(No Model.) 2 Sheets—Sheet 1.

J. H. & H. W. LAKIN.

PROPELLING DEVICE FOR CASH CARRIERS.

No. 418,196. Patented Dec. 31, 1889.

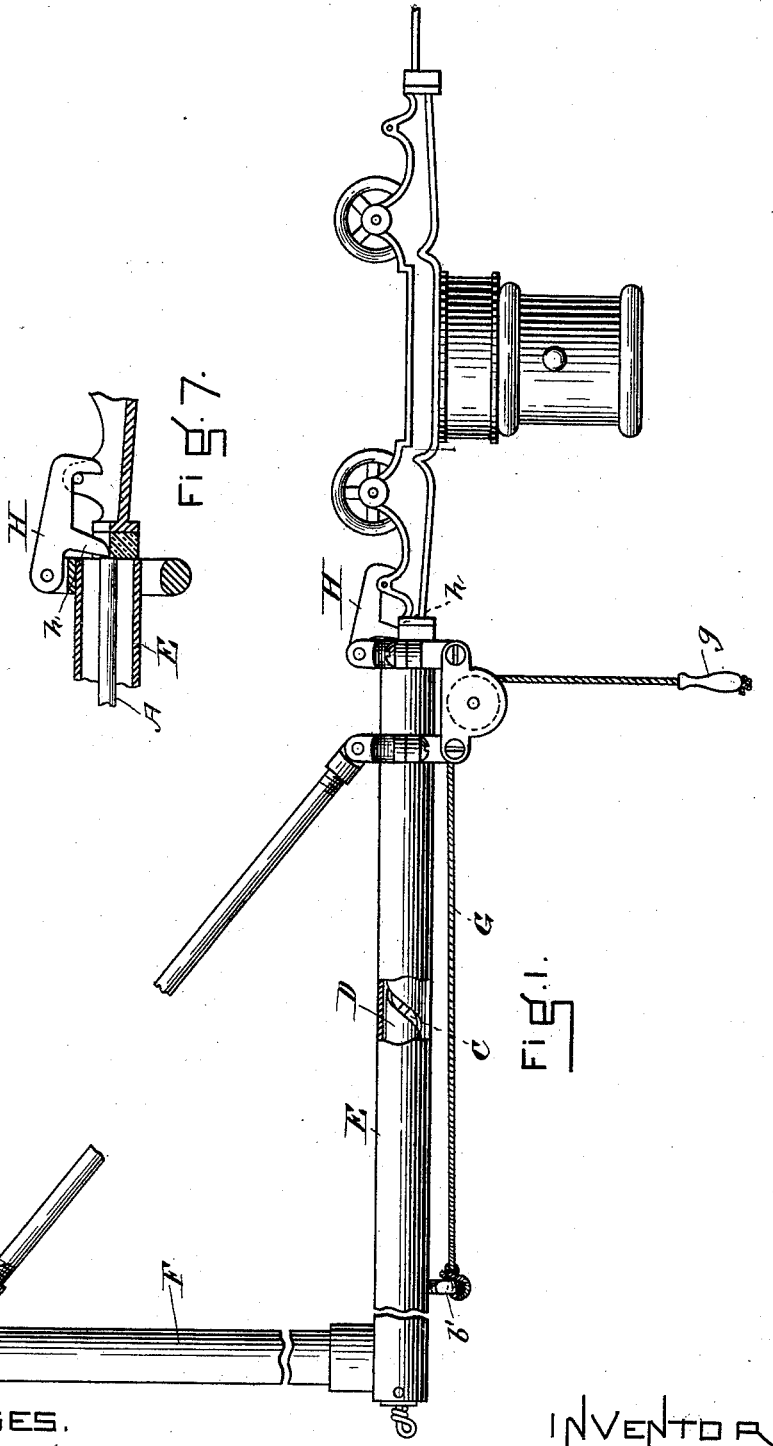

Fig. 7.

Fig. 1.

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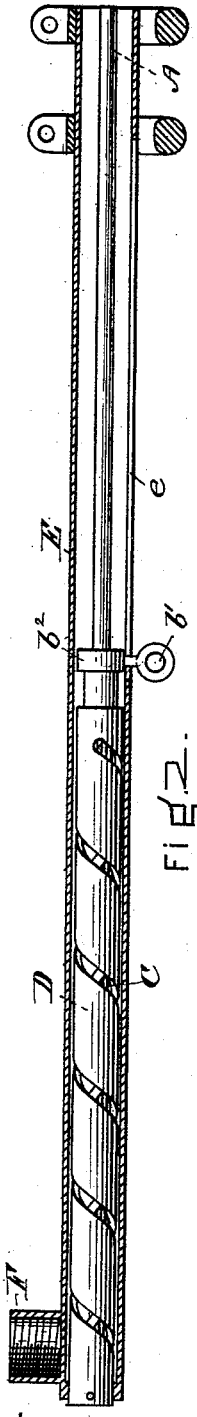

Fig. 2.

