S. FRIEND.

SAND AND GRAVEL SEPARATOR.

No. 180,569. Patented Aug. 1, 1876.

Fig 1

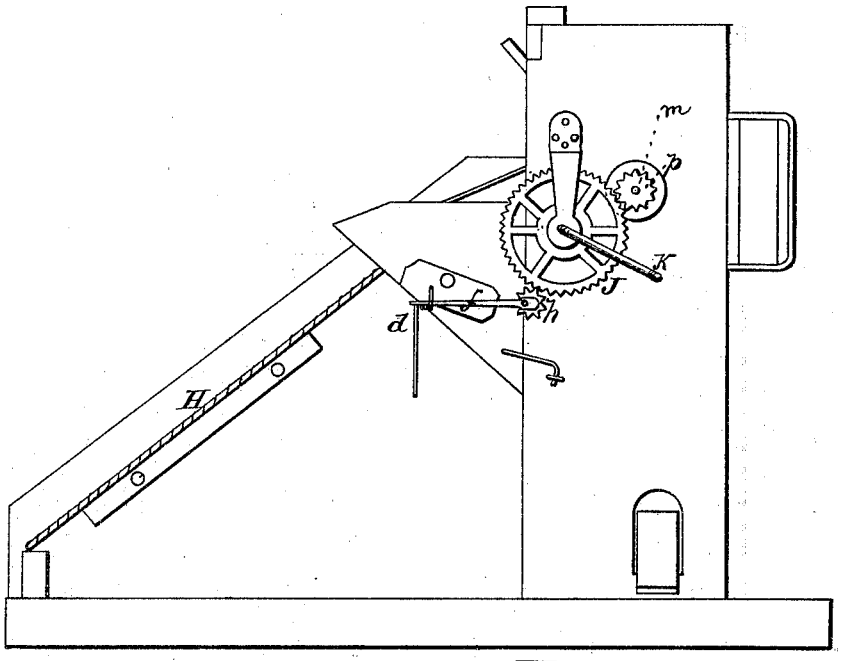
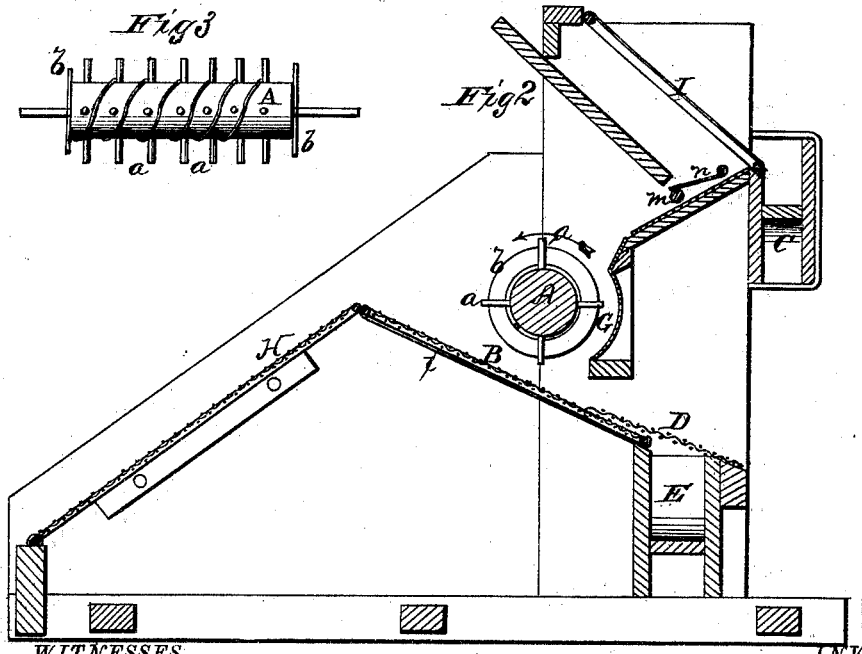


Fig 3

Fig 2



WITNESSES

Franck L. Durand.

C. L. Everett

INVENTOR

Saml. Friend

By Alexander Hudson

Attorneys.

UNITED STATES PATENT OFFICE.

SAMUEL FRIEND, OF DECATUR, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO WM. B. CHAMBERS AND WM. J. QUINLAN, OF SAME PLACE.

