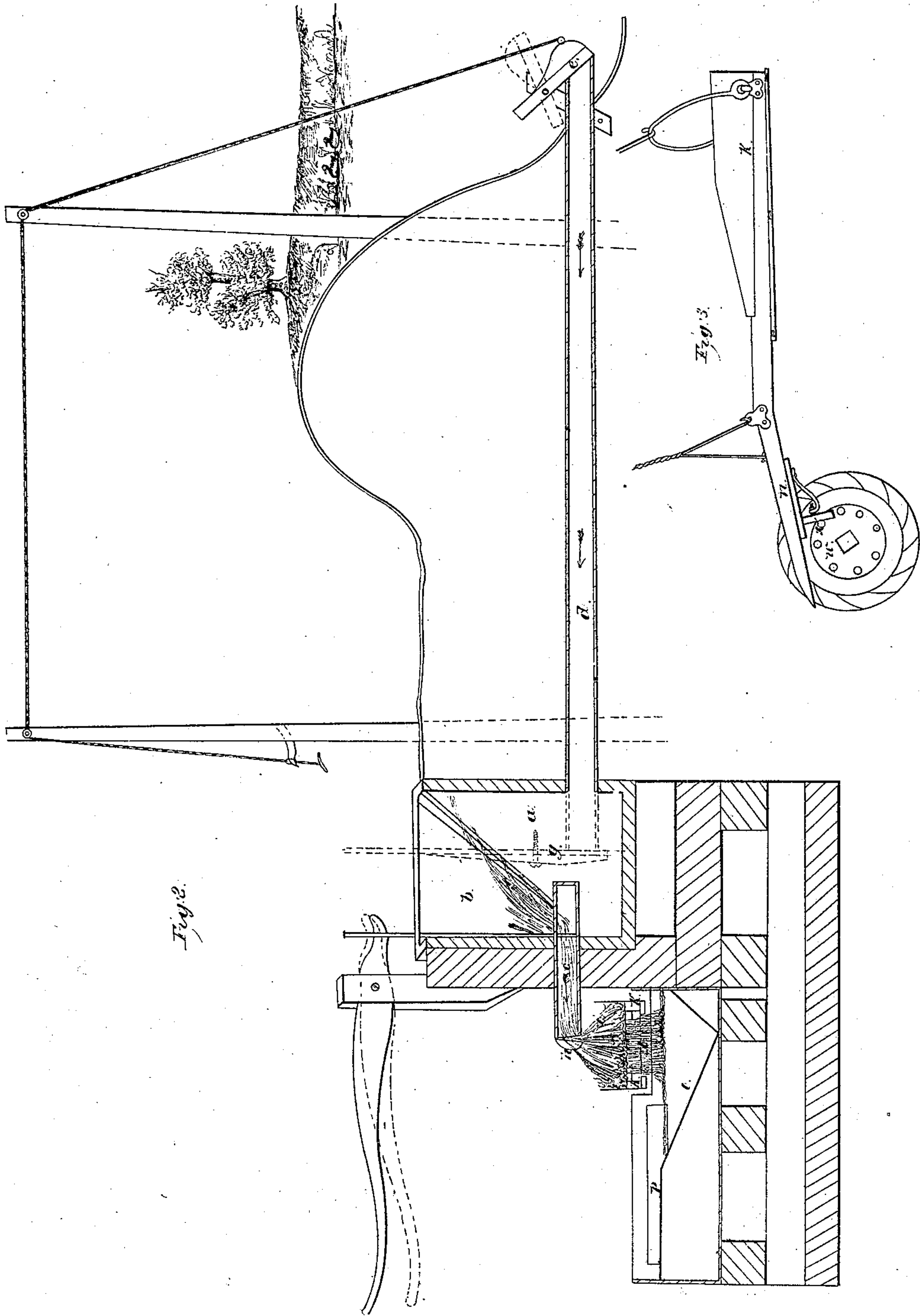


2 Sheets. Sheet 2.

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UNITED STATES PATENT OFFICE.