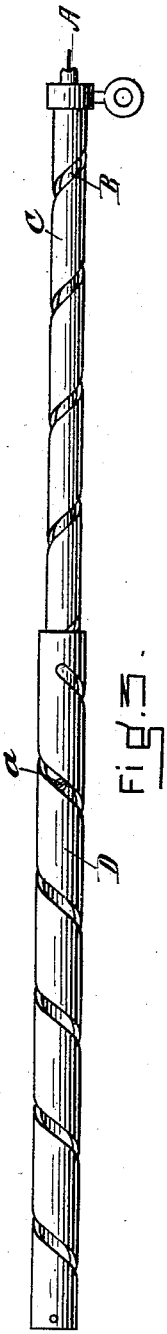

Fig. 3.

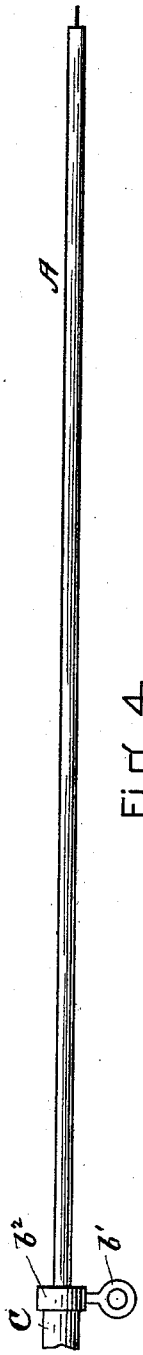

Fig. 4.

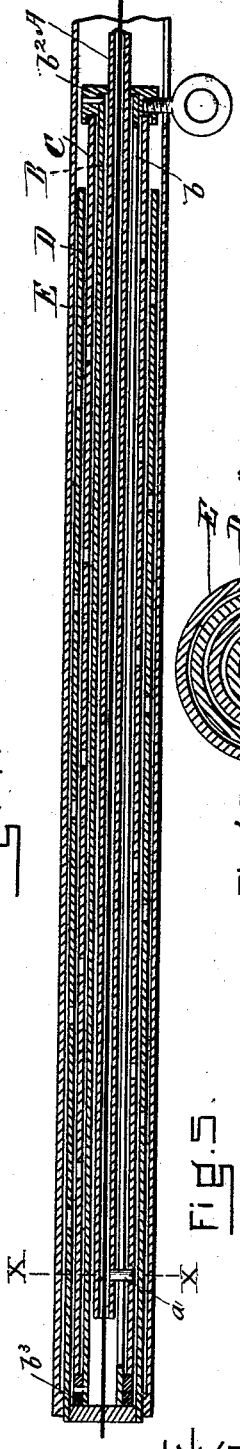

Fig. 5.

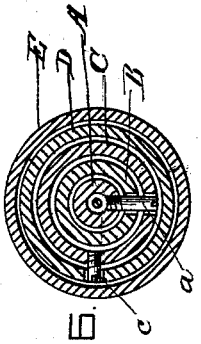

Fig. 6.

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PROPELLING DEVICE FOR CASH-CARRIERS.

SPECIFICATION forming part of Letters Patent No. 418,196, dated December 31, 1889.

Application filed April 5, 1889. Serial No. 306,104. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. LAKIN, of Boston, in the county of Suffolk and State of Massachusetts, and HARRY W. LAKIN, of Quincy, in the county of Norfolk, in said State, citizens of the United States, have invented certain new and useful Improvements in Propulsion Devices for Cash-Carriers, of which the following is a specification.

Our invention is designed to be used in connection with that class of cash-railways or store-service apparatus in which a wheeled carrier is caused to travel over a fixed way by an initial impulse given to it at one end thereof, and relates to improvements in the mechanism by which the hand of the operator is enabled to give to the carrier the impulse referred to.

In the accompanying drawings we have shown at Figure 1, in vertical elevation, a device embodying our present improvement as set up and ready for use in connection with a carrier to be impelled thereby. The form of carrier is a well-known one heretofore used for store-service apparatus. At Fig. 2 we have shown a vertical longitudinal section of the outer shell, with the other parts shown in side view in place therein, these parts being represented with the propelling-rod in its inner position. At Fig. 3 we have similarly represented these parts with the rod in its outer position, the outer shell and connected portions being omitted. Fig. 4 is a detail of the rod and the operating-stud. Fig. 5 is an enlarged vertical section of the propelling devices with the rod in its inner position, and Fig. 6 is a vertical cross-section thereof on the line x x of Fig. 5. Fig. 7 is a detail of an improved catch, which will be hereinafter explained.

