(No Model.)

2 Sheets—Sheet 1.

A. E. NORTH & W. K. SHELDON.

MACHINE FOR CUTTING STONE.

No. 336,256. Patented Feb. 16, 1886.

Fig 1.

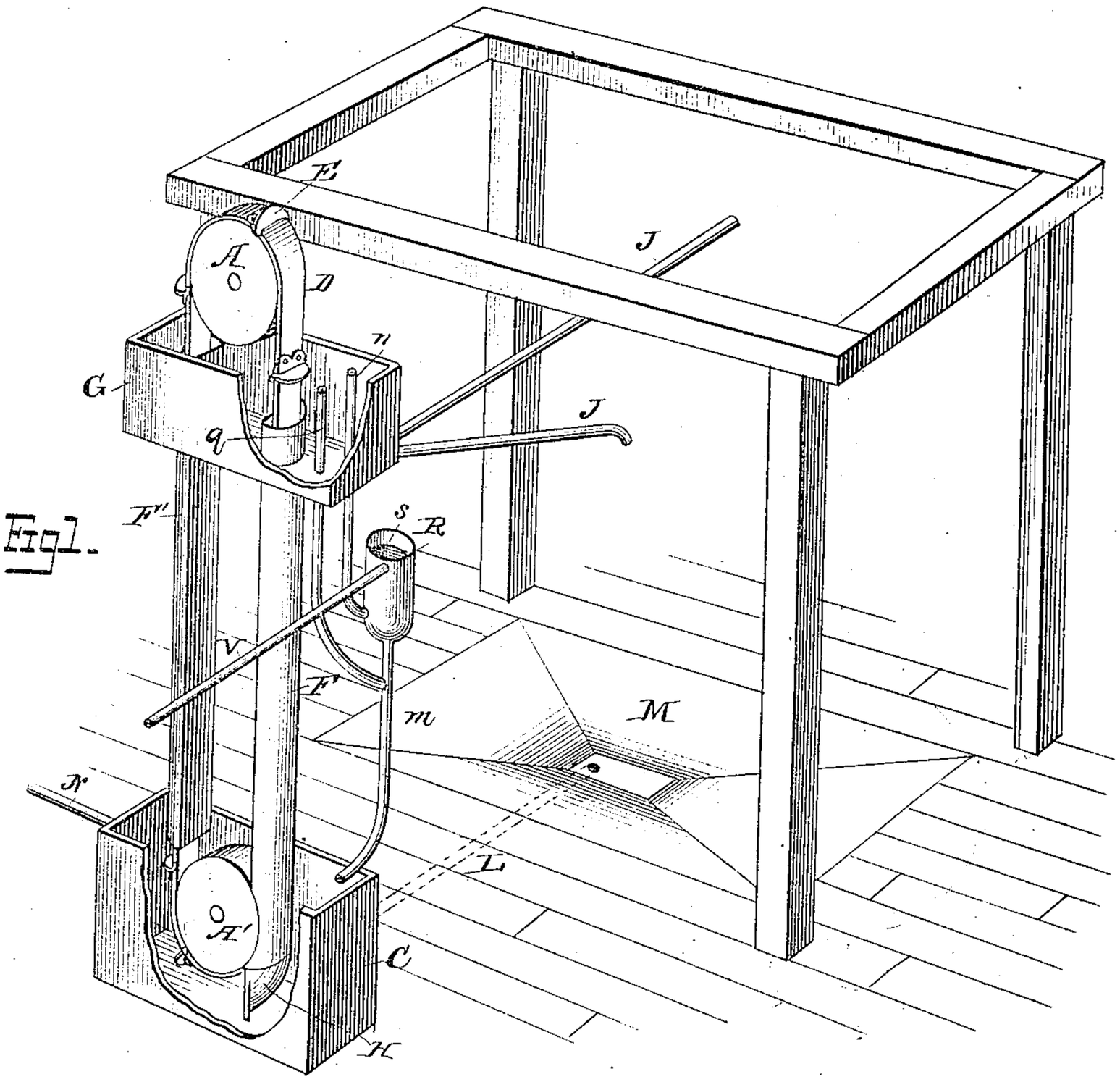


Fig 3.

