

June 23, 1936.

A. F. HANNEY

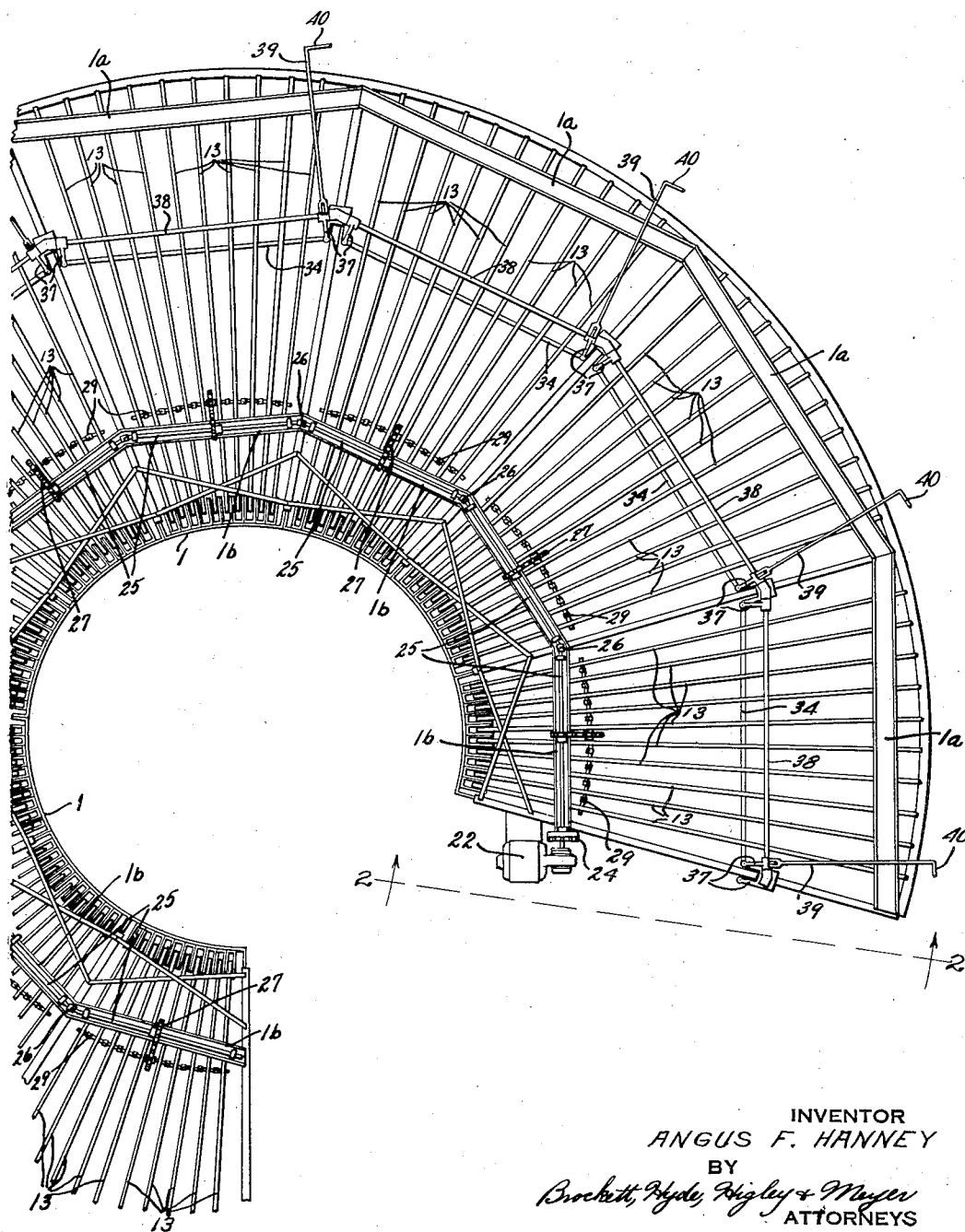
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LAUNDRY ASSORTING MECHANISM

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5 Sheets-Sheet 1

Fig. 1.



