No. 756,600. PATENTED APR. 5, 1904.

J. M. DODGE.

BELT CONVEYER.

APPLICATION FILED NOV. 18, 1902.

NO MODEL.

Fig. 1.

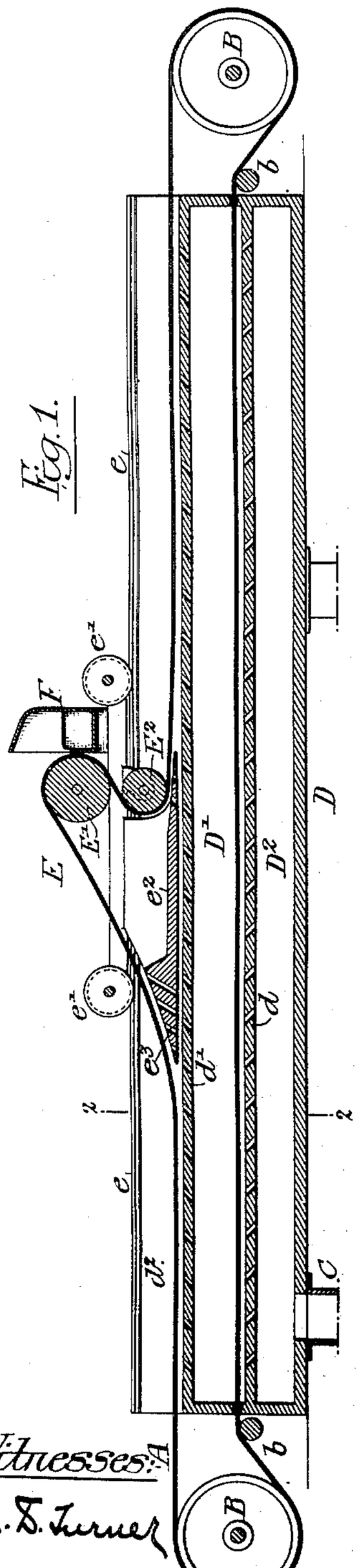


Fig. 2.

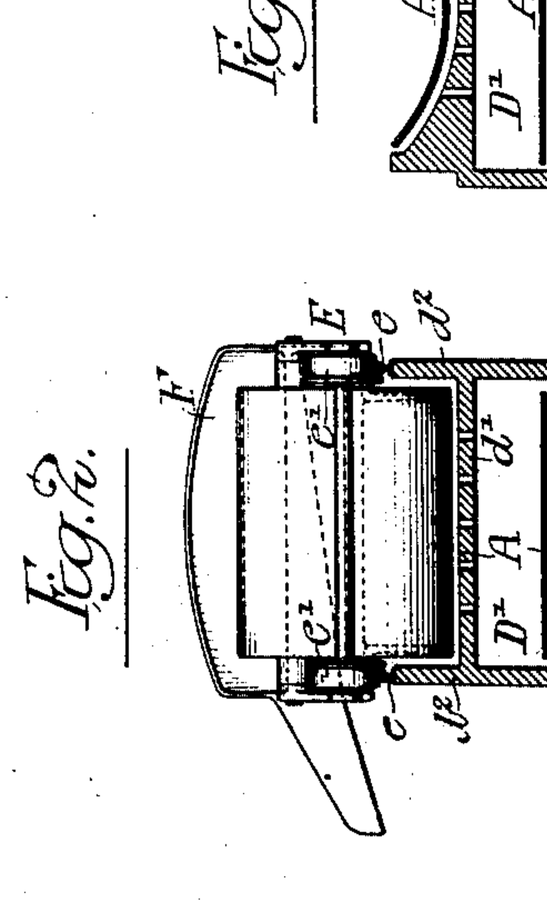


Fig. 3.

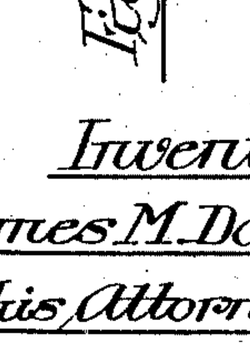


Fig. 4.

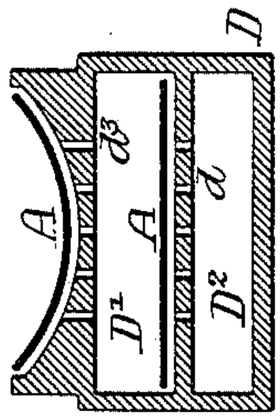


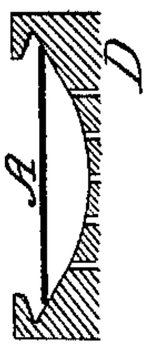
Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.



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No. 756,600. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

JAMES M. DODGE, OF PHILADELPHIA, PENNSYLVANIA.

BELT CONVEYER.

SPECIFICATION forming part of Letters Patent No. 756,600, dated April 5, 1904.

Application filed November 18, 1902. Serial No. 131,870. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. DODGE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Belt Conveyers, of which the following is a specification.