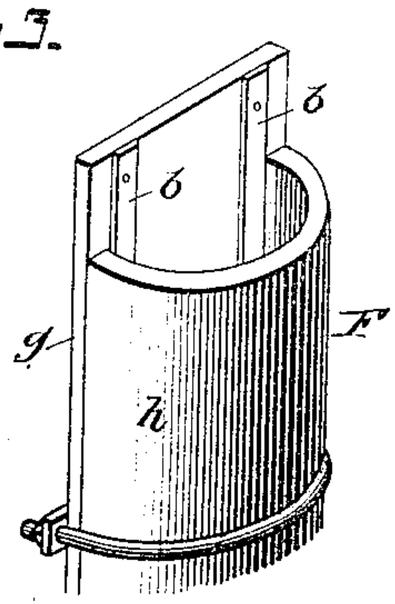


Fig 4.

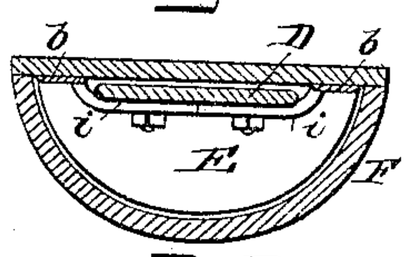


Fig 5.

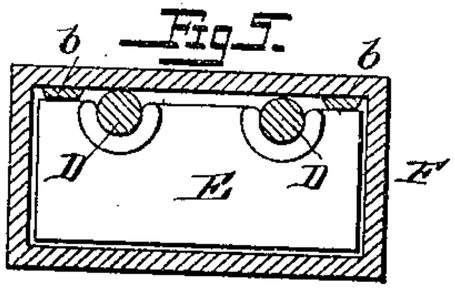
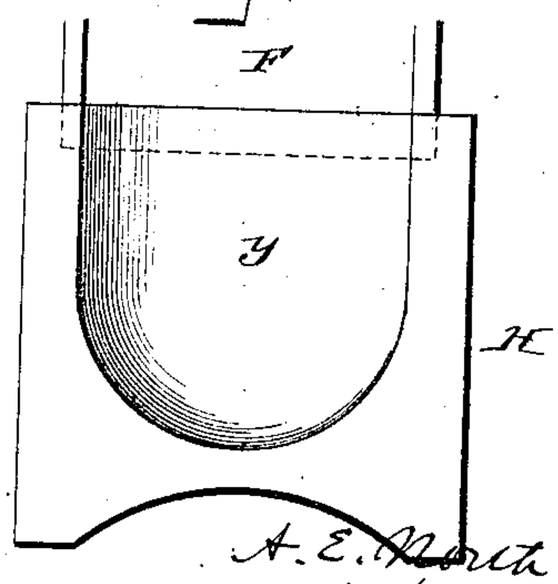


Fig 6.



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(No Model.)

2 Sheets—Sheet 2.

A. E. NORTH & W. K. SHELDON.

MACHINE FOR CUTTING STONE.

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Fig. 7.

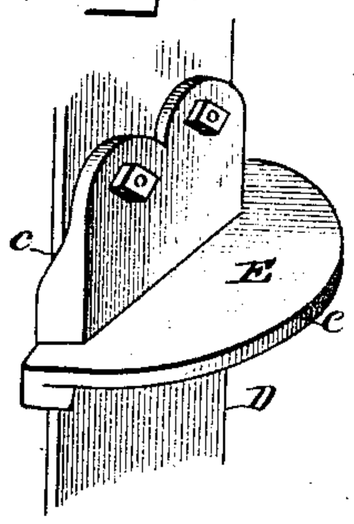


Fig. 8.

