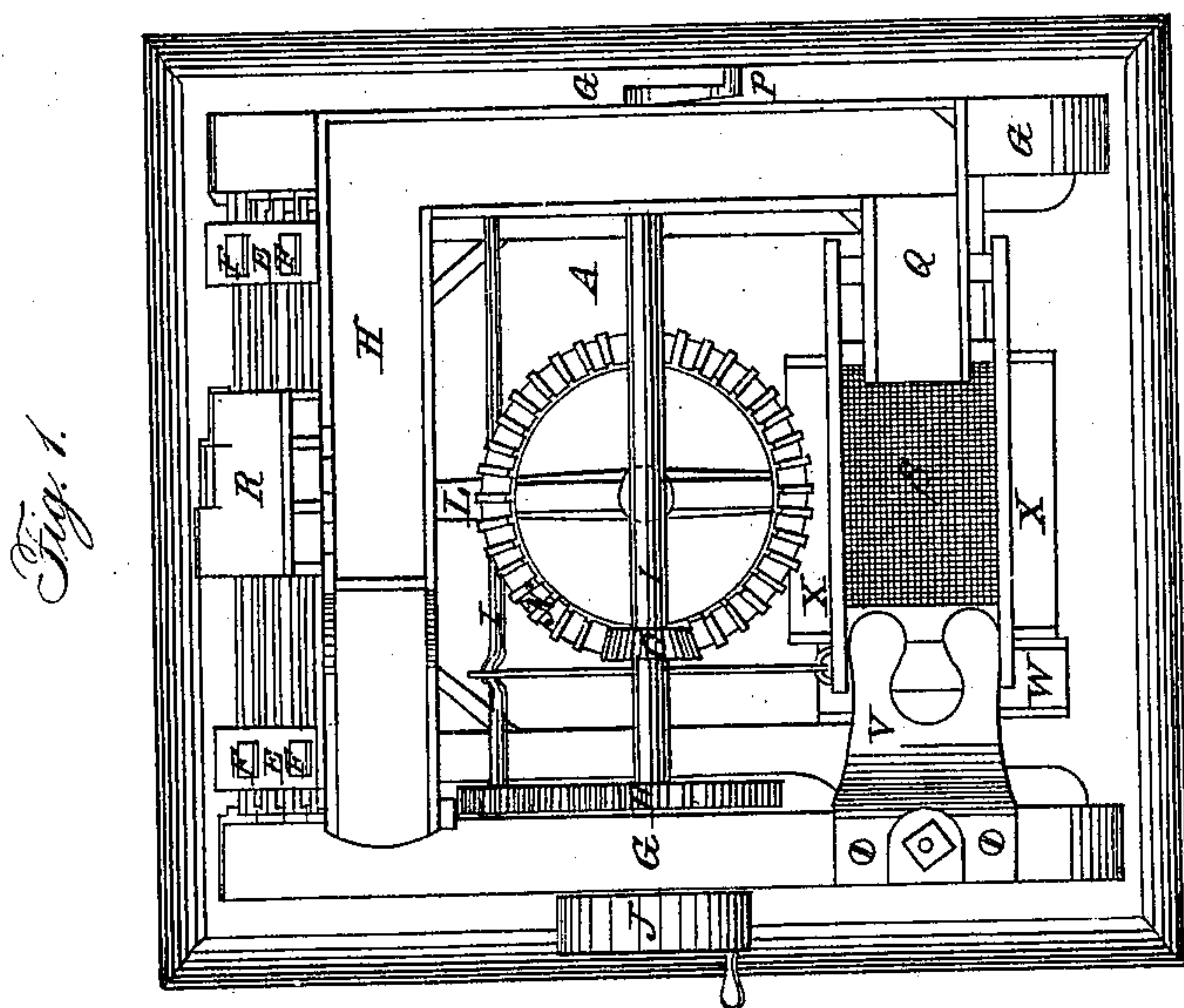
