

J. B. MONETTE.
BELT CONVEYER SYSTEM.
APPLICATION FILED FEB. 17, 1908.

2 SHEETS—SHEET 1.

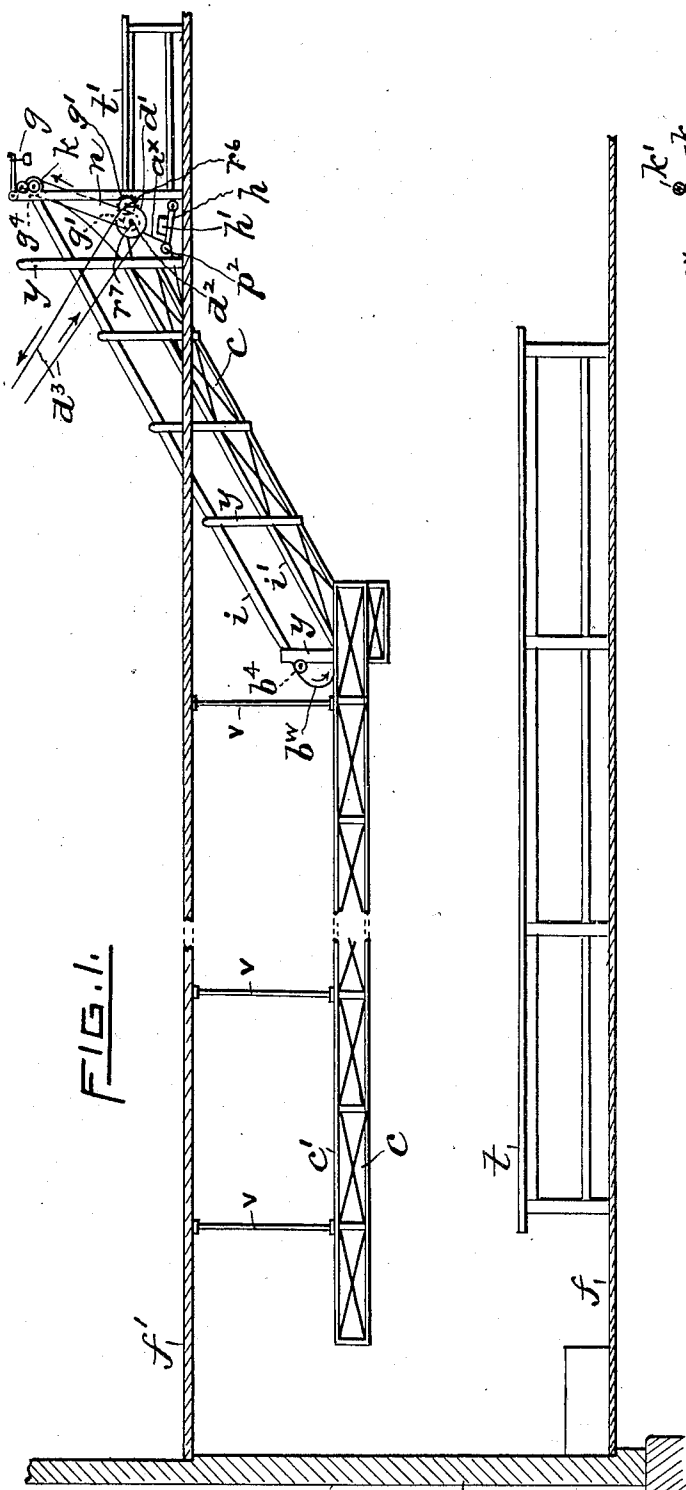


FIG. 1.

