No. 693,465. Patented Feb. 18, 1902.

L. TREADWELL.

MACHINE FOR DELIVERING COMMINUTED SOLIDS.

(Application filed May 28 1901.)

(No Model.) 2 Sheets—Sheet 1.

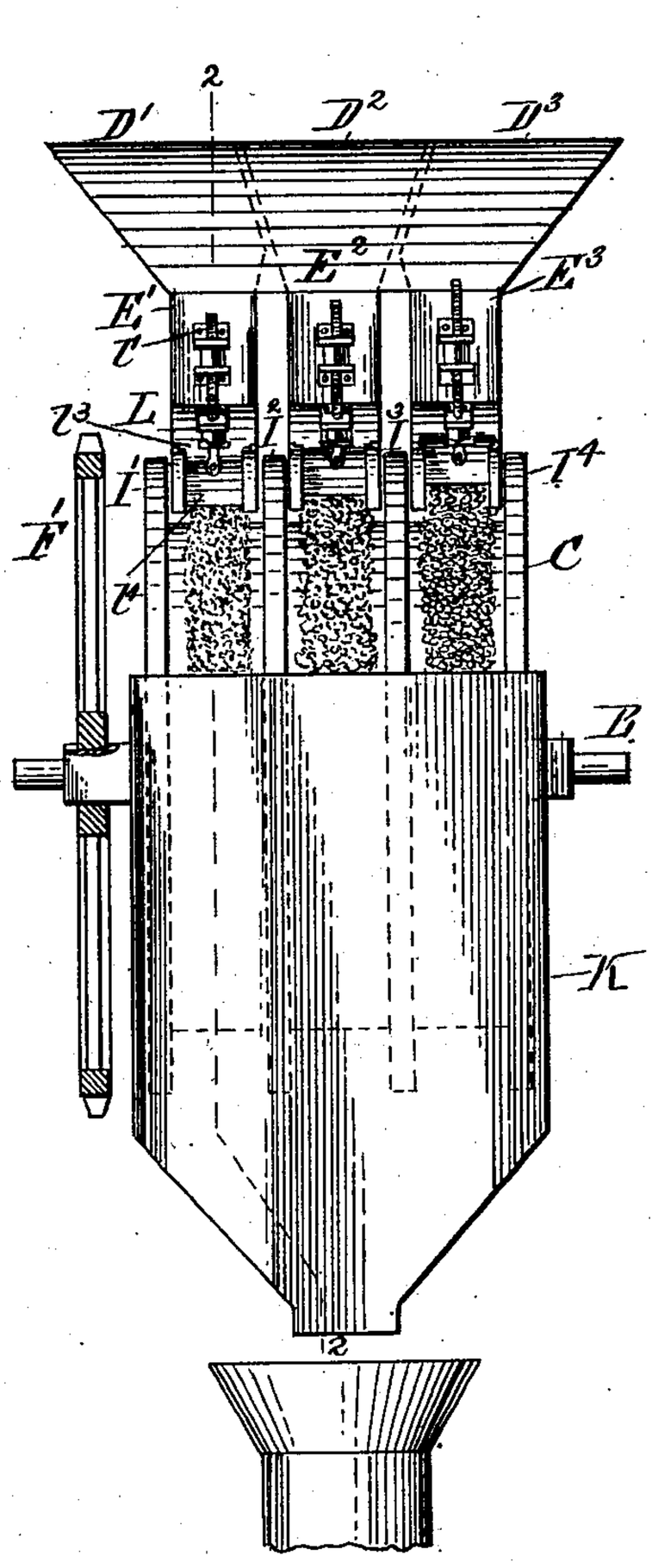

Fig. 1.

