J. M. DODGE.

CONVEYER.

APPLICATION FILED JAN. 2, 1907.

973,921.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

Fig. 2.

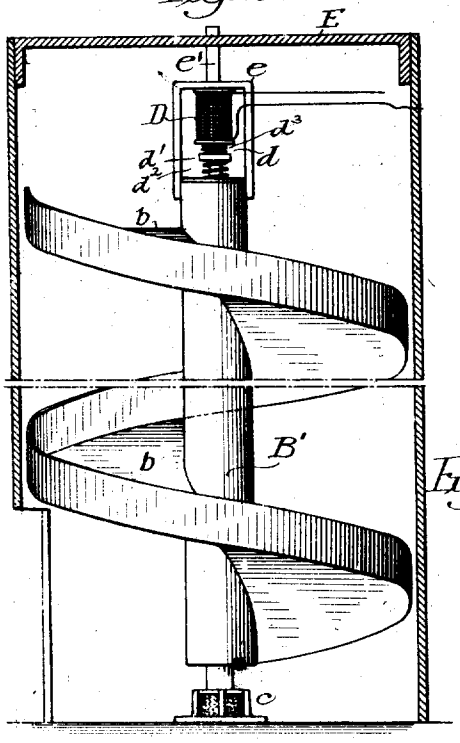


Fig. 1.

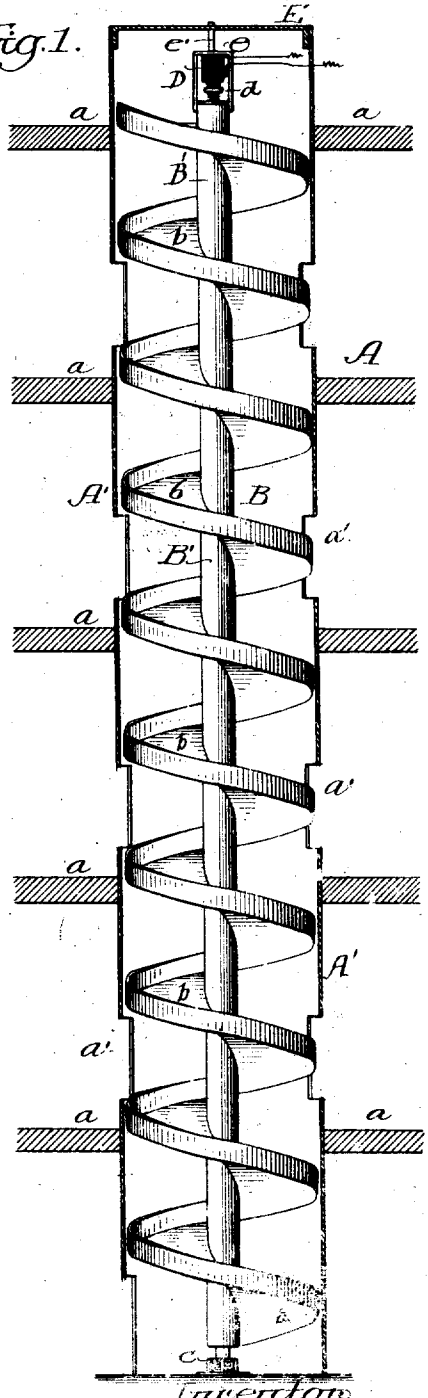
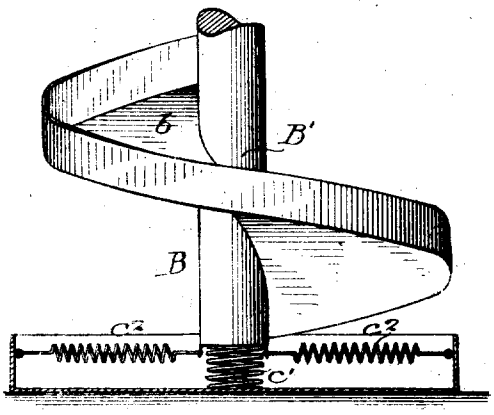


Fig. 3.

Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

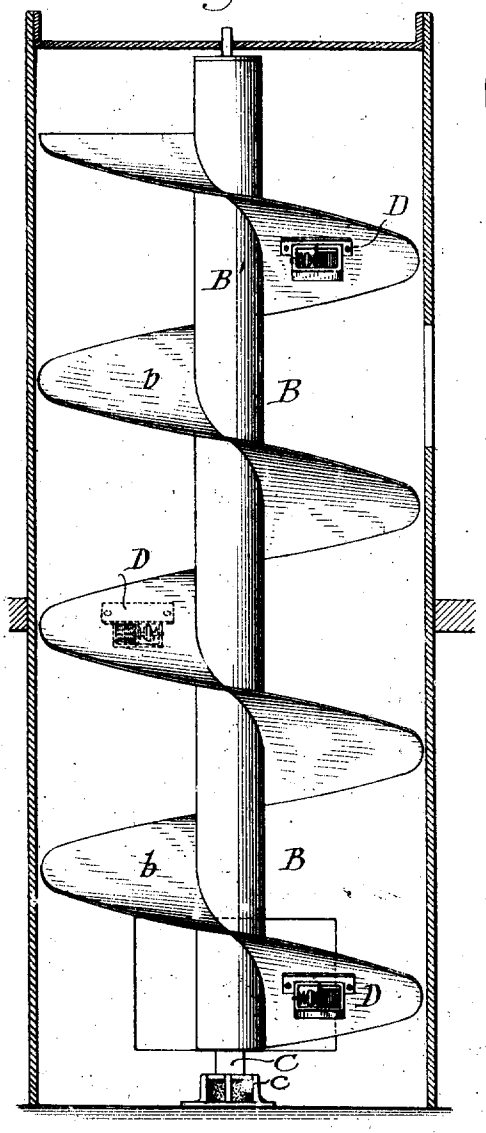


Fig. 6.

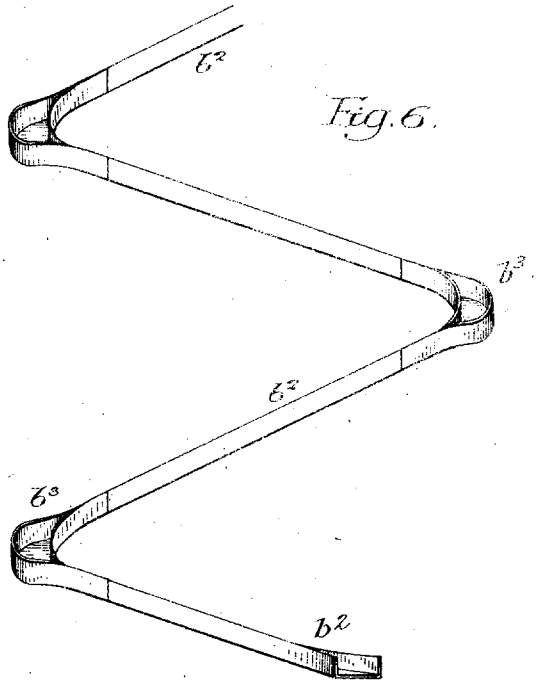


Fig. 8.

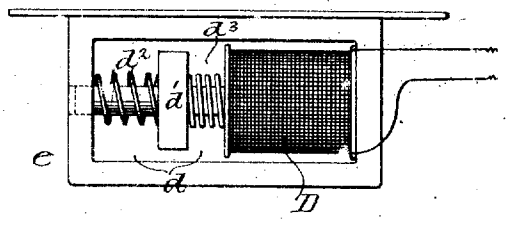
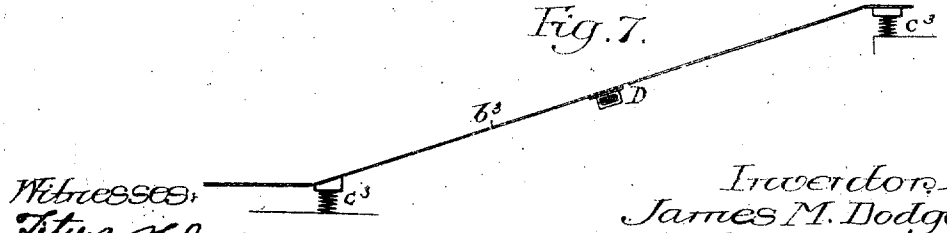


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES M. DODGE, OF PHILADELPHIA, PENNSYLVANIA.

CONVEYER.

973,921. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed January 2, 1907. Serial No. 350,368.

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 Conveyers, of which the following is a specification.

My invention relates to certain improvements in inclined planes for lowering boxes and packages, or other material, from a height to a delivery point.

My invention is particularly adapted for use in stores or warehouses where packages must be transferred from the upper floors to the shipping floor.

The object of my invention is to so construct an apparatus of the inclined plane type for lowering material that packages differing in weight and bulk may be lowered at or about the same rate of speed.

By my invention I find that I can transfer materials of different weights and different kinds from an upper floor to a lower floor at about the same rate of speed. This I accomplish in the following manner, reference being had to the accompanying drawings, in which:—

Figure 1; is a vertical sectional view through the different floors of a building, illustrating one form of my invention; Fig. 2, is an enlarged sectional view of the upper end of the device illustrated in Fig. 1; Fig. 3, is an enlarged view of the lower end of the device illustrated in Fig. 1; Figs. 4, 5, 6, 7 and 8, are views of modifications of the invention.

