

May 1, 1923.

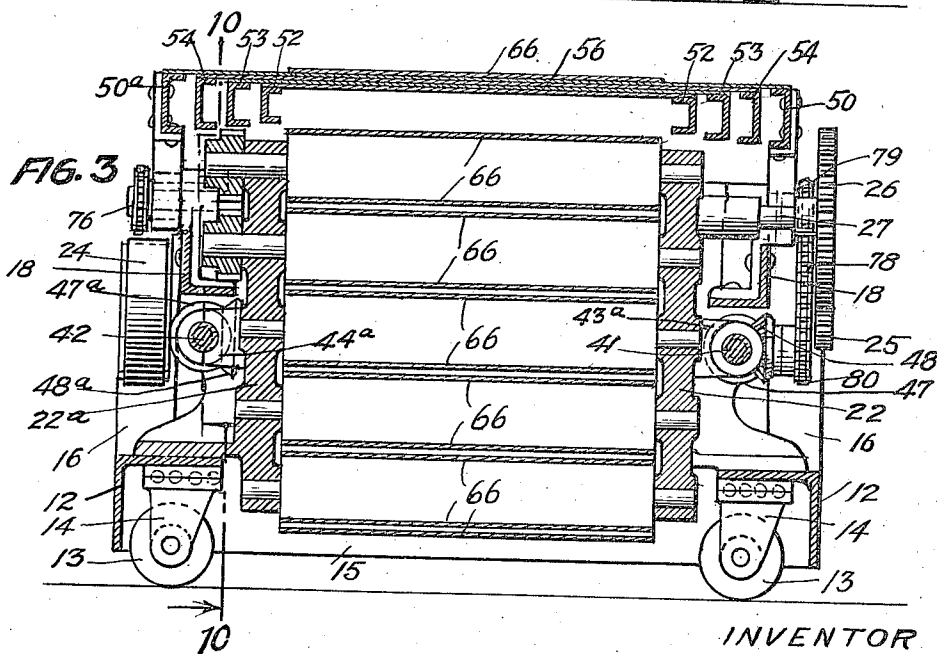
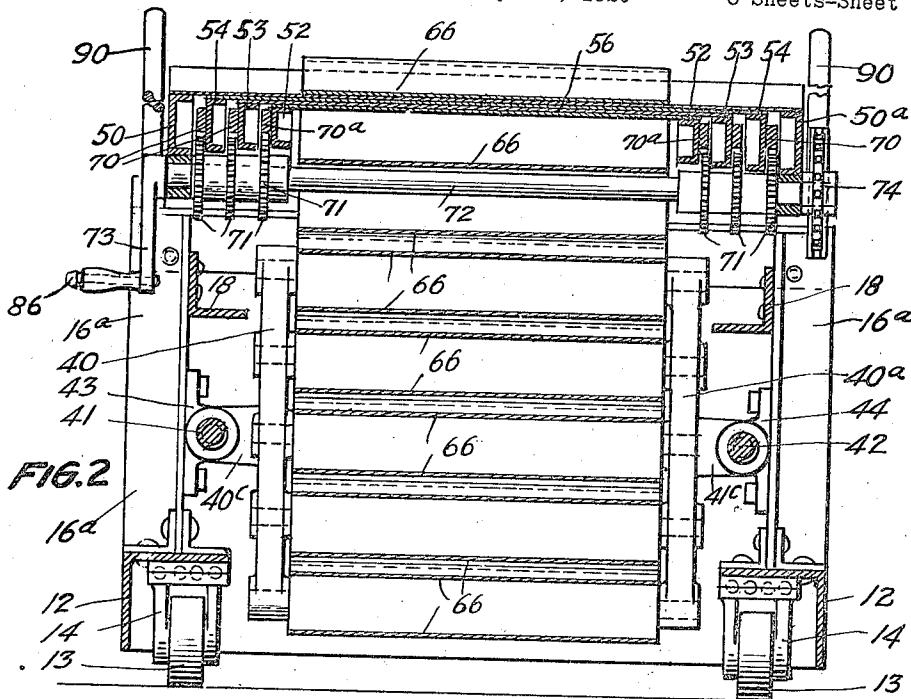
J. JESSEN

1,453,393

PORTABLE EXTENSIBLE CONVEYER

Filed May 14, 1920

6 Sheets-Sheet 2



INVENTOR
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May 1, 1923.