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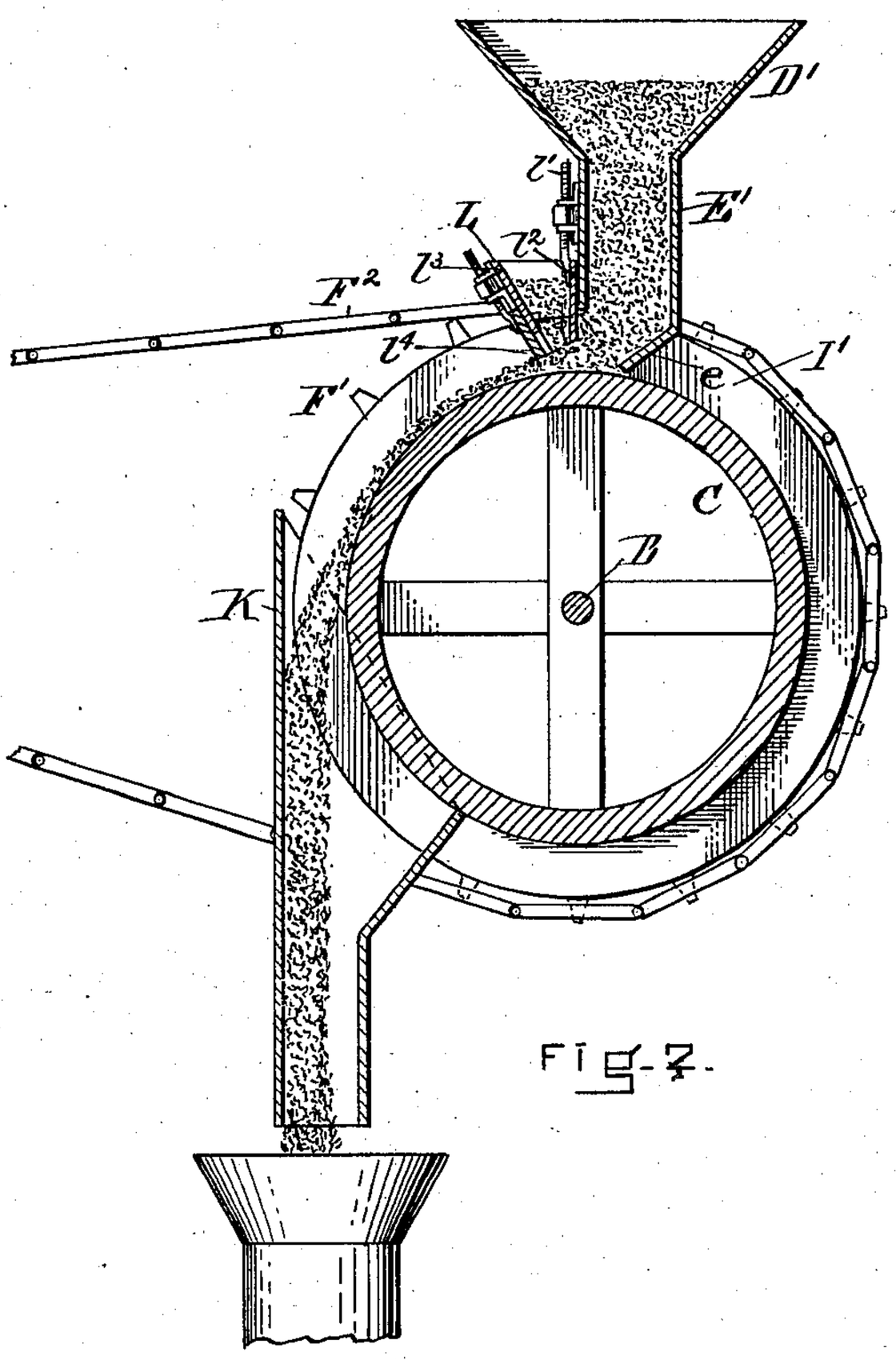

Fig-7.

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LEE TREADWELL, OF PORTSMOUTH, NEW HAMPSHIRE.

MACHINE FOR DELIVERING COMMINUTED SOLIDS.