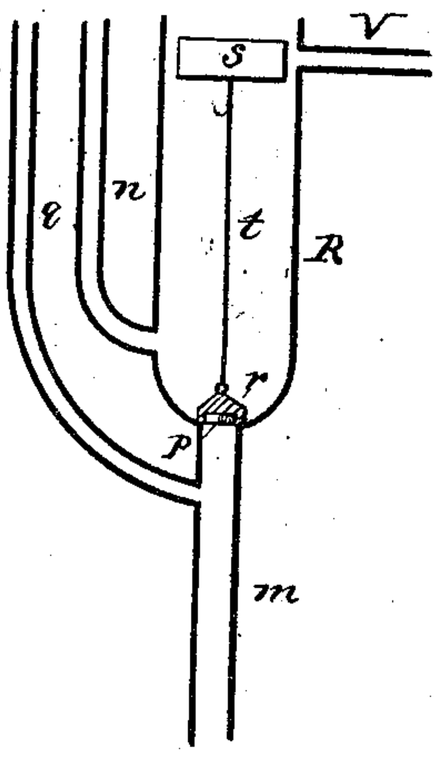


Fig. 9.

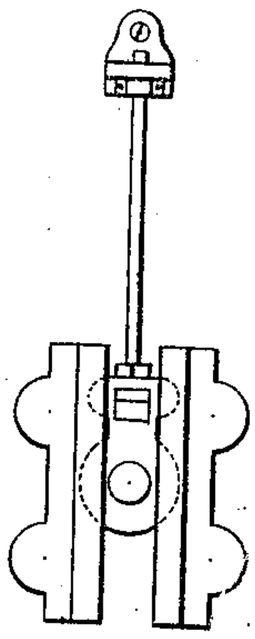
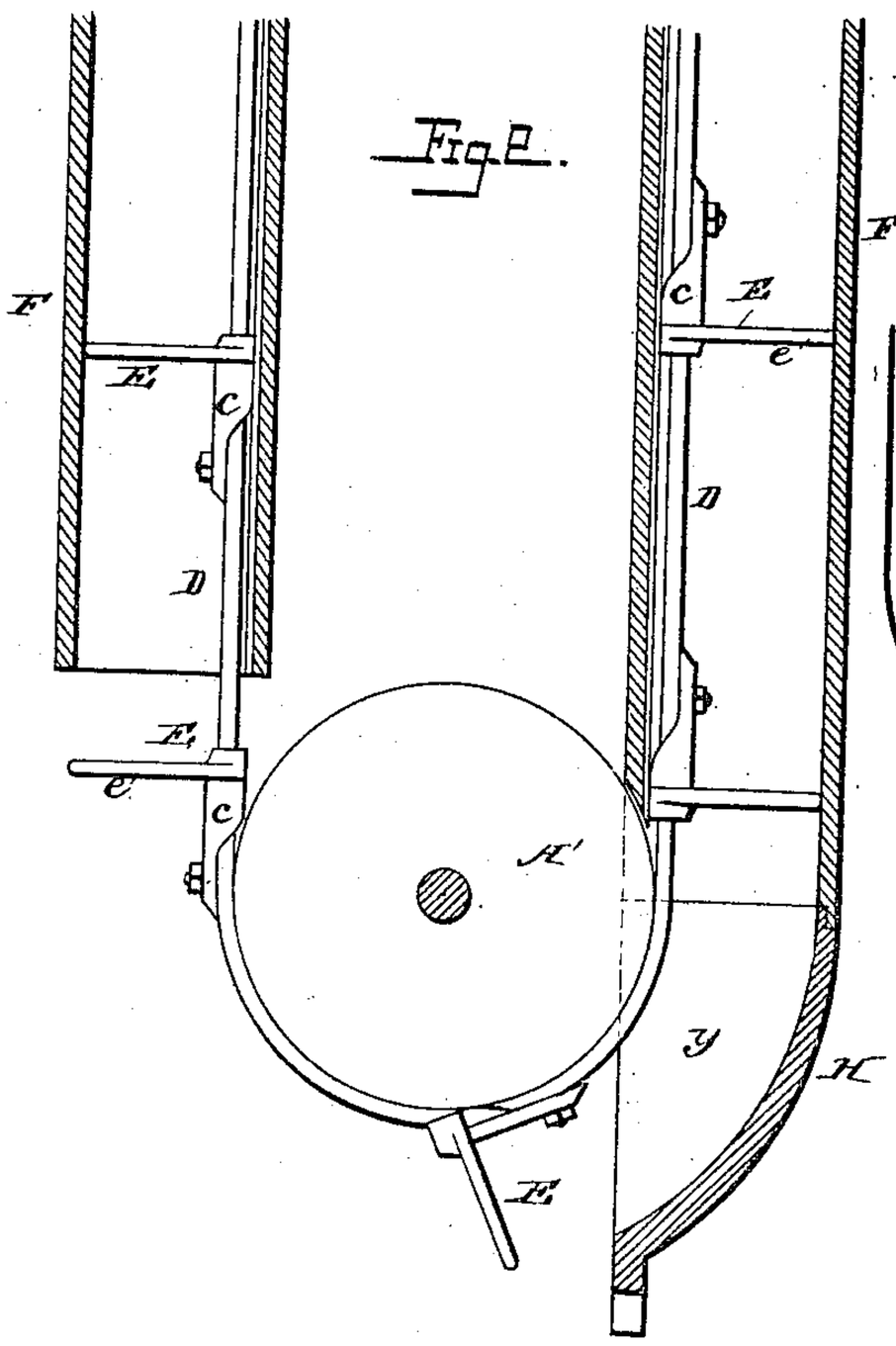


