

(No Model.)

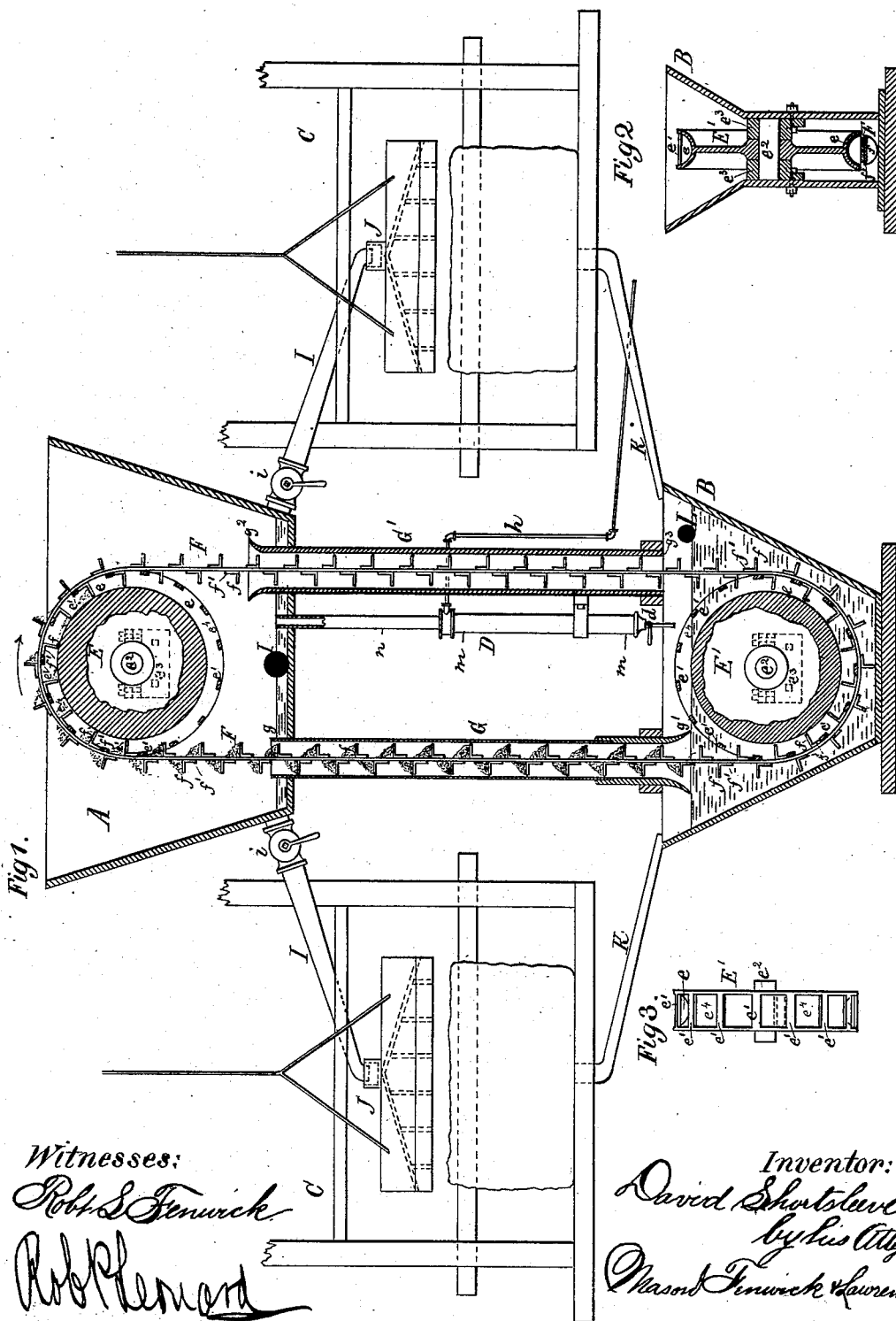
2 Sheets—Sheet 1.

D. SHORTSLEEVE.

# SAND FEEDING MECHANISM FOR STONE SAWING MACHINES.

No. 347,388.

Patented Aug. 17, 1886.