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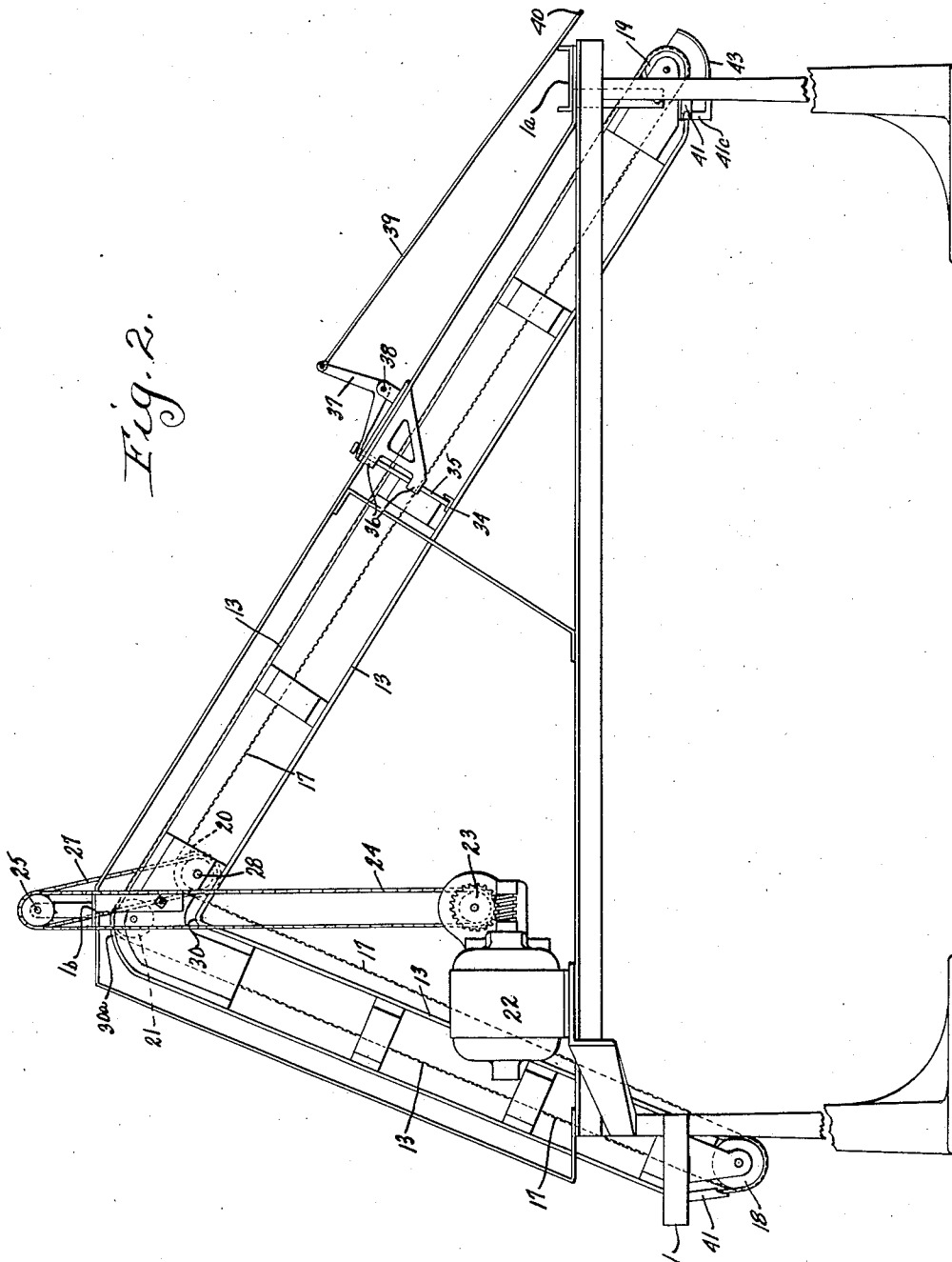
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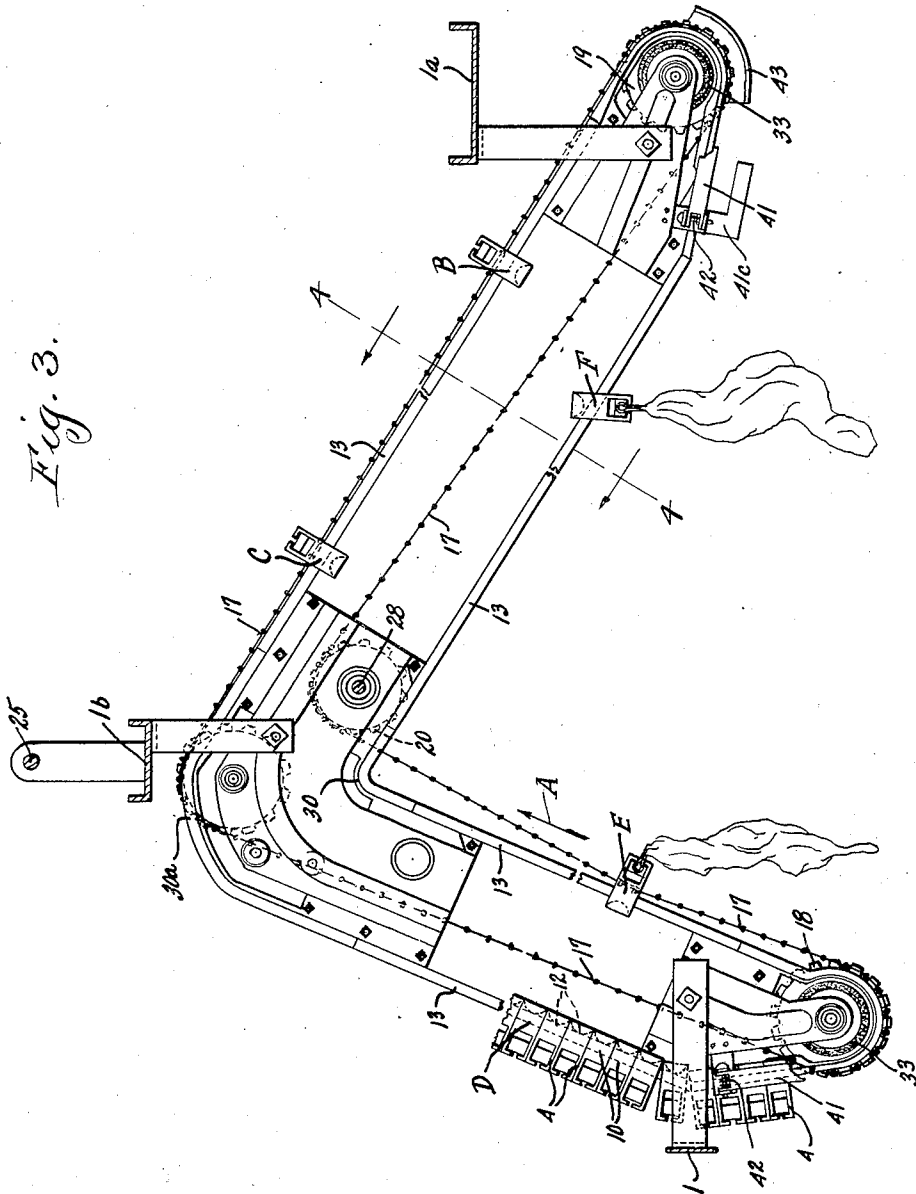
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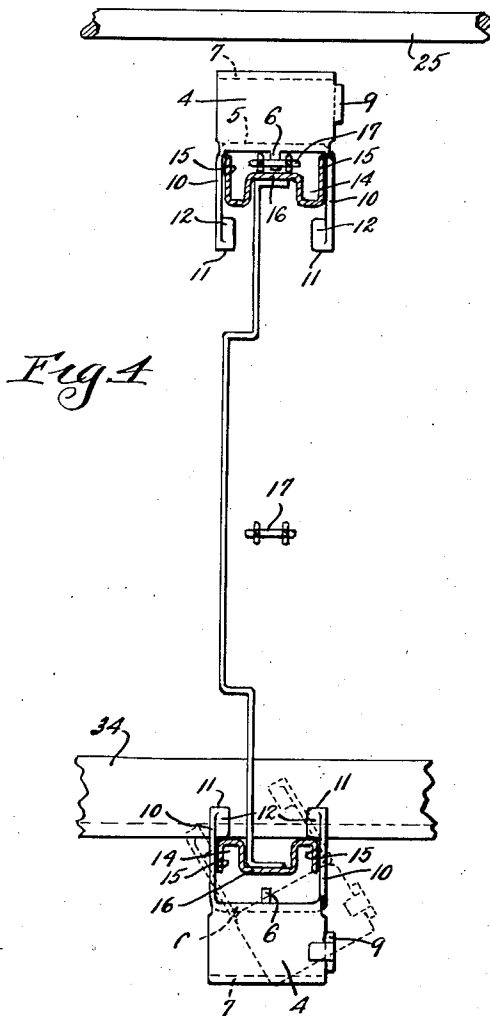