SPECIFICATION forming part of Letters Patent No. 693,465, dated February 18, 1902.

Application filed May 28, 1901. Serial No. 62,256. (No model.)

To all whom it may concern:

Be it known that I, LEE TREADWELL, a citizen of the United States, residing at Portsmouth, in the county of Rockingham and State of New Hampshire, have invented new and useful Improvements in Machines for Delivering Comminuted Solids, of which the following is a specification.

My invention consists in improvements in machinery for conveying and delivering comminuted solids at substantially constant rate and in measured quantity, even when the comminuted mass is not homogeneous in quality, and is therefore subject to unexpected irregularities in the rate of flow.

To illustrate the operation of my invention and its utility in a characteristic situation, I will describe a machine for delivering the materials for concrete in measured proportions and in connection therewith will show the applicability of my invention to a machine for delivering cement in its usual finely-divided state.

In the drawings hereto annexed, Figure 1 is a front elevation of a delivering-machine suitable for handling the several ingredients of concrete. Fig. 2 is a vertical cross-section of the machine shown in Fig. 1 along the line 2 2, Fig. 1.

On any suitable framework (none is shown in the drawings) there is journaled a shaft B, upon which the cylinder-conveyer C is rotatively mounted. Above the conveyer C there are several bins D′ D² D³, which receive from above and deliver to the conveyer C below the several comminuted solids—as, for instance, cement, sand, and crushed stone. The bins D′ D² D³ are provided with chutes E′ E² E³, respectively, which present their discharge-orifices to the conveyer-cylinder C. The materials can be fed into the bins D′ D² D³ while the cylinder C is at rest, as the surface of the cylinder is placed near the discharge-orifices of the chutes E′ E² E³, so that the cylinder holds enough material flowing from the chutes to choke the flow at once.

The cylinder-conveyer C is provided with annular flanges I′ I² I³ I⁴, which serve to check side spreading of the solids flowing from the chutes. Side flow may be prevented by partitions or guards located at the sides of the chutes and secured either on the cylinder-conveyer or to some stationary part of the machine.

The conveyer C is moved by means of the sprocket and chain F′ F², the power being applied by another sprocket. (Not shown.) The operation of the machine is so far assisted by the flow of solids from the chutes that when once started a large machine can easily be kept in motion and be regulated by one man standing at the crank of the driving-sprocket. If desired, the bearings of the cylinder-shaft may be provided with antifriction-rollers and the surface of the conveyer be slightly roughened, so that when started the cylinder will be kept in motion by the flow of material acting like water on an overshot wheel. It is desirable, however, always to have the machine under control.

The even surface of the conveyer C is placed so near the chute-orifices that when the conveyer is in motion the surface thereof retards the normal flow of solids from the bins. By this means the rate of flow of solids from a bin, and consequently the number of cubic feet per minute delivered, is very nearly directly proportionate to the rate of motion of the conveyer-surface past the discharge-orifice, so that a given solid—as, for instance, sand of uniform fineness—will flow at an easily-regulated rate from a bin. As the character of the solids to be delivered varies, the size of the effective discharge-opening between the discharge-orifice and the conveyer-surface will have to be regulated in order to secure a desired rate of delivery with a given rate of motion of the conveyer-surface, and in case several different solids are to be delivered together in regulated proportions, as in the example here shown of a machine for delivering the ingredients of concrete, it is desirable to provide means for proportioning the rate of flow of the several ingredients and for regulating the delivery capacity of the several discharge-orifices accordingly.

The conveyer-cylinder C delivers its load to the common receptacle K, which consists of a funnel, which may lead to a concrete-mixing machine.

It has been observed that some materials are less free and uniform in their flow than others. While, for instance, sand and broken stone run readily from the bins and chutes,

such as are described above, cement is not so tractable, and I have invented an improvement in the discharging apparatus which may be used with good effect whenever material is to be handled which is subject to intermissions in movement through the chute.