*Witnesses:*

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Robb Leonard

*Inventor:*

Inventor:  
David Shortleive  
by his Atty  
Mason Fenwick Lawrence

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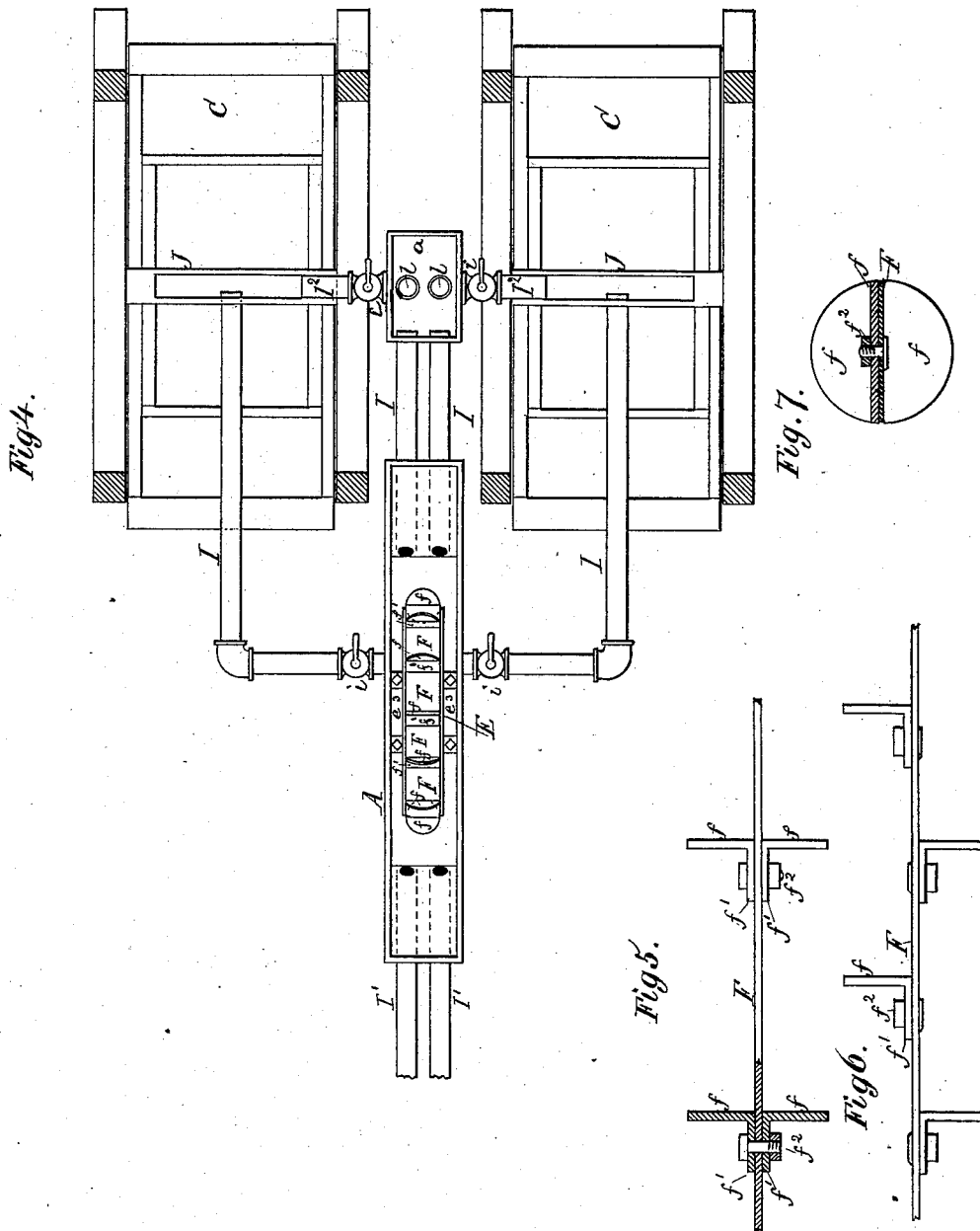
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# UNITED STATES PATENT OFFICE.