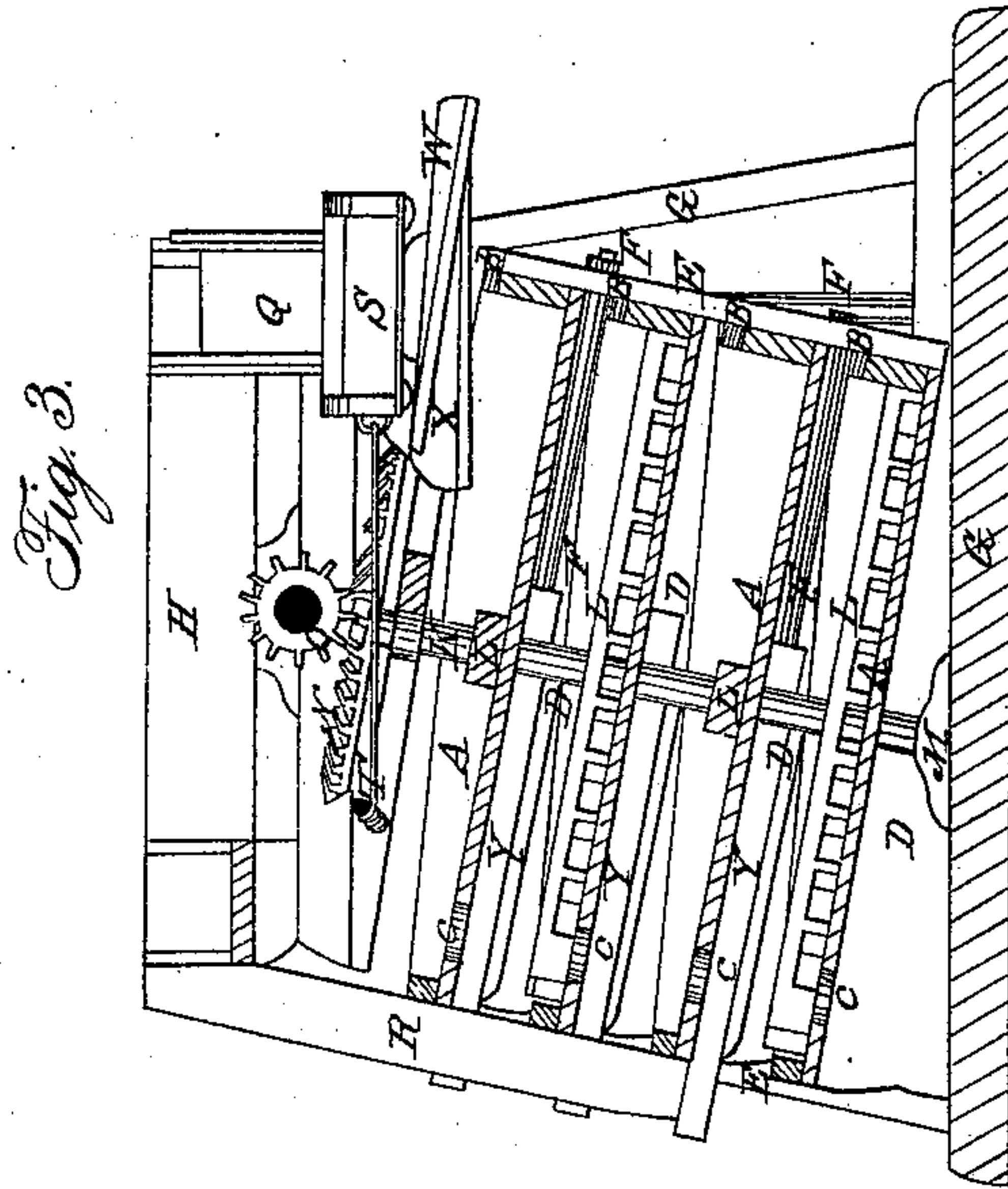