Fig. 8.



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UNITED STATES PATENT OFFICE.

AARON EUGENE NORTH AND WILLIAM KERR SHELDON, OF WEST RUTLAND, VERMONT.

MACHINE FOR CUTTING STONE.

SPECIFICATION forming part of Letters Patent No. 336,256, dated February 16, 1886.

Application filed October 28, 1885. Serial No. 181,187. (No model.)

To all whom it may concern:

Be it known that we, AARON EUGENE NORTH and WILLIAM KERR SHELDON, citizens of the United States, and residents of West Rutland, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Machines for Cutting Stone, of which the following is a specification.

Our invention relates to certain improvements in elevating and distributing apparatus especially adapted for use when a mixture of sand and water is to be used, as in stone-sawing machines; and our invention consists in constructing the elevator, as fully described hereinafter, so as to prevent rapid destruction from the abrading and wear of the parts, prevent the overflow of the mixture, and generally increase the efficiency of the machine.

In the drawings, Figure 1 is a perspective view of sufficient of a stone-sawing machine with parts broken away to illustrate our improvements. Fig. 2 is an enlarged vertical section showing the lower pulley, band, conductors, and elevating-tube. Fig. 3 is a perspective view showing the construction of the tube. Fig. 4 is a transverse section through the tube. Fig. 5 is a transverse section showing a modified form of tube. Fig. 6 is a face view of the lower part of the tube. Fig. 7 is a perspective view showing part of the band and one of the conductors. Fig. 8 is a sectional elevation of the regulator. Fig. 9 is a detached view of the band-tightening device.

In sawing stone by machinery it is common to throw sand and water upon the stones being sawed from time to time, in order that the same may flow into the kerfs and beneath the edges of the soft-metal saws. Ordinarily the sand and water are placed upon the stone by attendants; but efforts have been made to substitute mechanical appliances for manual labor, but heretofore the results have been to a considerable extent unsatisfactory. One cause of the unsatisfactory result has been the expense of the appliances used for raising the sand and water. The other objection has resulted from the destructive effect of the sand upon the elevating appliances, which, it has been found, will be cut and abraded so quickly that constant renewals and repairs are required, resulting in considerable expense and serious loss of time. In order to avoid these objections, we provide each machine or a series of machines with an elevating apparatus of the character which we will now describe.