DAVID SHORTSLEEVE, OF RUTLAND, VERMONT, ASSIGNOR TO EDMUND A. MORSE, OF SAME PLACE.

## SAND-FEEDING MECHANISM FOR STONE-SAWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 347,388, dated August 17, 1886.

Application filed February 27, 1886. Serial No. 193,458. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID SHORTSLEEVE, a citizen of the United States, residing at Rutland, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Apparatus for Feeding Sand and Water to Stone Machinery; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines by which sand and water are conveyed from troughs or sand and water receptacles to stone-sawing machines, and back again to the troughs or sand and water receptacles, the process being continually repeated; and it consists in certain constructions and combinations of parts, as hereinafter fully described and specifically claimed, whereby such machines are greatly improved in their operation.

In the drawings illustrating my invention, Figure 1 is a view of the main parts of the machine, some parts being shown in elevation and others in section, and the machine being also shown in connection with portions of two stone-sawing machines. Fig. 2 is a vertical transverse section of the lower trough or sand and water receptacle and the belt-wheel around which the elevating sand-and-water belt of the machine passes. Fig. 3 is a front elevation of the sand-and-water-elevating belt-wheel. Fig. 4 is a top view of a modified construction of my invention. Fig. 5 is an enlarged view of a portion of the sand-and-water-elevating belt with lifters, one of said lifters and adjoining portion of the belt being shown in section; and Fig. 6 is also an enlarged view of a portion of a sand-and-water-feeding belt with lifters, showing the lifters on one side of the belt arranged alternately with respect to those on the opposite side; and Fig. 7 is a perpendicular section of the belt with lifters.

A in the drawings represents an upper trough or box for receiving and distributing sand and water. B is a lower trough or box for supplying sand and water to the upper trough or box; also for receiving return sand and water from stone-sawing machines C C, and from an overflow-pipe, D, of the upper trough or box. The upper and lower troughs or

boxes, A B, are respectively provided with a lifter-belt wheel, as E E', around which a lifter-belt, F, runs. This belt F is provided with semicircular flanged lifters *f*, (see Figs. 2 and 7,) the flanges *f'* of which are fastened by bolts *f''* to the belt, as seen in Figs. 5 and 6. These semicircular lifters *f* may be arranged opposite each other, as in Fig. 5, or in alternate order, as in Fig. 6, the latter being the more advantageous because of the greater pliability of the lifter-belt in going through the pipes, tubes, or guides G G'. The lifter-belt wheels E E' are provided with annular grooves *e*, of semicircular shape, so as to freely receive the semicircular lifters *f*, as illustrated in Fig. 2, on the inner side of the belt. At intervals corresponding with the distances between the semicircular lifters *f* the lifter-belt wheels E and E' have their semicircular grooves *e* crossed by straight transverse bars *e'*, which are flush with the peripheries of the wheels, as seen in Figs. 1, 2, and 3. By means of these transverse bars and perimeter edges of the belt-wheel a broad bearing for the belt is formed, and at the same time openings or spaces *e''* between these bars permit the inner lifters to enter the groove *e* of the wheel far enough to insure an impingement of the bars against the ends of the flanges *f'*, and thereby effect the propulsion of the belt when either the wheel E or wheel E' is turned around on its axis. The upper wheel, E, is the best adapted for the power or driving wheel, and is therefore connected, by means of pulleys and belts, or by other known means, to the power-supplying machinery of the shop. If desired, both wheels may be geared together and driven positively at same rate of speed. Both wheels E E' are provided with shafts *e''* of hard chilled metal, the journal-bearings *e'''* of which are also made of hard chilled metal, in order to prevent too rapid wear by the action of the sand, which is liable to come in contact with said bearings. The ascending portion of the belt F and the semicircular lifters *f*, attached thereto, are loosely inclosed by a pipe or tube, G, the upper termination, *g*, of which is at a suitable height above the bottom of the upper trough or box, A, while its lower terminus, which is flaring, as shown at *g'*, is as close as practicable to the lower wheel, E', in

the lower trough or box, B. The descending portion of said belt, with its semicircular lifters, is loosely inclosed by a pipe or tube, G', the upper termination,  $g^2$ , of which is flaring, in order to facilitate the entrance of the descending semicircular lifters, and is sufficiently above the bottom of the upper trough or box to prevent overflow into it of the contents of the trough or box, while its lower termination,  $g^1$ , is about on a line with the top of the lower trough or box, B. Both of the pipes or tubes G G' are suitably fastened to the upper and lower troughs or boxes.