In the drawings, A represents the propulsion-rod, having a pin a (best shown in Figs. 3, 5, and 6) at its rear or inner end. Surrounding this rod A is a shell B. (Best shown in Figs. 5 and 6.) This shell is provided at its lower part with a straight longitudinal slot b, (see Fig. 5,) which slot extends substantially throughout the length of the shell. At the outer extremity of the shell is attached a stud b', the shell being provided with an enlargement or shoulder b^2, to which the stud b' may be conveniently attached, and a similar shoulder b^3 may be formed on the inner end of the shell B, for a purpose hereinafter explained. The shoulder b^2 will preferably be made to surround the propelling-rod A with an easy fit, so that in the operation of the machine the rod can easily move past it.

Surrounding the shell B is a spirally-slotted shell C. (Well shown at Fig. 3.) This shell C is substantially equal in length to the shell B, which it surrounds and around which it is free to revolve, but with which it travels, its ends being inclosed for this purpose between the shoulders b^2 b^3. The pin a of the rod A, after passing through the straight slot in the shell B, enters the spiral slot in the shell C. (See Figs. 5 and 6.)

Upon the shell C is a pin c, (see Fig. 6,) which enters the slot of another spirally-slotted shell D. (Well shown in Fig. 3.) The spiral groove of this shell D is reversed from that of the shell C. Finally, around the shell D is the outer shell or casing E of the apparatus, which has a slot e in its lower part, (see Fig. 2,) through which the stud b' projects.

In the form of apparatus shown in the drawings the rod A is capable of outward and inward motion, sliding past the shell B, as before stated. The shell B is also capable of inward and outward motion, and is caused so to move by power applied from the hand of the operator to the stud b'. The shell C is likewise capable of inward and outward motion upon and with the shell B, which it surrounds; but the shell D is fixed to the outer shell E, which is itself fixed, as represented, to the supporting-standard F.

The rod A is prevented from rotation by reason of the pin a passing through the straight slot in the shell B, which shell itself is prevented from rotation by reason of its pin or stud b' passing through the slot e in the non-rotating shell E. The shell C is free to rotate around the shell B, while the shells D and E are fixed both against rotation and inward and outward movement by reason of their attachment to the standard, as stated.

As a convenient means of transmitting power from the hand of the operator to the

stud b', we prefer to employ a cord G, passing over a pulley and having its pendent end provided with a suitable pull g, as shown.

The operation of the device is as follows: When the stud b' is moved outwardly by the operator, it carries outwardly with it the shell B, to which it is attached, and consequently carries out the rod A. The outward motion of this shell B also carries outwardly the spirally-grooved shell C. As this shell moves outwardly its pin c is forced against the wall of the spiral slot in the fixed shell D, and thus the shell C is made to revolve while it moves forward. As it revolves the wall of its spiral groove is pressed against the pin a of the rod A, and as this rod cannot turn it thus receives an additional forward movement under the wedge action of the revolving slot. It follows, therefore, that for the motion of the stud b' from one end to the other of its path the rod A has a range equal to the length of the path of the stud b' plus the distance in a straight line from end to end of the spiral slot in the shell D. If, for example, the stud b' have a motion given by the hand of the operator of nine inches, and the slot in the shell D a net length of nine inches, the revolution of the shell C will also move the rod nine inches, and the rod will have a total outward travel of eighteen inches. We have found, however, in practice that these dimensions may be very materially lessened, and at the same time sufficient impulse be given to the rod to propel the carrier with sufficient rapidity to any distance likely to occur in practice.

We believe that it will be obvious to any person familiar with the principles involved in the operation of the apparatus that if the shell B were fixed against outward movement and the shell D made capable of rearward and forward movement, and the power of the operator were applied to the shell D to move it rearwardly, so much of the movement of the propulsion-rod would be obtained as was due to the revolution of the shell C, because the movement of the shell D would revolve the shell C through a distance equal to the net length of the slot in the shell D, and this motion of the shell C would produce that much forward movement of the rod A, precisely as it did in the other construction; but the forward movement formerly obtained by the carrying forward of the shell B would, of course, be lost, the shell being now supposed to be fixed and not capable of forward movement. If modified, as suggested, the device would, in other words, be operative, but to a less extent and of less practical value.