IMPROVEMENT IN SAND AND GRAVEL SEPARATORS.

Specification forming part of Letters Patent No. **180,569**, dated August 1, 1876; application filed June 13, 1876.

To all whom it may concern:

Be it known that I, SAMUEL FRIEND, of Decatur, in the county of Macon and in the State of Illinois, have invented certain new and useful Improvements in Sand or Gravel Separators; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a machine for separating sand and gravel, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is a longitudinal section of the same. Figure 3 is a side view of the cylinder.

The object of this invention is to furnish a machine that will screen sand, wet or dry, with rapidity and greater ease than by any other way, producing a more even, regular, and merchantable quality of sand, which does not require a second screening after passing through the separator. Sand screened by this separator can be mixed with loam or clay as may be required by manufacturers, plasterers, and masons for their purposes.

The difficulty in screening sand when wet or damp is caused by the sand sticking fast to the gravel, and cannot be screened by any of the machines now generally in use, except at considerable labor and expense, and loss of time.

By the construction of the rotating cylinder A such difficulties are overcome. The cylinder, having four rows of teeth, *a*, and revolving with speed, knocks all the sand loose from the gravel and rock before striking the screen B underneath. At each end of the cylinder A is a circular disk or flange, *b*, which revolves with the cylinder to keep the sand from getting into the journal-bearings of the cylinder. To prevent the screen B from clogging or caking, a rod, *d*, is pivoted to one side of the frame of the machine, and the outer end of this rod is struck by an arm, *f*, which is placed on a wrist-pin on a pinion, *h*, upon the journal of the cylinder A. The arm *f*, striking on the outer end of the rod *d*, causes the inner end thereof to beat against rods *i i* under the screen B. These rods being full of play, the flow of sand from the cylinder A is whipped through by the rod *d*.

The machine is so constructed that the cylinder A carries over out of the way, beyond the rear of the machine, a large portion of the rock, the remaining portion sliding down the chute C and to one side of the machine in a wheel-barrow or box. The roofing-gravel passes down the screen B, and over another screen, D, and drops into the spout E screened, and out at the other side of the machine. Back of the cylinder A is a curved or dished guide, G, which regulates the pitch of the sand, and prevents the gravel and rock from falling down behind the teeth *a*.

Above the cylinder is a rotating roller, *m*, which acts as a feeder. It being square or polygonal the sand drops or slides down on this roller. It spreads the sand and throws it forward on the cylinder A. On the feeder or roller *m* rests a hinged plate, *n*, to prevent the sand from sliding under the roller. This plate also acts in assisting the same to pass through regularly.

In the rear of the machine is an inclined screen, H, which catches all the waste sand that falls from the rocks as they pass over, and this screen acts as a cover to prevent the rock or gravel from mixing with the sand. It is fastened at the lower end with staples or hinges, so that it can be raised or lowered as required in taking out sand.

One or more rod screens, I, are placed at the top of the frame, which the sand first strikes, in order to catch the largest rocks as they slide off in the box-screen C hanging in front of the frame.

With this machine all gravel and rock are carried out of the way without any additional expense.

On the side of the machine is mounted a cog-wheel, J, provided with a crank, K, and this wheel meshes with the pinion *h* for rotat-

ing the cylinder, and also with a pinion, *p*, on the journal of the roller *m*, for rotating the same.

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

1. In a sand-and-gravel separator, the rotating, spreading, and feeding square or polygonal shaped roller *m*, and the hinged plate *n*, having its free edge resting on said roller, as and for the purposes set forth.

2. The combination of the rod screen or screens I, chute C, hinged plate *n*, and square or polygonal rotating roller, substantially as and for the purposes herein set forth.

3. The rotating cylinder A, provided with the teeth *a* and flanges *b*, in combination with the guide G and screens B H, substantially as and for the purposes herein set forth.

4. The combination of the screen B having rods *i i*, the beater *d*, arm *f*, and crank-pinion *h*, substantially as and for the purposes herein set forth.

5. The combination of the screens B, H, and D, and box E, with the rotating cylinder A, having teeth *a* and flanges *b*, all substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of May, 1876.

SAMUEL FRIEND.

Witnesses:

J. H. PHILLIPS,

W. M. BOYD.