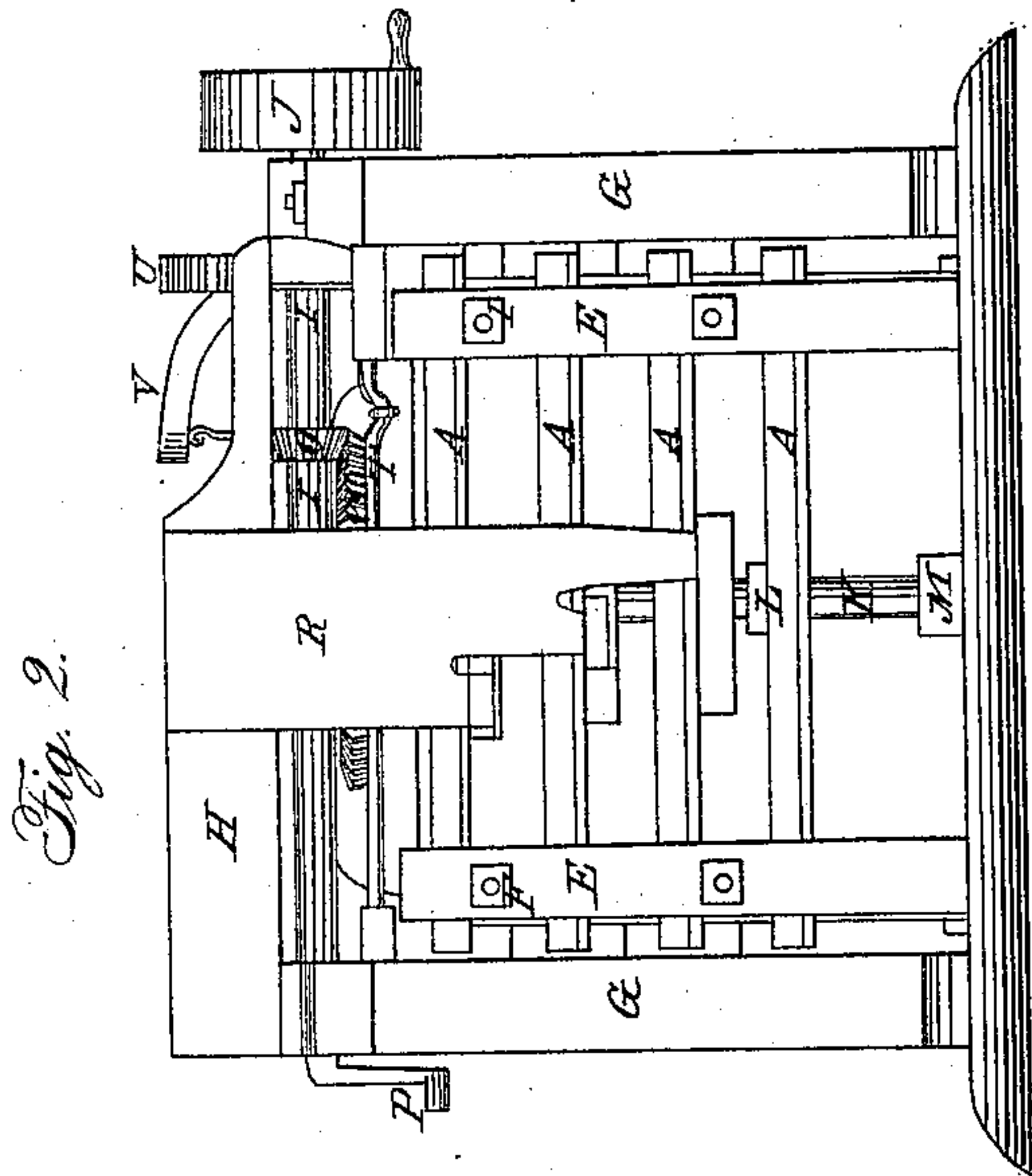