Fig. 4

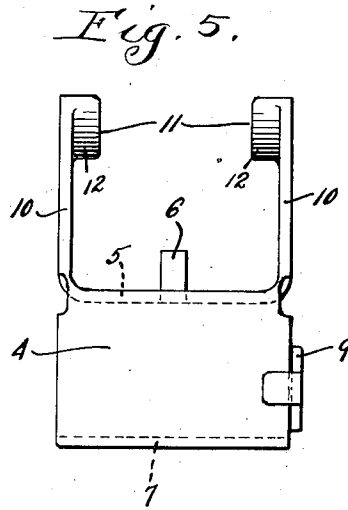
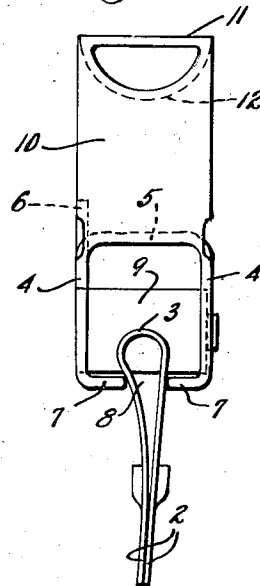


Fig. 5



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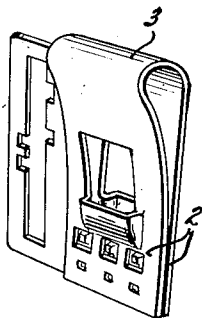