The upper trough or box, A, is provided with an overflow-pipe, D, by which a portion of the sand and water elevated into it by the belt of lifters may be conducted to the lower trough or box in case the supply in the upper trough or box is greater than the demand of the number of sawing-machines which may at the time be in use. This overflow-pipe is made with a bore of different diameters, its lower portion,  $m$ , being larger in diameter than its upper portion,  $n$ , in order that room may be afforded for sand to collect below the mouth of the drain-pipe  $h$ , while the muddy water is allowed to flow off through said drain-pipe above the accumulated mass of sand, and at the bottom of this overflow-pipe a cock,  $d$ , may be provided, by which the discharge into trough or box B is regulated or entirely cut off, according to the requirements of the stone-sawing machines supplied by the sand-and-water feeder. When it is desirable to deliver the sand of the overflow into trough B as free as possible from water, the cock  $d$  may be partly opened, so as to allow a very small passage for the sand, and thus cause the sand and water to accumulate to a certain height above said cock, and at this height a branch pipe,  $h$ , may be connected with the overflow-pipe D, through which the water may be allowed to flow off and be conducted away from the machine.

To or near the bottom of the upper trough, A, conduit-pipes I are attached, which convey sand and water to the stone-sawing machines C, and in order to regulate the supply they are provided with valves or cocks  $i$ . The sand and water are delivered by said conduit-pipes into ordinary distributing-boxes, J, of the stone-sawing machines, and therefrom discharged upon the stone in the ordinary manner. From the stone-sawing machines the used or refuse sand and water are conducted by conduits K to the lower trough or box, B, which at a suitable height is provided with an overflow, L, whereby the dirty water is drawn off.

In Fig. 4 is shown an arrangement of conduit-pipes I' which will in some cases answer better than the conduit-pipes I. If desirable, however, both arrangements may be used together, as illustrated. These conduit-pipes I' are angular and lead directly to the stone-sawing machines, while the conduit-pipes I

lead to a small reservoir,  $a$ , with suitable overflow,  $l$   $l$ , and connecting-pipes I', leading to the stone-sawing machines, as shown. The connecting-pipes I' and conduit-pipes I are provided with cocks  $i$ , for regulating the supply of sand and water to the stone-sawing machines. When the sand-and-water-feeding apparatus is at work, the upper lifter-belt wheel, E, revolves in the direction indicated by an arrow, the inner lifters enter into the groove  $e$ , and the transverse bars  $e'$  of the wheel E interlock with and push the flanges  $f'$  of the semicircular lifters  $f$  before them, and thus cause the said belt F to revolve with the wheel. As the belt F revolves its lifters pass out of the groove  $e$  and descend into the pipe or tube G', the flaring top  $g^2$  of the same permitting the semicircular lifters  $f$  to enter said pipe readily, and without detention, by incidentally touching said pipe or tube. On leaving the lower termination of said pipe or tube G' the lower portion of the belt F, with its lifters, becomes submerged in the sand and water of the trough B, and moves under the lower wheel, E', revolving it by either positive or frictional contact of the belt F and lifters  $f$  with the bars  $e'$ . In the passage of the belt under the wheel E', which has comparatively large openings between its bars  $e'$ , for the admission of sand and water into its annular groove  $e$  as it revolves, the semicircular lifters  $f$  on the inner side of the belt F are charged with sand and water. The lifters on leaving the groove  $e$  of the wheel E' are successively supplied with sand and water, while at the same time the semicircular lifters  $f$  on the outer side of the belt F are supplied by ascending through the sand and water surrounding the wheel E'. As the ascending semicircular lifters leave the sand and water of the lower trough or box, B, they are immediately entered into the pipe or tube G, in order to prevent any escape of the sand and water carried by them. The lower flare,  $g^1$ , of the pipe or tube G serves the same purpose as the upper termination,  $g^2$ , of the pipe G', above described. The pipe or tube G is made to fit the semicircular lifters more snugly than is the case with the pipe or tube G', in order to prevent the sand and water on the said semicircular lifters falling off, and to render the belt of lifters more pliable in the event of the lifters incidentally encountering a slight friction against the pipe and causing a jerk on the belt F, which would interfere with its smooth motion, I prefer to arrange the lifters alternately, as shown in Fig. 6, instead of opposite each other, as in Fig. 5. On leaving the pipe or tube G the semicircular lifters  $f$  on the inner side of the belt F become again engaged with the upper wheel, E, in the manner previously described, and the sand and water upon them are, as the belt revolves upon the wheel E, gradually discharged through the openings  $e'$  into the annular groove  $e$ , they leaving  $e$  through said openings when