D. L. FURNIER.  
Sand Washer.

No. 62,833.

Patented Mar. 12, 1867.



Witnesses:

Philip C. Dieterich  
Thos. T. Parker

Inventor:

David L. Furnier  
By his atty  
R. D. Smith



# United States Patent Office.

DAVID L. FURMER, OF ROSTRAVER, PENNSYLVANIA.

*Letters Patent No. 62,833, dated March 12, 1867.*

## IMPROVED MACHINE FOR WASHING SAND AND OTHER MATERIALS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, DAVID L. FURMER, of Rostraver, in the county of Westmoreland, and State of Pennsylvania, have invented a new and useful improvement in Sand-Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my machine.

Figure 2 is a rear elevation of the same.

Figure 3 is a sectional elevation on the line *x x*.

My invention consists in constructing a sand-washing machine with a series of washing trays, situated one above another in the same frame, mounting them in an inclined position, passing a shaft through the centres of the several trays, upon which are mounted stirrers, to agitate the sand and water within the tray, and continually move the sand towards the highest part thereof, where it is discharged into the tray beneath, and in introducing to each tray, separately, a stream of pure water, while the water with the earthy matters taken up is discharged over a suitable waste-way.

That others may understand the construction and operation of my machine, I will particularly describe it.

A A are the trays in which the process of washing is carried on. These trays are constructed with the side-piece on the back much narrower than the side-piece on the front, so that, as the tray stands with its bottom inclined, as represented in fig. 3, the upper edges of all of the side-pieces will be about level. In the upper edge of the side-piece, at the front, I make a small waste-way by cutting a notch, B, in the upper edge of said side-piece, to permit the muddy water to escape directly from the machine. And through the bottom of the tray, on the opposite or upper side, I make an oblong hole, C, through which the sand is discharged into the tray below. For convenience of construction I make each tray in two parts, divided across from side to side, through the centre of the hole through which the shaft passes, so that either or all of the trays may be removed without disturbing the shaft which operates the stirrers. When the machine is set up, they are placed one above another, with the wedge-shaped blocks D D between them at each side, so as to keep them equidistant, and their bottoms parallel. By placing them, also, with the front side all on the same line, as shown in fig. 3, the upper trays will discharge clear of those below, so that muddy water from one will not find its way to the tray beneath. When the trays are in position the strips E E are placed, and the rods F F are passed through from front to rear, and the whole bound firmly together by screw-nuts upon the ends of said rods. The frame G G surrounds the whole, and supports the water-trough H and the operative mechanism, of which the shaft I, with the pulley J, are the prime movers. The main shaft K, upon which the stirrers L are mounted, stands upon the step M under the centre of the machine, and perpendicular to the surfaces of the tray bottoms. At the upper end of this shaft is the bevel-wheel N, which gears with the driving-pinion O upon the shaft I. The stirrers L are arms, sufficiently long to reach nearly across the internal diameter of the tray. They are provided on their under sides with oblique vanes or wings, and are hung upon the shaft K at about the centre of length. When the shaft K is caused to revolve, by reason of movement being imparted to the shaft I, the stirrers L are moved along the surface of the tray bottom, the oblique vanes upon their under sides continually moving the sand away from the centre, where it is constantly being received. The trough H is located upon the top of the frame G. Into this trough is discharged the water elevated by pumps or received from some natural reservoir. If pumps are used, they may be operated by the crank P, or by some other suitable or convenient means. At one end of the trough H is the chute Q over which the water flows into the upper tray, and at the other end the spouts R, which convey water from the trough to each of the lower trays; said spouts being as many in number as the number of trays, less one. Beneath the chute Q is the shaking screen S, agitated by the counter-shaft T, which receives motion from a driving-wheel, U, upon the shaft I, or it may be shaken by some other arrangement of devices, if more convenient. That end of the screen S which is beneath the chute Q is hung upon a pivot, and the opposite end is suspended by rods or wires from the bracket V, so that it may swing freely. The sand is shovelled upon the screen S, and at the same time water pours upon it over the chute Q, and the whole is agitated by the means described, so that all particles above the size which will pass through the screen will be excluded, and finally discharged over the end thereof into the waste spout W, and be thrown



out of the machine. The action of the water, in conjunction with the agitation of the screen, separates the sand from the earthy matters with which it is mixed before reaching the trays, so that the stirrers have only to perfect the division by depositing the sand in one place and the earthy matters in another. When the sand, earth, and water pass through the screen they fall upon the board X, which is inclined so as to discharge them into the tray at about its centre, from which time they are subjected to the action of the stirrers until the sand is washed perfectly clean. The oblique vanes of the stirrers continually move the sand about upon the bottom of the trays. It is first moved from the centre towards the outer edges, and from the higher to the lower part. The tray is filled with water to the level of the waste, and fresh water is continually poured in so that there is a constant current flowing out over the waste. The stirrers continually agitate this body of water, inducing it to receive in suspension and convey away the earthy matters which were mixed with the sand. As the sand accumulates in the upper tray, the stirrer gradually moves some of it around toward the upper side, and, finally, at each revolution, some is drawn up and falls through the hole C into the spout Y, which receives water from the spout R, and thence conveys the sand and this pure water to the centre of the next tray, where it is again discharged and submitted to the same action of the stirrer and water. Considerable earthy matter will be discharged from the upper to the tray next below. A less quantity will reach the third, and so on, until, when discharged from the lowermost tray, the sand will be practically pure and clean.

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

The combination of the inclined trays A A and stirrers L L, constructed and acting conjointly, substantially as and for the purpose set forth.

The combination of the inclined trays A A and spouts Y Y, or their equivalents, to supply each tray separately with pure water, substantially as and for the purpose set forth.

The trays A A, when located one above another, and pierced centrally by the shaft K, upon which the stirrers are located, so as to wash and re-wash the sand without re-handling the same, and without occupying more space than the area of one tray requires, substantially as set forth and described.

The agitating screw S, in combination with stirring mechanism of a sand-washer, to comminute the sand and earthy matters before being submitted to the action of said stirring mechanism, substantially as set forth.

The trays, stirring mechanism, water-spouts, screen, driving-gear, and framework herein set forth and described, to form a machine for washing and cleansing sand of the earthy matters usually mixed with it.

DAVID L. FURMER.

Witnesses:

HARVEY B. FRYE,

JOHN C. CUNNINGHAM.