Fig. 2 best illustrates my improvement. The bin D′ and conveyer C are of the form already described. At the side of the chute E′ there is hung the box L, which serves as a storage-chamber for the material flowing out of the chute E′. The box L is mounted on a screw-hanger l', so that the back wall l^2 serves as a gate for the chute E′. On the front wall l^3 of the box L there is mounted the sliding gate l^4. By arranging the gate l^4 so as to secure the desired rate of flow of the material to the conveyer as the latter moves in the direction indicated and by hanging the box L so that the opening between the back wall l^2 and the conveyer is larger than that provided by the gate l^4 the following result is reached: The comminuted solids flow from the bin D′ into the box L, when, by reason of the fact that the opening of the gate l^4 is more constricted than that of the back-wall gate l^2, the material piles up in the box L. Then if by reason of clogging in the chute E′ the material ceases momentarily to flow from the chute E′ at its usual rate the material stored in the box L falls into the gap and supplies the conveyer until the flow from the chute E′ is resumed.

In the construction herein shown the chutes E′ E^2 E^3 are made to deliver in the direction of movement of the conveyer. The bottoms of the chutes are inclined at *e*, Fig. 2, so that the conveyer always shifts material away from the back wall of the chute, and thus avoids any jamming of material which might otherwise take place.

What I claim, and desire to secure by Letters Patent, is—

1. In a machine for delivering comminuted solids, the combination of a bin, provided with a discharge-orifice, an even-surfaced conveyer movable with relation to the discharge-orifice and placed so near thereto that the surface of the conveyer when in motion retards the normal flow of solids from the bin, a storage-chamber at the side of the discharge-orifice, having a discharge-opening to the conveyer of less normal delivery capacity than the bin-orifice, the storage-chamber being so placed that the conveyer-surface passes under it after leaving the discharge-orifice of the bin.

2. In a machine for delivering comminuted solids, the combination of a bin, provided with a discharge-orifice, an even-surfaced conveyer, movable with relation to the discharge-orifice and placed so near thereto that the surface of the conveyer when in motion retards the normal flow of solids from the bin, a storage-chamber at the side of the discharge-orifice, having a discharge-opening to the conveyer, a gate for the discharge-opening of the storage-chamber whereby the relative delivery capacity of the bin to the conveyer and the storage-chamber to the conveyer may be regulated, the storage-chamber being so placed that the conveyer-surface passes under it after leaving the discharge-orifice of the bin.

3. In a machine for delivering comminuted solids, the combination of a bin, a discharge-chute therefor, a storage-chamber at the side of the discharge-chute, the latter provided with an opening into the storage-chamber, means for regulating the size of the said opening, an opening from the storage-chamber, means for regulating the size thereof, and an even-surfaced conveyer, movable with relation to the discharge-chute and storage-chamber, and placed so near to both that the surface of the conveyer when in motion retards the flow of solids from the discharge-chute and storage-chamber.

4. In a machine for delivering comminuted solids, the combination of a bin provided with a discharge-orifice, an even-surfaced conveyer movable with relation to the discharge-orifice and placed so near thereto that the surface of the conveyer when in motion retards the normal flow of solids from the bin, and a storage-chamber at the side of the discharge-orifice, provided with a discharge-opening to the conveyer, substantially as described.

5. In a machine for delivering comminuted solids, the combination of a bin provided with a discharge-orifice, an even-surfaced conveyer movable with relation to the discharge-orifice and placed so near thereto that the surface of the conveyer when in motion retards the normal flow of solids from the bin, and a vertically-adjustable storage-chamber at the side of the discharge-orifice, provided with a discharge-opening to the conveyer, substantially as described.

Signed by me at Boston, Massachusetts, this 23d day of May, 1901.

LEE TREADWELL.

Witnesses:
ÖDIN B. ROBERTS,
FRANK S. HARTNETT.