GEO. FINLEY, OF COLLINS TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA.

MACHINE FOR WASHING SAND.

Specification of Letters Patent No. 13,164, dated July 3, 1855.

To all whom it may concern:

Be it known that I, GEORGE FINLEY, of Collins township, in the county of Allegheny and State of Pennsylvania, have invented
5 a new and useful Improvement in Machines for Washing Sand, so as to Prepare It for Use in the Manufacture of Green Glass; and I do hereby declare that the following is a full, clear, and exact description thereof,
10 reference being had to the annexed drawings, forming part of this specification, in which—

Figure 1 is a perspective view of my machine. Fig. 2 is a sectional side view of my
15 machine exhibiting also the manner in which it is used. Fig. 3 is a side view of the riddle and water wheel, exhibiting the relative position of knocker on the riddle and the cogs on the side of the water wheel.

20 In the several figures the letters of reference denote similar parts of my machine.

The object or use of my machine is to separate from sand as it is dug from the earth, all such substances as roots, clay, pebbles, stones and any soluble matter, so as to
25 purify and cleanse it, and make it suitable for the purpose of manufacturing glass. By means of my machine large beds of sand which are found in many parts of the
30 country and which are comparatively useless may be converted into an article which commands a ready sale wherever the manufacture of glass is carried on.

In order to enable others skilled in the art
35 to make and use my machine, I will proceed to describe its construction and operation.

In the drawings *a*, is the cistern, which is a strong oblong or square box, on one side of this box occupying one half of the cistern
40 is a hopper *b*, which is shaped like an inverted pyramid which terminates in, and communicates with the spout *c*.

The cistern *a* is supplied with water from a reservoir or pond by means of a pipe or
45 conductor *d*, which is laid under ground at such a depth as that the water passing through it will not freeze in winter, and terminates in the reservoir or pond, at or near the bottom or at least some distance below
50 the surface of the water. The other extremity of this conductor *d*, is furnished with a valve *e*, which is weighted so that by its own gravity it lies close over the mouth of the conductor and permits the passage
55 of the water through it. This valve is susceptible of being raised by a chain passing

up out of the water and over pulleys, the end of the chain being within reach of the man having charge of the machine so as to be easily accessible, (see Fig. 2). The conductor enters near its base, and the machine being so placed as to be below the level of the water in the reservoir or pond, the water enters the cistern when the valve *e*, is raised with considerable force. The flood of water
60 into the cistern is regulated by a gate *g*, which covers the interior extremity of the conductor *d*, and may be moved so as to regulate the size of the opening and the consequent flow of water with the exactest precision, thus securing a uniform elevation of the water in the cistern and preventing the water rising so high as to overflow the cistern as it would otherwise do, as the surface of the pond is at a higher level than the top
75 of the cistern. The water enters the hopper through the small holes or perforations in its sides; these holes entering the sides of the hopper with a downward inclination or angle so that the sand thrown into the hopper can not fall through the holes into the cistern the entrance of the water through the holes also preventing it. The end of the spout *c*, which projects from the cistern, is furnished with a jet block *h*, of wood, or
85 other suitable material. This jet block is perforated with holes and is attached to the extremity of the spout *c*, by a hinge of leather. It covers the end of the spout *c*, and a bridle *i*, or gum elastic band connects
90 the bottom of the jet block with the side of the riddle *k*, for the purpose hereinafter specified. A leather bag perforated with holes may be substituted for the block if preferred.
95

The riddle is a long trough which is suspended by chains or ropes, and hangs horizontally, being left free to vibrate lengthwise. This riddle hangs under the jet block at the mouth of the spout *c*. The bottom of
100 the riddle is a sieve of fine brass wire net work *l*, through which the sand can pass, but which will not allow the passage of stones or lumps of clay. Over this fine sieve is placed a loose tray of coarse open wire *m*,
105 strong enough to bear the strain of stones and lumps of clay falling on it. This is placed over the fine sieve to protect it from being destroyed by the coarse lumps and stones falling on it. At the extremity of the
110 riddle *k*, that portion which is not provided with a sieve is covered with boards, or sheet

iron or brass forming an apron or inclined plane *n*, having a rapid curved inclination or dip downward which is designed to carry off the stones and lumps of clay which will not pass through the sieve *l*, delivering them over the ends of the riddle.