A A′ are two band wheels or pulleys, one above the point to which the mixture of sand and water is to be elevated, and the other arranged within the well or tank C, within which said mixture is deposited, and around both pulleys passes an endless belt or band, D. We have found that the character of the belt or band is of the utmost importance, and that it is essential to use a strong flexible material of such close texture that it cannot be penetrated by the sand, inasmuch as wire cables, chains, &c., having parts between which the sand can pass, are soon cut away by the play of such parts upon each other and upon the intervening sand. We therefore have found in practice that leather, rawhide, or rubber belting can be most effectively employed.

To the band D are secured the blades, which we term "conveyers," by means of which the mixture is elevated; but instead of forming these conveyers in the shape of buckets or receptacles to hold the mixture, we make each conveyer E in the form of a flat blade, and cause it to travel through a tube, F, the top of which terminates in but below the top of a tank or receptacle, G, the lower end of the tube extending below the lower pulley, A′, into the tank C. By this means each conveyer enters the bottom of the tube F below a certain portion of the mixture, which is carried up with and above the conveyer, and flows over the upper end of the tube F into the tank G, while the conveyer passes away from the tank without lifting therefrom any of the mixture. As the contact of the band D with the sides of the tube, or with any stationary object, would result in its rapid cutting away and destruction, we maintain it at all times free from contact with the tube by providing it with projections *a*, which bear against the tube, or, preferably, against metallic ribs or rails *b b*, in such manner as to absolutely prevent the contact of the band with the tube; and we make the band narrower than the tube and extend the conveyers beyond the sides thereof, so as to pre-

vent the edges of the band from being brought in contact with the tube at any point. The projections *a* may be arranged upon the band; but we prefer to extend the conveyers so as to form such projections. Thus each conveyer may be of the form represented in Figs. 2, 4, and 7, with a flange, *c*, for bolting to the face of the band D, with a plate, *e*, at right angles to the flange *c*, adapted to fit the tube F, and with side lugs or cheeks, *i*, projecting beyond the edges and back of the rear side of the band and bearing upon the rails *b*. The conveyer thus formed may be cheaply cast, easily applied to the band, and removed when required, and effectually maintains the band in such position in the tube as to prevent its abrading or cutting away. The tube may be of any suitable form in cross-section, and may be constructed in any suitable manner and of different materials. We prefer the form and construction illustrated in Figs. 3 and 4, where the tube consists of a flat board, *g*, and a curved strip, *h*, of wood or metal, preferably the latter, clamped to the band; but the tube may be wholly of wood rectangular in cross-section, as shown in Fig. 5, or it may be cylindrical. The band, likewise, may be a continuous flat strip of rubber belting, as shown in Fig. 1, or two such strips arranged side by side, as shown in Fig. 4, or it may be one or two cords or ropes of suitable material—as leather, hide, or rubber goods—as shown in Fig. 5, the pulleys A A′ in such case being preferably grooved. A tube or shield, F′, is preferably employed to protect the conductors at the descending side of the elevator; but its use is not essential.

In order to properly guide the conductors into the end of the tube F and prevent them from striking and binding against the lower edge thereof, we use a guide-block, H, consisting of a block or shield formed to make a curved or concave guiding-throat, *y*, which the outer ends of the conductors first enter freely, and with which they coincide more closely as they approach the mouth of the tube, so that if the belt should have slipped to either side upon the pulley the contact of the edge of the conductor with the edge of the guiding-throat will cause the parts to assume their proper position. The mixture is conducted from the upper tank, G, through a pipe, J, and when one elevator is used to more than one set or gang of saws two pipes, J, are used, each of which directs the mixture to the stone below.