they reach the downward side of the wheel E, and thereby falling into the trough or box A, as shown, and while said operation is taking place the sand and water upon the semicircular lifters on the outside of belt F are also discharged gradually into the trough or box. If desired, the upper portion of the upper wheel, E, and belt may be suitably housed to prevent splashing of sand and water while the machine is in motion. As a portion of the sand is continuously being ground fine between the stone-saws and stone, and consequently rendered useless, this consumption is compensated for by occasionally throwing a few shovelful of sand into the hopper trough or box B, which latter is supplied with a proper quantity of clean water in the usual way, in order to compensate for the dirty waste water discharged through the overflow L. While the belt F is passing over the wheels E and E' the semicircular lifters *f* are kept in line by annular grooves *e* of the wheels, and thus the belt is prevented from running off the wheels.

The belt F may be made of any suitable material—such as hemp, leather, rubber, iron, or steel—and instead of a flat belt a round one may be employed for carrying the lifters.

What I claim is—

1. The combination, with a trough or box, A, of an elevating-belt, F, having buckets or lifters *f* attached to both its sides, and a wheel, E, having an annular groove, *e*, and spaced transverse propelling-bars *e'*, which are at the top of the groove, and serve as a support for the belt across the groove, substantially as and for the purpose described.

2. In a sand-and-water-feeding machine for stone-saws, the combination of the upper and lower troughs, A and B, connecting-tube G, between the troughs, wheels E and E', arranged, respectively, in the said troughs, belt F, having lifters *f* on both its sides, and arranged to travel through trough B, tube G, and trough A, distributing-pipes I, connected to trough A and having cocks *i*, and extended to the distributor J of the stone-sawing ma-

chine, substantially as and for the purpose described.

3. The combination, with the upper trough, A, and the lower trough, B, of a sand-and-water-feeding machine for stone-saws, of the overflow-pipe D, connected with the upper trough and discharging into the lower trough, and provided with a waste-pipe, *h*, between its upper and lower ends, substantially as and for the purpose described.

4. The combination, with the upper trough, A, and lower trough, B, of a sand-and-water-feeding machine for stone-saws, of the vertical overflow-pipe D, connected to the upper trough, A, and discharging into the lower trough, B, said troughs being connected by pipes, as G and G', through which the elevating-belt travels, substantially as and for the purpose described.

5. The combination, with a sand-and-water feeder, of an overflow-pipe, D, having different diameters, and provided with a discharge between its upper and lower ends, and with a cock, *d*, at its lower end, substantially as and for the purpose described.

6. The combination of the upper and lower troughs, A and B, connected by tube G, overflow-pipe D, connected to trough A, and discharging into trough B, the belt F, having lifters *f*, and passed around operating-wheels E E' in said troughs, and through tube G, the distributing-pipes I', having cocks *i*, and connected to the trough A, the reservoir *a*, located between the trough A and the stone-sawing machines, the distributing-pipes I'', having cocks *i*, and connected, respectively, with the trough A and reservoir *a*, and the overflow-pipe *h*, connected with the reservoir *a*, and discharging below the same, all substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID SHORTSLEEVE.

Witnesses:

M. J. FRANCISCO,  
W. A. CLARK.