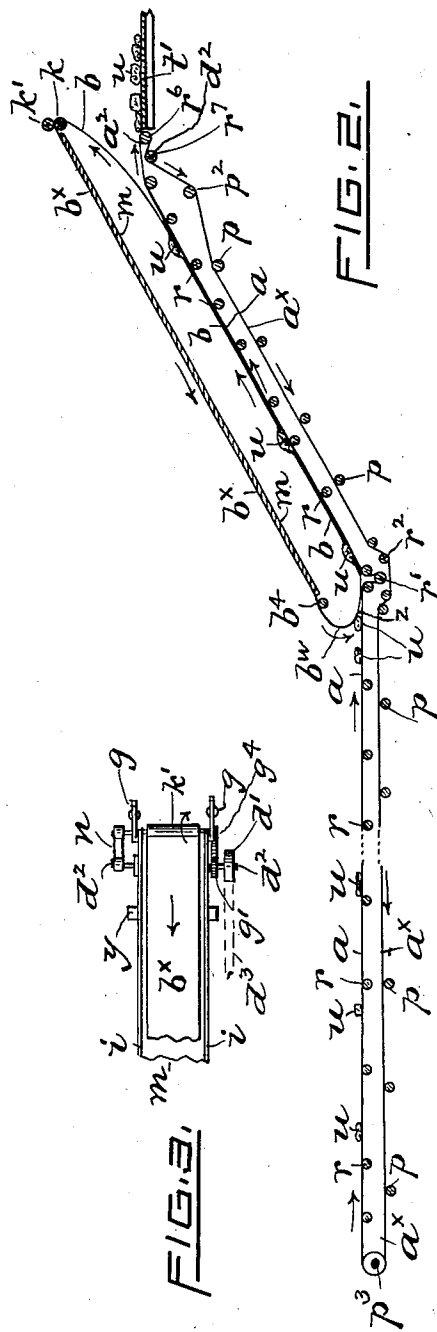


FIG. 2.

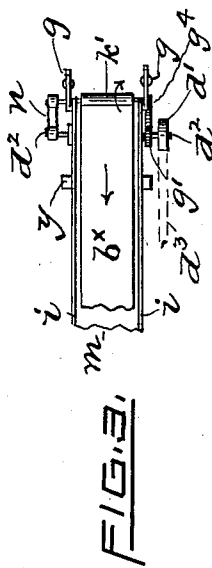


FIG. 3.

WITNESSES.