Fig. 7

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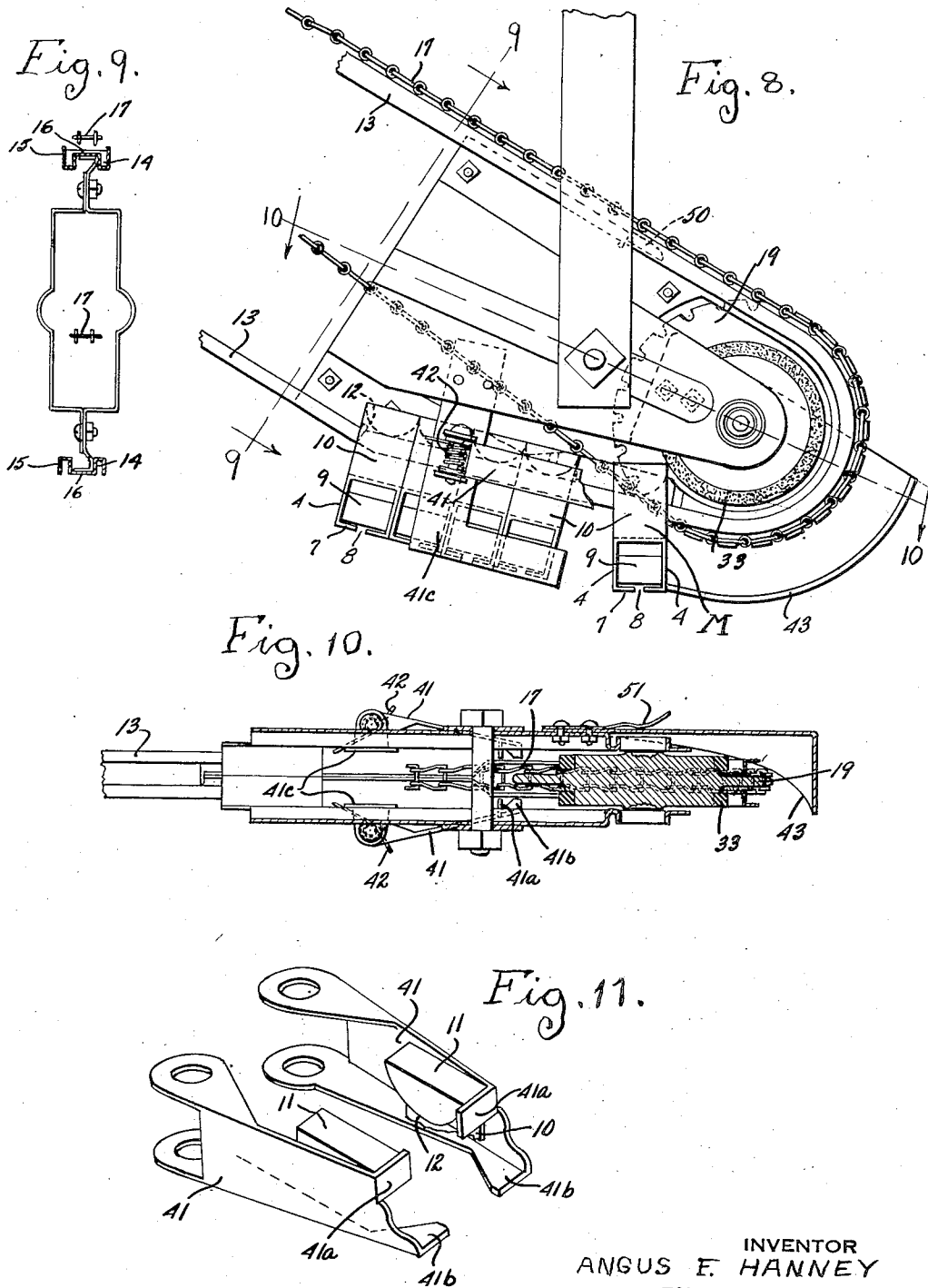
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LAUNDRY ASSORTING MECHANISM

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UNITED STATES PATENT OFFICE

2,045,351

LAUNDRY ASSORTING MECHANISM

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Application November 3, 1932, Serial No. 641,109

12 Claims. (Cl. 209—123)

This invention relates to laundry assorting mechanism and more particularly to such mechanism designed for use in connection with laundry work where each piece of work is identified by a marker or clip attached thereto. The objects of the invention are to materially facilitate the assorting and distribution of laundry marked with identifying clips; to provide assorting mechanism involving carriers and conveyors for moving the identified and assorted goods away from the assorting station, but which nevertheless brings the assorting ends of all conveyors into close relation at the sorting station for convenient use of the assorting operator, but in which said conveyors diverge as they move away from the assorting station to give room for the work attached to or moved by said conveyors; to provide improved mechanism of this kind including a track or rail along which carriages are moved capable of receiving the identifying clips and supporting the same and the goods identified thereby, and in which the carriages and clips are moved along said track by operating mechanism, such as a chain, to a position where they travel by gravity free of connection to the operating means; to provide mechanism of this kind in which an entire lot of laundry may be assorted, distributed and accumulated in lots or batches preparatory to release at will for the bundling operation; and finally, to provide a system of this kind embodying clip carriages of such form as to readily receive and discharge the clips and which are of convenient form for mechanical operation in the manner described, and wherein automatic means is provided for separating the clips from the carriages at the bundling station.

Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

In the drawings, Fig. 1 represents a plan view of a portion of a laundry assorting machine or apparatus embodying my invention; Fig. 2 is an end elevation looking at the mechanism along the line 2—2, Fig. 1, and to avoid confusion illustrating but a single element of the machine; Fig. 3 is a similar elevation, on a larger scale, to illustrate the chain conveyor mechanism and its associated parts; Fig. 4 is a detail sectional elevation on approximately the line 4—4, Fig. 3, looking in the direction of the arrows; Fig. 5 is an end view of one of the clip holding carriages; Fig. 6 is a side view thereof with a clip in place; Fig. 7 is a perspective view of a clip; Fig. 8 is a detail elevation, illustrating a yielding gateway; Fig. 9 is a detail sectional elevation on approximately

the line 9—9, Fig. 8; Fig. 10 is a sectional plan view, on approximately the line 10—10 of Fig. 8, illustrating the automatic clip removing cam; and Fig. 11 is a detail perspective view of the movable gate member.

The mechanism illustrated in the drawings is intended for use in the assortment of laundry work in which the several pieces are identified by the attachment to each piece of a suitable identifying clip, such, for example, as the clip illustrated in Fig. 7 and comprising resilient jaws 2 normally closed together and adapted to be opened and closed to clamp them upon the piece of work, said jaws being connected by the arched or curved head 3. Laundry clips of this character are now in use and are illustrated, for example, in the patent to Edwin Lane, No. 1,501,003, July 8, 1924. A given lot of laundry work, including the bundles or lots of a number of different patrons are separately identified by attaching clips of a given set and identifying number to each piece of one patron's lot of goods and clips of another set with a different identifying number to the number to the pieces of a lot of another patron's goods, and so on, and the entire series of lots of goods is sent through the different laundry operations en masse, emerging in a mixed assembly of different pieces of various lots of goods. It is necessary to assort these goods into the different lots, collect the lots together, fold and wrap the articles. Experience shows that this operation is best carried out by work done at an assorting station where the assorting operator has convenient access to a number of devices each designed to receive the articles of a given lot, and said articles in groups or singly being moved away from the assorting station by diverging paths to give room for the accumulation of the goods assorted. Preferably, therefore, I arrange my mechanism in somewhat wheel form, with the assorting station at the hub, from which radiate a series of like conveyors, diverging as they extend outwardly, for the purpose stated. One conveyor is used for each lot of goods and with it and upon it are collected and accumulated as they come out of the mass of articles, all the identified articles of a single lot, so that the lots ultimately become separated from each other with each lot containing all articles which make it up. The mechanism involves a suitable framework supported upon the floor or suspended from the ceiling, or both, with the inner assorting or feeding ends of the conveyors and the outer delivering or bundling ends of the conveyors convenient for access by the assorting and bundling operators respectively. If

these parts of the conveyors are suspended or supported at body height from the floor, the wheel may be complete and access to the assorting station within it may be gained beneath the conveyor parts, but for convenience I illustrate the mechanism in Fig. 1 as having a gap producing an entry aisle through which the operators can move and trucks containing laundry work can be passed, etc.

The mechanism comprises a suitable frame including an inner ring 1, an outer member 1a and an intermediate member 1b suitably supported and which serve to carry the parts of the apparatus. They are connected by a series of conveyors each including an endless track for supporting a series of carriages, together with means for moving the carriages along said track, such as an endless chain. All conveyors are alike, so that description of the construction and operation of one thereof will suffice for this application.

The conveyors are preferably arranged in groups, say of ten each, so that in certain respects they can be operated as groups, as will appear.

The carriages may be of any suitable form for the purpose, one form being illustrated, described in detail and claimed in my copending application for Carrier for laundry assorting machine, filed of even date herewith, Serial No. 641,110. In the arrangement shown herein, each carriage comprises a body portion including two parallel walls 4 joined at their upper edges by a wall 5 having a piece of the metal bent upwardly to form a lug 6, and at their lower edges provided with flanges 7 extending toward each other in the same plane and separated by a gap 8. The ends of the walls 4 are joined by a cross wall or abutment 9, so that the walls of the body together enclose a small chamber substantially closed at one end and at its top, open at the other end, and with a slot in its bottom. Projecting upwardly from the body 4 are two parallel arms 10, the free ends of which are provided with inwardly extending but separated lugs 11 having rounded bottom surfaces 12. The metal walls 4, while parallel to each other, lie in planes at right angles to the metal arms 10.

Said carriages are designed to support the clips attached to the pieces of laundry work, each clip being capable of assembly with the carriage by pushing it laterally into the chamber within the body so that its head 3 lies within said chamber with the clip depending through the slot or gap 8, as shown in Fig. 6. It will be appreciated that the clips can be assembled with or removed from the carriages by simple right line movement into and out of the position shown in Fig. 6. These carriages are designed to travel along an endless track or rail marked generally 13 in Figs. 2 and 3. In said views the loading or assorting station is at the left and the delivery or wrapping station at the right, and the track 13 has two parallel portions extending upwardly and outwardly or to the right from the loading or assorting station and two other parallel portions that extend downwardly and outwardly, or to the right in said views. The track itself in cross section is of the form illustrated in Fig. 4, being formed of sheet metal bent to form two U-shaped or channeled members 14 with outer flanges 15 widely separated and with their inner flanges connected by a wall 16.