The object of my invention is to support a conveying-belt on an even bed with the least amount of friction, so that it will travel without jarring the material carried thereby, and thus a flat belt can be used, and a greater quantity of material can be conveyed than heretofore.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved conveyer. Fig. 2 is a transverse sectional view on the line 2 2, Fig. 1. Fig. 3 is a sectional view showing only one run of the belt carried by a film of air. Fig. 4 is a view showing the air-chamber having a concaved upper surface. Fig. 5 is a sectional view showing deflectors for the air escaping past the edges of the belt. Fig. 6 is a modification of the device shown in Fig. 5. Fig. 7 is a view showing the edges of the belt resting on inclined portions of the box. Fig. 8 is a sectional view showing the combination of the deflector with a box having the inclined portions upon which the edges of the belt rest, and Fig. 9 is a view showing the device illustrated in Fig. 8 in combination with the box having a concaved upper surface.

A is an endless belt, which passes around wheels B at each end of the conveyer and preferably over guide-wheels *b b*.

D is an air-box made in the present instance to accommodate both runs of the conveyer-belt.

D′ is one air-chamber, and D² is the other air-chamber. The air-chambers are separated by a perforated partition *d*, which is directly under the return run of the belt A. The upper partition *d′*, which is directly under the carrying run of the belt, is also perforated, as shown in Figs. 1 and 2.

The air-inlet pipes C communicate with any portion of the box D as desired. In Fig. 1 I have shown the inlet-pipe communicating with one end of the lower air-chamber D².

The perforations in the partitions *d d′* may be either slots or holes of any form and may be inclined, as shown in Fig. 1, so that the air will act not only as a support or lubricant, but also as a driving means, as the blasts of air will impinge upon the under side of the belt and cause it to move forward. The openings may be graduated in long conveyers, and the air-box may be made in sections by placing vertical partitions therein, if desired. When the perforations are not inclined, then the belt must be driven from some outside means. Either one of the wheels B may be the driving-wheel of the apparatus, and in some instances the driving may be done through one of these wheels, as well as by the air-blast.

In order to discharge the material at any point on the carrying run of the belt, I provide a traveling discharger E, which has wheels *e′*, mounted on rails *e e*, in the present instance on the upper edges of the sides *d²* of the box D, and this discharger has two drums E′ E² one above the other and around which the carrying run of the belt passes, as shown in Fig. 1. Directly in front of the upper roll is a hooded chute F in the present instance to receive the material as it is discharged from the belt.

Carried by the discharger E is a cover-plate *e²*, which rests close to the perforated partition *d′* and closes the openings between the point that the belt leaves the partition and the point it returns to the partitions. In some instances the upper portion of the cover-plate may conform to the line of the belt for a certain distance, and passages *e³* may be formed therein, as in Fig. 1, to admit air under the belt at this point.

It will be noticed in referring to Fig. 2 of the drawings that there is clearance between each edge of the belt and the sides of the air-box D, so as to allow for the escape of a certain proportion of air from underneath the belt.

In Fig. 5 I have shown deflectors *g g* on the sides of the box D directly above the clearance-passages, so as to deflect the air toward the load carried by the belt, and thus the escaping air tends to keep the small particles of material (if granular material is being carried) away from the edges of the belt.

In Fig. 6 I have shown deflectors *g′*, turned

downward over the edges of the belt, and exhaust-openings d^2 in the sides of the box D to allow for the escape of air when it is not wished to have the air escape near the material being conveyed.

In Fig. 3 I have shown a single air-box D^3 for the carrying run only of the belt A, the return run of the belt being hung or supported at intervals in the ordinary manner.

In Fig. 4 I have illustrated a belt curved laterally on the carrying run, the belt conforming to the curve of the partition-plate d^3. The return run of the belt is flat, as shown.

In some instances the partition-plate may be slightly beveled at each edge, as in Fig. 7, so that the belt will have a neat fit against the beveled edge, but will allow air under pressure to escape.

The operation of the conveyer is as follows: Air is admitted to the box D at the pressure desired, and the conveyer-belt is driven either by the air or driving-wheels, or both. The air passing through the perforations in the partitions d' and d will support the belt without the use of rollers or other supports. The load will not be disturbed in its travel, as the belt will be carried evenly over the body of air. The air will escape at the sides of the belt in the proper proportion to allow for the correct buoying of the belt with or without its load, and by moving the discharging device E the load can be discharged at any point desired.

I claim as my invention—

1. The combination of an endless conveying-belt, and means for supplying a film of air to support said belt, substantially as described.

2. The combination of a conveying-belt, an air-box under the belt and communicating with the under side of the belt, so that a film of air will support the belt in its travel, substantially as described.

3. The combination of an endless carrying-belt having a carrying and return run, and an air-box under each run of the belt and perforated, substantially as described.

4. The combination of an endless conveying-belt, a box having two air-chambers separated by a perforated partition, and a perforated partition covering the upper chamber, one run of the belt being above the upper chamber and the other run within the upper chamber directly above the perforated partition, substantially as described.

5. The combination of an endless conveying-belt, an air-box under the belt and communicating with the under side thereof, so that a film of air will support the belt in its travel, the belt being narrower than the box to form clearance-passages, substantially as described.

6. The combination of a conveyer-belt, an air-box under the belt communicating with the under side thereof, so that a film of air will support the belt in its travel, the belt being narrower than the box so as to form clearance-passages therefor, and deflectors above the clearance-passages, substantially as described.

7. The combination of a conveyer-belt, an air-box under the belt communicating with the under side thereof, so as to support the belt in its travel, the belt being narrower than the box so as to form clearance-passages therefor, and deflectors above the clearance-passages, said deflectors being arranged at an angle so as to direct the air over the upper surface of the belt, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES M. DODGE.

Witnesses:
WILL. A. BARR,
JOS. H. KLEIN.