C. T. Hannigan.
Calvin H. Brown

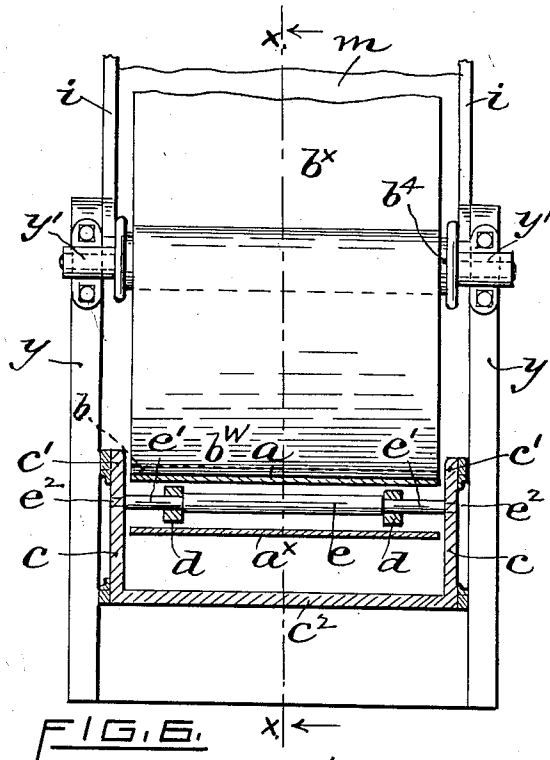
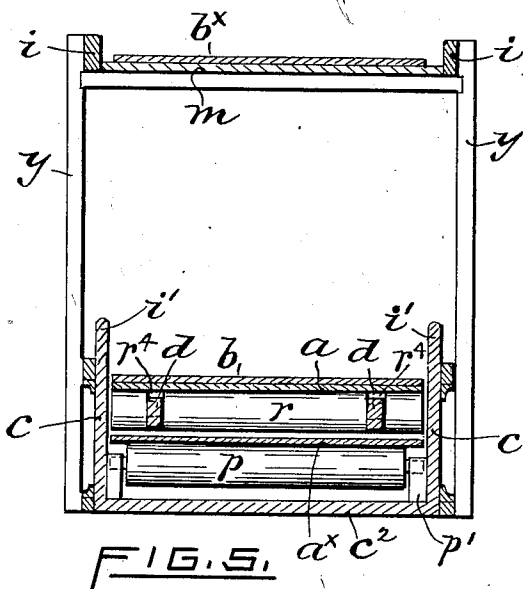
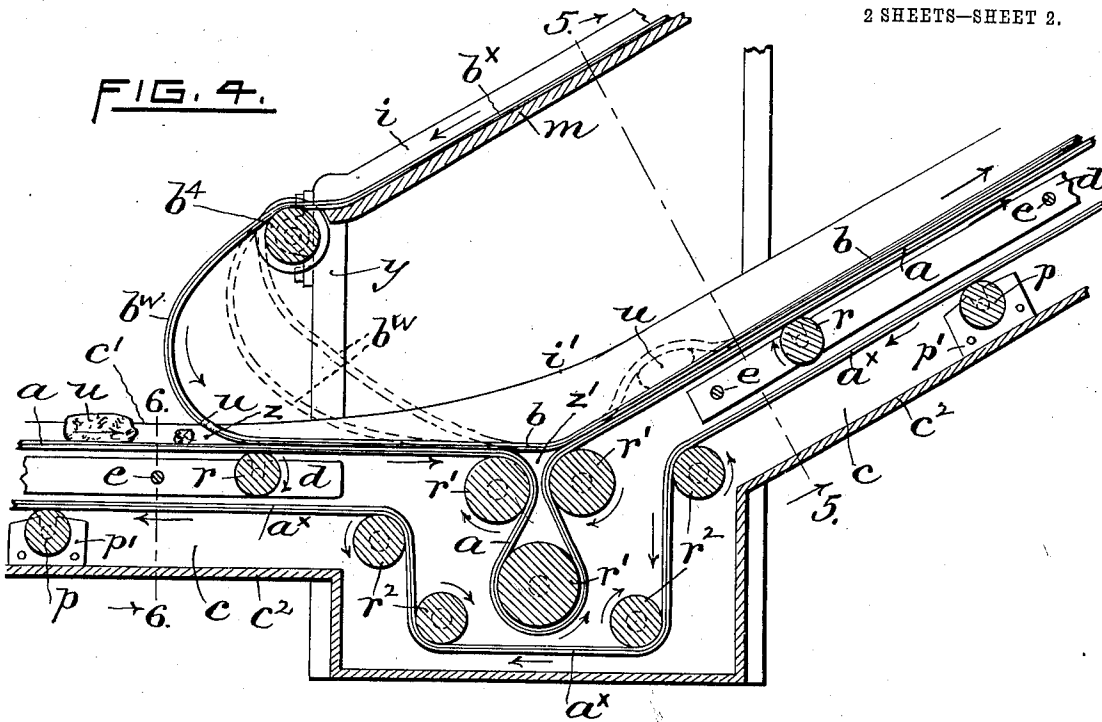
INVENTOR.

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2 SHEETS—SHEET 2.

FIG. 4.



WITNESSES,
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UNITED STATES PATENT OFFICE.

JOSEPH B. MONETTE, OF PROVIDENCE, RHODE ISLAND

BELT CONVEYER SYSTEM.

No. 890,292.

Specification of Letters Patent.

Patented June 9, 1908.

Application filed February 17, 1908. Serial No. 416,204.

To all whom it may concern:

Be it known that I, JOSEPH B. MONETTE, a citizen of the United States of America, and a resident of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Belt Conveyer Systems, of which the following is a specification.

This invention relates to improvements in what are termed belt-conveyer or traveler systems wherein continuously propelled belts are employed for conveying or transporting merchandise or articles placed thereon from one part of a plant or store to another portion of it, or to elevate the goods from one floor to another, and it consists in the novel construction, arrangement and manner of mounting the belts and cooperating devices, all as more fully hereinafter set forth and claimed.

The object of the invention is to provide stores, markets, &c., with improved means for carrying the customer's purchases from the salesman to the packing and shipping departments. The invention is, however, more particularly adapted for elevating the thus sold goods or merchandise to a higher plane or floor and discharging the same onto a conveniently located stationary table.