As shown in Fig. 4, the upper portion of the track, or more accurately, its upper stretch, has its U's or channels opening upwardly, while the

lower stretch of the track has its U's opening downwardly. The carriages surround or embrace the track and in operation move along the track from station to station and back again, not being removed from the track during operation of the mechanism. Said carriages, however, may be readily attached to or removed from the track by tilting them to the dotted line position shown in Fig. 4, as will be readily understood. When the carriages are moving along the lower stretch of the track they are supported from the bottoms of the U's, which are presented upwardly and upon which the lugs 11 ride. When the carriages are on the top stretch of the track, they are supported upon the edges of outer flange 15, which support the body portions 4, now at the top.

Suitable means is provided for moving the carriages along the track, the means in this case being an endless chain 17 passing over inner and outer sprockets 18, 19 and a pair of intermediate sprockets 20, 21. The chains are driven by suitable mechanism, such as an electric motor 22, for actuating a stub shaft carrying a sprocket 23 from which an endless chain 24 extends to a sprocket on an overhead shaft 25. This shaft extends continuously around the machine, including a number of segments, one for each group of ten conveyors, the said segments connected by universal joints 26, and each of the sections of shaft 25 drives the conveyors of its own group by an endless chain 27 extending from a sprocket on shaft 25 to a sprocket on the shaft 28 which carries the intermediate sprockets 20 of the several conveyors of the group. As a result, when the machine is operating, all of the chains 17 are driven from the same motor 22 and are constantly running as will be readily understood. Shaft 28 for each group, of course, also consists of a number of short sections connected by universal joints 29, to compensate for divergence of the conveyors.

The chains 17 drive or move the carriages along the rails by engagement of the chain links with the lugs 6 of the carriages. Referring to Fig. 3, and assuming one of the carriages depending at the assorting station at sprocket 18 and remembering that sprocket 18 rotates in the counterclockwise direction, Fig. 3, it will be observed that a carriage advancing from the assorting to the bundling station moves in the direction of arrow A along the bottom stretch of the track, with the chain beneath the track until said carriage reaches the crest of the bend at 30. Here the chain 17 moves upwardly and departs from the carriage, travelling above the sprocket 20 and above the track 13, and the carriage is free to slide down upon the track toward the bundling station. When the article and clip are taken off from the carriage at the bundling station, the carriage is again advanced along the upper stretch of the rail, being moved along it by the chain which is now above the rail, as at B and C, operating connection again being by means of the lug 6. This operation continues until again the crest of the bend is reached at 30a, when the chain assumes a position beneath the track and the carriage slides down the track by gravity to position D.

A series of carriages is provided for each conveyor, the number thereof being sufficient to accept the maximum number of pieces in the lots of goods being assorted by this mechanism. At the beginning of an assorting operation the carriages are collected on a portion of the track

at position D, as shown in Fig. 3, being held there and being released, one by one, as needed, by the operation of gate mechanism later to be described. The same form of gate mechanism is used at both the loading and bundling stations and is illustrated in detail and will be described for use at the bundling station. In the assortment of work the operator opens out one piece of work, locates the clip thereon, decides by its identifying characteristic to which conveyor it should be assigned, and introduces the clip on the piece into the lowermost carriage on that conveyor. She then pulls the clip and carriage downwardly. It immediately engages with a pair of friction surfaces upon sprocket 18, such as the rubber tires or rings 33 on said sprocket, which frictionally advance the carriage with the sprocket 18 and along the track to the upwardly extending portion thereof. As the carriage leaves the sprocket the chain links engage with the lugs 6 of the carriage and the chain now moves the carriage upwardly along the track, as at E, until the chain becomes disconnected from the carriage and the carriage slides down by gravity, as at F. This operation is repeated with piece after piece, the clip of each piece being inserted in one of the carriages on the proper conveyor and the carriage started on its outward journey to the bundling station.

Each conveyor is provided with means adapted to accumulate on the gravity portion of its track all carriages delivered to it, so that all carriages can be held back until one complete mass of laundry work has been fully assorted and is ready for the bundling operation. This means is preferably arranged for manual operation in group form. In other words, the accumulating device operates over a range of the ten conveyors of a single group and is capable of release by the operator to permit all carriages of the ten conveyors in a group to be advanced simultaneously for the bundling operation.