In order to prevent the overflow of the tank G, it is provided with an ordinary overflow-pipe, *m*, which extends through the bottom of the tank G downward to the bottom tank, C, and a return-pipe, L, extends from the concave bed M of the machine back to the tank C, so as to conduct to the latter any of the mixture which passes down to the bed from the stone. In the course of time the sand becomes dulled and finely ground, so that it will no longer exert an abrasive effect, and it becomes necessary to supply fresh sand and water occasionally to the tank C, thereby increasing the quantity of mixture. Ordinarily the surplus mixture containing the lighter and finely-ground particles of sand flows from the tank C through a discharge-pipe, N; but under some circumstances the tank C cannot be elevated to a sufficient extent to permit the overflow of the discharged mixture by gravity. We therefore provide for taking the overflow from a higher point than the tank C. This is effected by the use of a regulator, R, consisting of a tank or vessel, *n*, having at the bottom a port, *p*, communicating with the overflow-pipe *m*, a pipe, *q*, extending from the tank G nearly to the bottom of the vessel *n*, and conducting the mixture from the tank G to the said vessel *n*. A valve, *r*, normally closes the port *p*, the said valve being connected by a rod, *t*, to a float, *s*, the rod being of such length that when the valve *r* is on its seat the float *s* will be below the mouth of a discharge-pipe, V, leading from the vessel. Normally the valve *r* is closed; but when there is an excess of mixture in the tank G the float *s* will rise, and the heavier particles of sand which have accumulated in the vessel *n* will be discharged through the pipe *m* into the tank C, while the lighter particles which have become useless will flow with the upward current into the pipe V and will be discharged. It will be seen that the end of the tube N is at such a height that the mixture will flow into the same only when it rises to an unusual height, so that the regulator is brought into operation only when there is an overflow, and when it is desirable to separate the mud from the sand.

When the regulator is used, the overflow-pipe *m* may be dispensed with; but we prefer to use both, and to put the overflow-pipe a little higher than the pipe N, so as to take off any unusual excess and relieve the regulator.

It will be evident that the tube F may be constructed in different ways and of different materials, and that other features may be varied without departing from the principle of our invention.

Without limiting ourselves to the precise construction and arrangement of parts shown, we claim—

1. The combination, in an elevator, of the conveyers at one side of the band, tube, endless traveling band, and bearings arranged to prevent the contact of the band and tube, substantially as described.

2. The combination of the tube, conveyers, and band supporting the conveyers and consisting of a material practically impermeable to sand, substantially as described.

3. The combination of a flat band and conveyers attached to and projecting beyond the faces and edges of the same, substantially as described.

4. The combination of the elevator-tube, endless band, and conveyers adapted to the tube supported at one side of the band, and

constructed to prevent the contact of the band and tube, substantially as described.

5. An elevator consisting of a traveling band, pulleys supporting the same, lower and upper reservoirs, a tube extending between the reservoirs, conveyers adapted to the tube arranged upon the band, and bearings arranged to maintain the band free from contact with the tube, substantially as described.

6. The combination of the band and conveyers, each supported at one side of the band and provided with cheeks *i i*, projecting beyond the edges and back of the band, substantially as described.

7. The conveyers consisting of plates *e*, provided with flanges *c* and cheeks *i i*, substantially as described.

8. The combination of the traveling band, conveyers, and tube provided with rails or ribs, constituting bearings for projections on the band, substantially as described.

9. The tube consisting of a flat section, *g*, and curved or arched section *h*, and provided with rails *b b*, substantially as described.

10. The combination, with the traveling band, conveyers, and tube, of a guide block or shield, H, substantially as and for the purpose described.

11. The combination, with the elevated tank, of a regulator provided with a float-valve and two discharge-ports, the float and valve connected to open the lower and upper port when the supply in the tank is unduly increased, substantially as described.

12. The combination, with the tanks C G, pulleys A A′, endless band, conveyers, and tube, of adjustable bearings for one of the pulleys, substantially as described.

13. The combination of an elevated tank receiving the overflow and provided with an upper and a lower discharge-opening and with a valve closing the lower opening, and connected to be operated by a float, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

AARON EUGENE NORTH.
WILLIAM KERR SHELDON.

Witnesses:
JOSEPH H. EAYRS,
LORENZO P. HOLT.