In this instance A is a building and *a* the different floors of the building. Extending through the building is a well A′ in which is the inclined plane B in the form of a spiral. The floor *b* of the inclined plane is secured in any suitable manner to the central standard B′. As illustrated in Fig. 3, the base of this standard rests in an elastic cushion *c* supported on the foundation of the structure; this elastic cushion may be either made of rubber or in the form of a metallic spring. The inclination of the floor *b* of the spiral inclined plane is at an angle less than the angle of slide of the material to be transferred from the upper floors to the lower floor, so that when the inclined plane B is at rest the material will not slide, and in order to make the material slide I provide means for imparting a tremor to the inclined plane and this tremor will give sufficient motion to the material mounted on the inclined plane as to cause it to move and, consequently, the movement will be downward owing to the inclination of the floor of the plane.

In sundry experiments I have found that materials of different weight will travel on this improved apparatus at about the same speed. It will be understood that after the package is placed on the inclined plane to be delivered at the lower end it is not necessary that it should travel downward at a great speed; in fact considerable time can elapse between the delivery and discharge without interfering with the routine business of the store, as it will be understood that as soon as the package moves from the receiving end of the apparatus another package can be placed in position, and so on; as in most instances these devices are used for transporting material for wagon delivery, but breakage must be avoided and a light package must not be crushed or injured by a heavy package. By my invention the speed of travel is such that the heavy package cannot maintain such a speed that the contents would be liable to break should the package come to a sudden stop, nor would it crush into a smaller package and injure the contents, but the two packages would travel slowly down to the point of discharge.

There are several means for imparting a tremor to the inclined plane and any suitable vibrator may be used for this purpose; such a device is shown, for instance, in Figs. 1 and 2, and may be mounted on the upper end of the standard B′ of the inclined plane B. The device consists of a solenoid D carrying a yoke *e* mounted on the end of the standard B′, and on the yoke is a pin *e′* mounted in a bracket E; the pin may be cushioned in a bracket in any suitable manner. An armature *d* is mounted in the solenoid and has a disk *d′*, and there are springs d^2, d^3, one on each side of the disk, and one spring is heavier than the other, as shown in Fig. 8. The cushions at the upper and lower ends of the inclined plane are for the purpose of preventing the tremor action being imparted to the building. Wires lead to the source of a low frequency alternating current so that when the current is switched into the solenoid the action of the solenoid will cause the entire spiral structure to tremble, so that any article placed on the structure will slowly slide down the inclined

plane to the point of discharge. Suitable openings a' may be provided at each floor for the placing of articles of merchandise on the inclined plane, and there is an opening at the base for the free discharge of the merchandise.

In Fig. 4, I have shown a spring cushion c' in place of the rubber block illustrated in Fig 3, and in this view I have shown side springs c^2 for taking up the shock.

In Fig. 5, I have illustrated a series of vibrators D' placed at intervals under the floor of the spiral inclined plane, and these vibrators can be constructed in any suitable manner and connected to any means for imparting a slight tremor to the structure. These vibrators may be in the form of a solenoid as in Fig. 8, or may be in the form of a motor having an arm on the armature out of balance so as to give a trembling action to the inclined plane.

In Fig. 6, I have shown a modification in which there are straight inclined planes b^2 connected to curved planes b^3. In this instance the trembling motion is only imparted to the curved planes and the angle of these planes is less than the sliding angle for the material, while the straight planes b^2 are at the angle of slide of the material so that while the material is free to slide on the straight planes it will be retarded on the curved planes and this retarding action will prevent the too rapid descent of the material from a high elevation to the point of discharge.

Other means for imparting this tremor may be resorted to without departing from the essential features of my invention, and the inclined plane may be made in other forms than that of a spiral. In fact, in some instances it may be in a straight line as in Fig. 7, placed at such an angle that the material will not move unless a tremor is imparted to the plane. In this figure the solenoid D is attached to the underside of the plane b^3 which is mounted on cushions c^3 c^3 at each end.

I claim:—

1. The combination of an inclined plane for transporting materials, said inclined plane being arranged to allow bodies of different weight and size to pass over the carrying surface, the plane being arranged at a less angle than the angle of slide of said material, and means carried wholly by the inclined plane for imparting a slight tremor to the said inclined plane so as to cause material to move slowly in the direction of the least resistance.

2. The combination of an inclined plane, a casing in which the inclined plane is situated, means carried by the inclined plane for imparting a tremor thereto, and an elastic support between the inclined plane and the casing.

3. The combination of a building, a spirally arranged inclined plane, the floor of the inclined plane being at an angle less than the angle of slide of the material to be transported, with a vibrator mounted on the underside of the inclined plane for imparting a tremor thereto.

4. The combination of an inclined plane for transporting materials, arranged in a spiral, the carrying surface of the inclined plane being arranged at an angle less than the angle of slide of the material to be transported, and a series of electrical devices located on the underside of the inclined plane for imparting a tremor thereto.

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

JAMES M. DODGE.

Witnesses:
Jos. H. Klein,
Wm. A. Barr.