Any suitable means may be used for this purpose, the means shown comprising a bar 34, shown as an angle iron, extending transversely across and above the ten tracks of a group of conveyors, said bar being connected to a pair of rods 35 sliding in guides 36 on the frame, each of said rods having a head adapted for operation by one arm of a bell crank lever 37, the two bell crank levers being connected to a shaft 38 and one thereof having operating means connected thereto, such as a link 39 provided with a handle 40. The carriages with the clips attached thereto slide down the gravity portion of the track and are stopped by the bar 34 until the particular mass of work is fully assorted. When the signal is given by the assorter to the bundle operator, she pulls one of the handles 40 and thereby permits all carriages on the ten conveyors to slide toward the delivery and wrapping station, where they are held back by manually operable gate mechanism. The same kind of gate mechanism is used for both the loading and bundling stations, so that description of one set of mechanism will suffice for both. It has been illustrated in detail, in Figs. 8, 10, and 11, as used at the bundling station.

The gate mechanism comprises a pair of gate members 41, pivotally mounted, one at each side of the track and normally pressed toward each other by springs 42. The jaws or arms of the gate members are provided with abutment members 41a extending toward each other and normally lying in such position as to form positive

stops to meet and hold back the advancing carriages. Beneath the abutment members 41a a lower flange of each gate member is bent to horizontal position and is provided at its advance end with an inclined or cam portion 41b lying in such position as to be in the path of movement of the arms 10 of the advancing carriages. Fig. 8 shows a series of carriages in position at the bundling station and held back by the abutments 41a, the tags or clips and the work secured there- to being omitted for simplicity of illustration. The body portions or clip receiving portions of the first two or three carriages lie opposite a shield 41c, which is a simple metal plate attached to the frame and adapted to close the open ends of those carriages opposite it and thereby prevent removal of the clips therefrom.

The bundling operator now proceeds with the bundling of a single lot of work. The carriages therefore are suspended on the track and are held back by the abutments 41a. She pulls down on the first piece of work, which causes the arms 10 of its carriage to engage the inclined or cam edges 41b and swing the gate members 41 apart and move the abutments 41a out of holding position. The first carriage consequently is permitted to pass by the hold back gate members and as soon as it does so the gate members immediately swing inwardly to the normal position shown in Fig. 10 and serve to hold back the remaining carriages. As the first release carriage is pulled downwardly and to the right in Fig. 8, it assumes a more or less cocked position, as shown at M, as the result of both the gravity effect and the pull of the operator upon the work, and its advance upper corners engage the rubber rings or tires 33, so that the carriage is now advanced with the chain and sprocket at the bundling station. It of course has moved beyond the end of the shield 41c, so that the operator can pull the clip out of the carriage, if she desires. Failing in that the clip is automatically ejected from the carriage, which may be accomplished by any suitable means, such as by an inclined cam 43 lying at one side of and adjacent to the carriage and being curved around the center of the sprocket 19. As the carriage travels along this cam the cam engages the clip in the carriage and ejects it laterally from the chamber therein, so that the piece of work falls off and is picked up by the bundler, who removes the clip, folds the article and proceeds in like manner with the article on the conveyor.

It should be noted that in the arrangement described in the drawings, the open ends of the carriages face toward one looking at Fig. 8, which is the most convenient arrangement for both of the loading and bundling operators. The loading operator inserts the clips into the carriages with a right hand motion and as she faces the loading end of one conveyor she is facing outwardly from the center of the entire machine and the open end of the carriage is at her right. At the bundling station the operator usually uses a detaching machine, which opens the clip so that the work is released therefrom and preferably she inserts the clip into said detaching machine with her right hand. As a consequence, it is desirable for her to remove the carriage from the conveyor with a left hand operation. Actually the bundling operator stands at the bundling end of the conveyor facing counter-clockwise in Fig. 1, with the detaching machine in front of her so that she can roll it along the floor ahead of her. Therefore, the end of the conveyor is at her left

and the open ends of the carriages are at the left so that she conveniently removes the clips from the carriages with a left hand operation.

After bundling all articles in the first group of ten lots, the assorter then moves to the next group of conveyors and raises its bar 34 to permit a second group of ten lots to move down, or, the same operation can be performed by another bundler if more than one bundler is used.

Upon ejection of the clip from the carriage, as described, the carriage continues with the sprocket 19 until it reaches the upper stretch of the conveyor, along which it is moved by the chain through positions B and C, Fig. 3, finally moving by gravity to position D, where it is again ready for use as before. Here the conveyor is provided with gate mechanism of the same kind illustrated and described as used at the bundling end of the conveyor. The carriages collect at the loading station in the manner shown at Fig. 3 and one by one are released from the gate and pulled down to be actuated by the conveyor in the manner before described. Of course, no shield or guard, as at 41c, is necessary at the loading station.

50, Fig. 8, illustrates a small block of hard wood which is inserted at the junction of the ends of those portions of the rails 13 which respectively span the long stretch and are secured to the framework at the bundling station, for the purpose of eliminating any metallic noise or click between the moving chain links and the ends of the rails and to also prevent the chain links from catching on the ends of the rails.

In Fig. 10, at 51, I have also illustrated a small spring clip attached by bolts to one side of the conveyor frame at the bundling station, for the purpose of removably holding an identification card.