Below the riddle *k*, is an inclined plane *o*, placed in a box or trough into the lowest part of which the sand which passes through the riddle settles. This trough is continuously kept full of the water from the cistern. An opening or weir *p*, in the side of the trough allows the water to pass off, which falling on the buckets of the water wheel *q*, causes the wheel to revolve. On the same shaft with the water wheel and under the apron *u* is a small cog wheel *w*. Under the apron *u*, of the riddle *k*, is a short steel or iron point, or knuckle *x*, which projects perpendicularly downward and comes in contact with the points projecting from the small wheel. The effect of this is to draw the suspended riddle *k*, backward, each time that a point of the wheel comes in contact with the knocker and as soon as the knocker is released the riddle *k*, falls back by its own gravity, thus producing a bumping motion or series of jerks, the effect of which is to discharge the refuse of the washing over the apron and to pass the sand through the meshes of the sieve.

On the opposite side of the machine from the water wheel is another inclined plane in a trough *r*, in which the sand receives its final washing with clean water, which is supplied from the cistern *a*, by a pipe or tube *s*, down a gutter *t*. The water from this finishing trough passes into the first trough *o*, through an opening *u*, and thence out over the water wheel.

By my plan of drawing the water used in my machine from the bottom of the reservoir I am enabled to wash sand during the coldest weather in winter, the temperature of the water drawn from the bottom of the pond being so much above freezing point that the water not only does not freeze when passing through the machine but melts away ice which may have collected on it and prevents the stoppage of the machinery which would otherwise occur.

Having thus described the construction of the several parts of my machine I will proceed to explain more particularly their use and operation.

The crude sand as it is dug from the ground being deposited near to the hopper ready to be washed, the operator by drawing the chain raises the valve *e*, at the ex-

tremity of the conductor *d*. The water then rushes into the cistern the gate *g*, being opened to admit of its entrance and filling the cistern passes through the perforations in the hopper and runs through the spout *c*, filling the first trough *o*, and passing over the water wheel. The revolutions of the water wheel causes the riddle *k*, to commence its oscillations, which is the signal for the operator to commence throwing sand into the perforated hopper *b*. The sand is carried through the spout *c*, the sliding valve being opened and through or under the jet block *h*, which is kept continually in motion by the jerking of the riddle *k*, to which it is connected by the elastic bridle *i*. This motion of the jet block causes the water to squirt out of the sides of the jet block when closed or to fall in a larger and more direct stream when open and at all times to jet out of the perforations, thus distributing the water charged with sand over the whole surface of the sieve while any breakage of the jet block by the passage of a large lump of clay or stone is effectually prevented by the elastic nature of the bridle *i*. Any stones or lumps of clay which cannot pass through the sieve *l* or the upper tray *m*, are carried over the apron *n*, while the sand and small portions of clay pass through the riddle into the first trough *o*, the sand settling at the bottom of the inclined plane. From thence it is drawn up the inclined plane in the trough *o*, through the water on a level space at the top of the inclined plane above the water level and from thence it is thrown by a shovel into the second trough *r*. This trough is supplied with clear water from the cistern by the pipe *s*, which is admitted by opening the sliding valve *v*, by which the amount of the discharge is regulated. The sand then drawn up the inclined plane in the second trough *r*, on to the level space above the water level and is there fully washed and ready to be thrown into piles to drain off the water and when dry is ready for market.

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

The use of the jet block or its equivalent for the purposes of distributing the sand and water over the surface of the sieve, in the manner and for the purposes hereinbefore set forth.

GEO. FINLEY.

Witnesses:

WILLIAM DAY,
N. BUCKMASTER.