By means of this improvement the efficiency of the conveyer system is greatly increased; it is positive in its action and conveys the goods without injury; it readily adapts itself to the conveyance of packages or articles placed indiscriminately upon the belt and varying greatly in size, form and weight, and the cost of installation is relatively small when compared with other conveyer systems employing belts having a corresponding width.

In the accompanying two sheets of drawings, Figure 1 represents a side elevation of a conveyer system embodying my improvements. Fig. 2 is a corresponding longitudinal sectional view, showing the general arrangement of the belts, mountings, &c., the frame or housing being omitted. Fig. 3 is a top plan view, showing the upper or delivery end portion of the apparatus. Fig. 4 is a partial longitudinal sectional view, in enlarged scale, taken on line *xx* of Fig. 6. Fig. 5 is a transverse section taken on line 5 5 of Fig. 4, and Fig. 6 a similar section taken on line 6 6 of Fig. 4.

In the drawings, Fig. 1, *N* designates a wall and *f* and *f*¹ lower and upper floors, respectively, of a building having my improved belt-conveyer system installed therein. The laterally separated vertical sides *c c* and bottom *c*² of the housing are suitably supported by rods *v* and posts *y*. The conveyer proper consists of the two positively driven endless belts *a* and *b*, made of leather or other suitable flexible material. Said letters, *a b*, also respectively designate the pulling or driving sides of the belts, while *a*^x and *b*^x indicate the other or normally "slack" sides.

The main conveyer-belt *a* as represented in the drawings has one portion thereof disposed in a horizontal plane, the other portion extending upwardly in an inclined plane at an angle of about 30°. As drawn, the delivery or discharge portion of the belt passes over and in frictional contact with the driven upper or head roll *r*⁶, located contiguous to the receiving table *t*. Power is transmitted from a continuously running belt *d*³ to a pulley *d*¹ secured to shaft *d*² carrying the driving-roll *r*⁷. Intermeshing spur gears *g*¹ fixed to the front end of the shafts of said rolls, *r*⁷, *r*⁶, positively rotate the latter in opposite directions and in unison.

The upper or driving side of the belt *a* is supported on suitably spaced freely revoluble transversely arranged wooden rolls *r*. See also Figs. 4 and 5. Each roll *r* is necked or reduced in diameter near its ends, see *r*⁴ Fig. 5, thus forming journals revoluble in the narrow longitudinally extending stationary wooden rails *d*. The latter in turn being maintained in a fixed position with respect to the housing by transverse wooden space pins *e*, these are reduced at *e*¹ to pass through the rails and again at *e*² to snugly enter and be confined in corresponding holes formed in the sides *c* of the housing. See Fig. 6. At the intersection of said horizontal and inclined planes or sections are mounted a set of three horizontal revoluble rolls *r*¹ (Fig. 4) for guiding the belt *a* at that point; the two upper ones revolve in one direction and are separated laterally so as to permit the passage of the adjacent portions of the traveling belt, as clearly shown. The lower or normally slack side *a*^x of the belt extends downwardly from the driving roll *r*⁷, under the swinging weight or take-up roll *p*², thence over the series of supporting rolls *p* revoluble in bearings *p*¹,

round the four freely turning supporting and guide rolls r^2 (Fig. 4) disposed with respect to said rolls r^1 , and over the series of supporting rolls p located in the horizontal plane, and finally over the enlarged initial or tail roll p^3 to the said upper set of supporting rolls r .