The mechanism described is of very convenient form in that it brings together in very compact arrangement all necessary devices for enabling a mass of work to be quickly assorted and distributed in lot form. The mechanism operates continuously without attention by the operator except in the application of clips to the carriages and of release of the carriages for movement along the tracks. It is also convenient for use by the bundling operators, who have plenty of space for a table or other device for the wrapping operation, as will be readily understood. Other advantages of the invention will be readily apparent to those skilled in the art.

What I claim is:

1. Mechanism of the class described, comprising a plurality of track members diverging from an assorting station toward a delivery station, a series of carriers for each of said track members, each track member having advance and return portions connected in a continuous path each portion of which extends from station to station, means for causing travel of said carriers along said track portions, and holding means for said carriers in advance of each station.

2. Mechanism of the class described, comprising a plurality of track members diverging from an assorting station toward a delivery station, a series of carriers for each of said track members, each track member having advance and return portions connected in a continuous path each portion of which extends from station to station, means for causing travel of said carriers along said track portions, holding means for said carriers in advance of each station, and means for

releasing the carriers one by one from the holding means.

3. Mechanism of the class described, comprising endless track members having advance and return portions and extending from an assorting station toward a delivery station, each track portion sloping upwardly and then downwardly between stations, carriers, and means for advancing the carriers along the upwardly sloping parts only of said track members, comprising an endless chain movable adjacent to the upwardly sloping track portions in engageable relation with the carriers and adapted to release the carriers adjacent the downwardly sloping track portions.

4. Mechanism of the class described, comprising a series of endless track members having advance and return portions and extending from an assorting to a delivery station, each track portion sloping upwardly and then downwardly between stations, a series of carriers for each track member, each carrier having a tongue, and advancing means for said carriers, comprising an endless chain movable adjacent to the upwardly sloping track portions only and adapted to releasably engage the tongue of the carrier.

5. Mechanism of the class described, comprising a track having advance and return portions extending between two stations, each track portion sloping upwardly and then downwardly between stations, a carrier adapted to travel along the track, means for advancing the carrier along the upwardly sloping parts of the track, said means releasing the carrier along the downwardly sloping parts of the track, and a moving friction surface adjacent said track between the downwardly and upwardly sloping parts thereof, said surface being arranged to engage said carrier as it leaves the downwardly sloping track and to deliver the carrier to said upwardly sloping track in engagement with said means.

6. Mechanism of the class described, comprising a track extending from station to station, a carrier adapted to travel along the track and having a clip engaging slot extending transversely of the track, said slot being open toward one side of said track, means for moving said carrier along the track, and means adjacent a station for automatically moving said clip transversely of the track and out the open end of said slot as the carrier moves along the track.

7. Mechanism of the class described comprising a track having two stretches continuously connected, a carrier adapted to travel along said track, means for releasably holding said carrier on one stretch of said track, means for advancing the carrier along the other of said track stretches, and a moving friction surface adjacent said track intermediate said stretches, said surface being arranged to engage said carrier as it moves there-toward along said track from said holding means and to deliver said carrier to said advancing means.

8. Mechanism of the class described comprising a track, a carrier adapted to travel along said track, means for releasably holding said carrier on one portion of said track, a moving friction surface adjacent another portion of said track, conveying means for said carrier adjoining the delivery end of said moving friction surface, and said surface being arranged to engage said carrier as it moves theretoward along said track from said holding means and to deliver said carrier to said conveying means.

9. Mechanism as in claim 8 and wherein the carrier holding means comprises stop means

yieldingly maintained in position obstructing the passage of said carrier along said track, and cam means for releasing said stop means, said cam means being actuable in stop means releasing direction by a pull on said carrier in the general direction of carrier travel along said track.

10. Mechanism of the class described, comprising a plurality of track members diverging from an assorting station toward a delivery station, each track portion sloping upwardly and then downwardly between stations, a series of carriers for each of said track members, mechanism for elevating the carriers along the upwardly sloping portions of the track members and adapted to then release the carriers for travel by gravity along the downwardly sloping portion of the track members, said track members being arranged in groups of more than one, holding means for the carriers on the downwardly sloping portion of the tracks of each group, and means for independently actuating the holding means of the several groups for releasing the carriers held thereby.

11. Mechanism of the class described, comprising a track, a carrier having portions adapted

to slidably engage said track and having means adapted to receive and releasably support an article holding tag, a conveyor extending along said track and having a portion adjacent said track and a portion spaced therefrom, means on said carrier adapted to be drivingly engaged and disengaged by relative approach and separation between said conveyor and carrier, and means for automatically releasing the tag from the carrier.

12. Mechanism of the class described, comprising a plurality of tracks diverging from an assorting station toward a delivery station, a series of carriers for each of said tracks, each carrier having track engaging portions and means adapted to receive and releasably support an article holding tag, a conveyor extending along each track and having a portion adjacent said track and a portion spaced therefrom, means on said carriers adapted to be drivingly engaged and disengaged by relative approach and separation between said conveyor and carriers, and means for automatically releasing the tag from a carrier as the latter moves along the track.

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