The propulsion-rod A may be made hollow, so that the wire ordinarily used for the way may pass through the center of the propulsion-rod. This construction is indicated in Fig. 5 by the black central line indicating the wire.

We have heretofore described the operation of the device in propelling the car. It is obvious that when the act of propulsion is completed the propelling-rod will be left in its farthest outward position. If now the car be returned from the distant end of the way, either by a duplication of the propelling device or by other suitable means, experience has shown that the ordinary frictional resistance of the parts of our improved propelling apparatus, while forming a very efficient buffer to stop the incoming car without shock, will at the same time be sufficiently slight to be readily overcome by its momentum, so that the car itself will bring back the propelling-rod to its innermost position and in readiness to be operated again. We have, furthermore, devised a catch adapted to be conveniently operated by the outward and inward movement of the propelling-rod to release and hold the car, respectively. This catch (shown at H, Fig. 1 of the drawings) is also represented more in detail at Fig. 7. This catch comprises a hook H, pivotally attached to the front portion of the outer shell E. It is provided, as shown, with a notched part to engage with a convenient adjacent part of the carrier, and also with a projecting lug h, which when the propulsion-rod is at its innermost position will be in front of and slightly within the limit of its path of motion, as represented in Fig. 7. If now the propelling-rod be advanced to start the carrier, the first effect of its outward motion will be to press against the lug h and move the catch to release the carrier, which is at once impelled forward upon the track by the outward thrust of the propulsion-rod A.

It will be observed that as represented in the drawings, and especially in section, a considerable amount of play is left between the various concentric shells of the device. In practice, however, no greater space is found necessary than will allow for their ready revolution or passage by one another without excessive friction.

We claim—

1. In a propulsion device for cash-carriers, the combination of a propulsion-rod, a sliding shell surrounding the rod and adapted to be moved outwardly by power applied from without, an inner spirally-slotted shell surrounding and adapted to rotate upon the first-named shell, an outer spirally-slotted shell surrounding the inner one, this outer shell being fixed and non-advancing and having its spiral reversed, a pin upon the inner spirally-slotted shell entering the spiral slot in the outer, a pin extending from the movable rod to and entering the slot of the inner spirally-slotted shell, and means, substantially as described, for preventing the rotation of the rod under the thrust of the slot of the inner spirally-slotted shell upon the pin of said rod, whereby it is caused to advance, all substantially as set forth.

2. In a propulsion device for cash-carriers, the combination of a propulsion-rod, a sliding shell surrounding the same and provided with a straight longitudinal slot, a revoluble

shell surrounding the first and provided with a spiral slot, a pin extending from the said rod through the straight slot in the first-named shell and entering the spiral slot in the second, a third shell surrounding the second and having a reverse spiral slot, a pin extending from the second shell into the spiral slot of the third, an outer supporting shell or case having a straight longitudinal slot therein, and a stud extending from the shell surrounding the rod outwardly through the slot in said outer shell.

3. In a store-service apparatus, the combination of a fixed way, a wheeled carrier adapted to be propelled thereon, a propulsion-rod to propel the carrier, a shell surrounding this rod, a second spirally-slotted shell surrounding the first shell and rotatable thereon, a pin extending from the propulsion-rod and entering the slot of the rotatable shell, and means for rotating the shell and forcing the wall of its slot against the pin to force the rod against the wheeled carrier, and thereby propel it over the way, substantially as set forth.

4. In combination, a propulsion-rod A, provided with a pin *a*, a shell B, provided with shoulders b^2 b^3, and also with a straight slot *b*, a surrounding shell C, adapted to rotate upon the shell B between the shoulders and provided with a spiral slot, a shell D, surrounding the shell C and provided with a reverse spiral slot, and a pin *c*, extending from the shell C into the slot of the shell D, all substantially as set forth.

5. In combination, a propulsion-rod A, provided with a pin *a*, a shell B, provided with shoulders b^2 b^3 and having a straight slot *b* therein, a surrounding spirally-slotted shell C, adapted to rotate upon the shell B between the shoulders, a shell D, surrounding the shell C and provided with a reverse spiral slot, a pin *c*, extending from the shell C into the slot of the shell D, an outer supporting-case E, to which the said shell D is secured, this case being provided with a slot *e*, and a stud *b'*, attached to the shell B and projecting outwardly through the slot *e*.

In testimony whereof we have hereunto subscribed our names this 3d day of April, A. D. 1889.

JOHN H. LAKIN.
HARRY W. LAKIN.

Witnesses:
ELLEN B. TOMLINSON,
JOHN H. TAYLOR.