The companion or auxiliary endless conveyer-belt b before referred to is represented as extending upwardly and parallel with the said inclined portion of the main belt a . This belt, b , is also positively driven, the means therefor, as drawn, being as follows:—The lower or delivery side of the belt passes between and in frictional contact with the faces of the suitably mounted upper and lower horizontal rolls, k^1 , k . The lower or driving roll k is rotated by power transmitted by belt n from a pulley secured to the rear end of the said shaft d^2 of roll r^7 . See Figs. 1 and 3. The size of the pulleys, &c., are proportioned so that the driving or conveying sides of the two belts, a and b , are propelled in unison, the rate of speed being substantially the same for both. The upper roll k^1 is provided with a weighted lever g , &c., for varying the degree of pressure upon the belt b at that point. The lower or driving side of belt b is materially longer than the upper or normally slack side, thereby producing a considerable excess or amount of looseness at its lower or receiving end portion, as indicated at b^w . See also Fig. 4. The weight of said driving side of the belt tends to normally keep the said loose portion thereof at the lower end, the other part of the driving side at the same time resting directly upon, being supported by and moving in unison with the corresponding driving side of the inclined portion of belt a . The upper side b^x of belt b is supported by and is adapted to slide freely upon the inclined stationary base or board m , in turn supported by posts y or other suitable means. Narrow side flanges i serve to maintain the belt in position laterally. At the foot of said incline the belt part b^x runs over a flanged guide-roll b^4 revoluble in bearings y^1 ; shown also in Fig. 6. Fixed upper side guard-rails or flanges c^1 extend along the horizontal portion of belt a and merge into corresponding members i^1 extending throughout the length of the inclined part, between which members the then two contacting belts, a b , upwardly travel.

Assuming now that the two continuously propelled conveyer-belts and the several coöperating devices have been constructed, arranged and positioned substantially as represented in the drawings, the manner of operation may be described as follows: The salesman removes from the table or counter the goods or merchandise purchased by the customer and places them singly and indiscriminately (indicated at u) upon the conveniently accessible upper or exposed side of

the horizontal portion of the quickly moving belt a ; the latter now carries the thus deposited articles u to the continuously open wedge-shaped mouth or receiving end z , formed at the point where the said lower loose or surplus portion b^w of the correspondingly moving auxiliary upper belt b impinges lightly upon the proximate surface of the fellow belt a . The articles u are successively received between the belts at said point z , the upper belt at the same time flexing so as to infold or approximately conform to them; the continued and conjoint movements of the belts carry the articles up the incline. At the point where the two belts separate from each other the lower one continues a short distance further in a nearly horizontal plane (see a^2 Fig. 2) and successively discharges or delivers the articles u upon the receiving table t for the packers and shippers, followed by passing the belt over the head roll r^6 , the fellow driven roll r^7 , the take-up roll p^2 , the several supporting rolls p and r^2 and back to the enlarged tail roll p^3 , as before stated, thus completing the operation. It may be added that, as drawn, Fig. 1, the take-up roll p^2 is revolubly mounted in a swinging arm h carrying a movable weight h^1 , the device being employed for automatically taking up the stretch or slackness of belt a .

By means of this improvement, hereinbefore set forth, it is obvious that practically no pressure is borne by the articles or units u during their conveyance up the inclined plane, and there is no tendency of the unit to slip or slide because the two conveyer-belts enveloping it move in unison and are always in frictional contact with each other sufficiently to prevent one belt from sliding upon the other.

After a unit has been carried along by the belts from the point z to the small space z^1 , lying between the two upper parallel rolls r^1 at the junction of the horizontal and inclined planes (Fig. 4), the action of the two belts together with the direction of rotation of the right upper roll r^1 serves to still maintain the unreleased unit between the belts a and b and carry it to the receiving table, as before described. In case the unit is relatively small it may be temporarily released for an instant at the point z^1 , the joint action of the two belts, however, immediately picks it up between them again and then transports it to the place of delivery. Obviously no unit small enough to drop through the narrow space lying between the adjacent faces of the belt a running around said two rolls r^1 would be fed to the conveyer.

The lower or driving side of the freely flexible auxiliary belt b is materially longer than its upper or return side, as before stated, thereby providing a considerable extent of

looseness, b^w , at the lower or feed end portion where the units are introduced between the two belts. This is done in order to allow the belt to receive and adapt itself to a number of units, and still be in ample frictional contact with belt a along the inclined section, without rendering it too contracted or taut at the free end. The dotted lines, Fig. 4, indicate different positions of the belt portion b^w corresponding to the presence of more or less units while the latter are being carried upwardly on the inclined part of the conveyer.

It may be added that in my improved belt-conveyer system no moving chains or links or other analogous means are associated with or employed for driving and directly supporting the two working or conveyer-belts, a and b . The said belts are flat and flexible (the upper one, b , preferably possessing the greater degree of flexibility) and have the contiguous working sides or runs thereof in continuous actual contact with each other and also traveling in unison or concurrently. The belt b has an excess of slackness, b^s , or reserve length at its lower end portion so as to provide or compensate for the amount of said part that may be taken up by the articles while they are being conveyed up the incline. The belt is capable of readily bending or flexing so as to automatically adapt itself to articles or packages, u , varying more or less in size, placed at intervals upon the upper or working side of the continuously traveling main belt member a , as they successively arrive at and enter the open mouth or point z between the belts. The construction, arrangement and manner of operation of the belt b constitutes an important feature of my present invention.

I claim as my invention, and desire to secure by United States Letters Patent:—

1. In a belt-conveyer system, the combination with a suitably supported flexible linkless endless main conveyer-belt, and means for propelling the same, of an auxiliary flexible linkless endless fellow conveyer-belt mounted above and having its working portion or run normally supported by and directly superposed upon the upper working part or run of said main-belt and also arranged to be propelled at substantially the same rate of speed as the main-belt; the said working portion of the auxiliary belt member having increased slackness or surplus stock at its lower end whereby it is capable of automatically flexing so as to adapt itself to successively receive and partly unfold articles or packages varying in size disposed at intervals along the adjacent working surface of the main-belt.

2. In a belt-conveyer system, the combination of an endless flexible linkless main

conveyer-belt, an endless flexible linkless auxiliary conveyer-belt having its driving or working side in continuous direct contact with and supported by the upper or driving side of said main-belt, and means for propelling the two belts in unison at a substantially uniform rate of speed; the said lower or driving side of the auxiliary belt member being materially longer and slacker than its other or normally slack side portion so as to provide means or allow for the taking up of the belt by the articles or packages while they are being conveyed up the incline, the auxiliary belt at the same time approximately conforming to the outline of the articles being conveyed.

3. In a belt-conveyer system, the combination of an endless flexible and pliable main lower belt and an endless upper flexible and pliable auxiliary conveyer-belt member having the proximate portions of the two belts in actual normal frictional contact with each other and constituting the driving sides or runs of the belts between which the articles to be transported are introduced, conveyed and discharged; the driving side of the main-belt being substantially flat and taut, and having the lower or feed end portion of the upper belt provided with an excess amount of surplus stock whereby the belt is rendered capable of approximately adapting itself to the shape of the various articles being conveyed and hold them in place while they are being transported, and means for propelling the belts at a substantially uniform rate of speed.

4. In a conveyer-belt system, the combination of a suitably supported endless main conveyer-belt arranged in horizontal and inclined planes, a tension or take-up device for said belt, an endless auxiliary conveyer-belt disposed above and substantially parallel with the inclined portion of said main belt, the lower side of the auxiliary belt and the upper side of the main belt constituting the working or driving sides and being in continuous normal contact with each other and capable of yielding so as to receive individual articles between them, and having the lower portion; b^s , of the auxiliary belt extending in a loose manner at the receiving end of the runway whereby the belt is capable of approximately conforming to the outline of the articles being conveyed, means for varying the tension of the auxiliary belt, and means for driving both belts at a substantially uniform rate of speed.

5. In a belt-conveyer system, the combination of an inclined endless conveyer-belt having its upper or driving side supported on friction rollers spaced to prevent it from sagging, an endless auxiliary conveyer-belt mounted above and substantially parallel with said main belt having its lower or driv-

ing side resting upon and supported by direct
contact with the driving side of the main
belt, a stationary board or member for slid-
ably supporting the upper side of the aux-
iliary belt, the driving side of the latter being
5 materially lengthened so as to adapt it to au-
tomatically fold or wrap itself partly around
the articles being conveyed, and mechanism

for propelling the two belts at a substantially
uniform rate of speed. 10

Signed at Providence, R. I., this 14th day
of February 1908.

JOSEPH B. MONETTE.

Witnesses:

GEO. H. REMINGTON,

HENRY P. STONE.