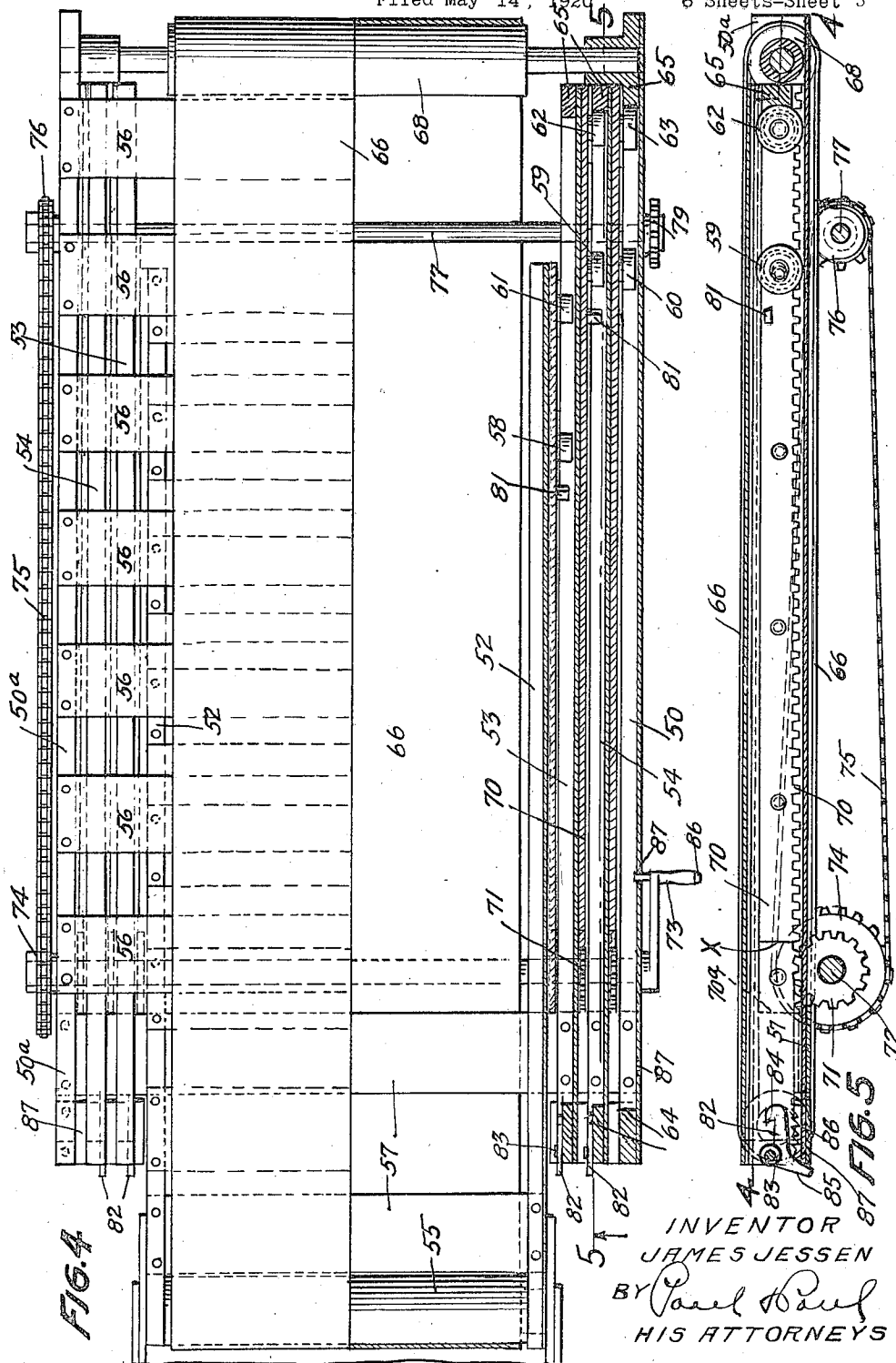
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PORTABLE EXTENSIBLE CONVEYER

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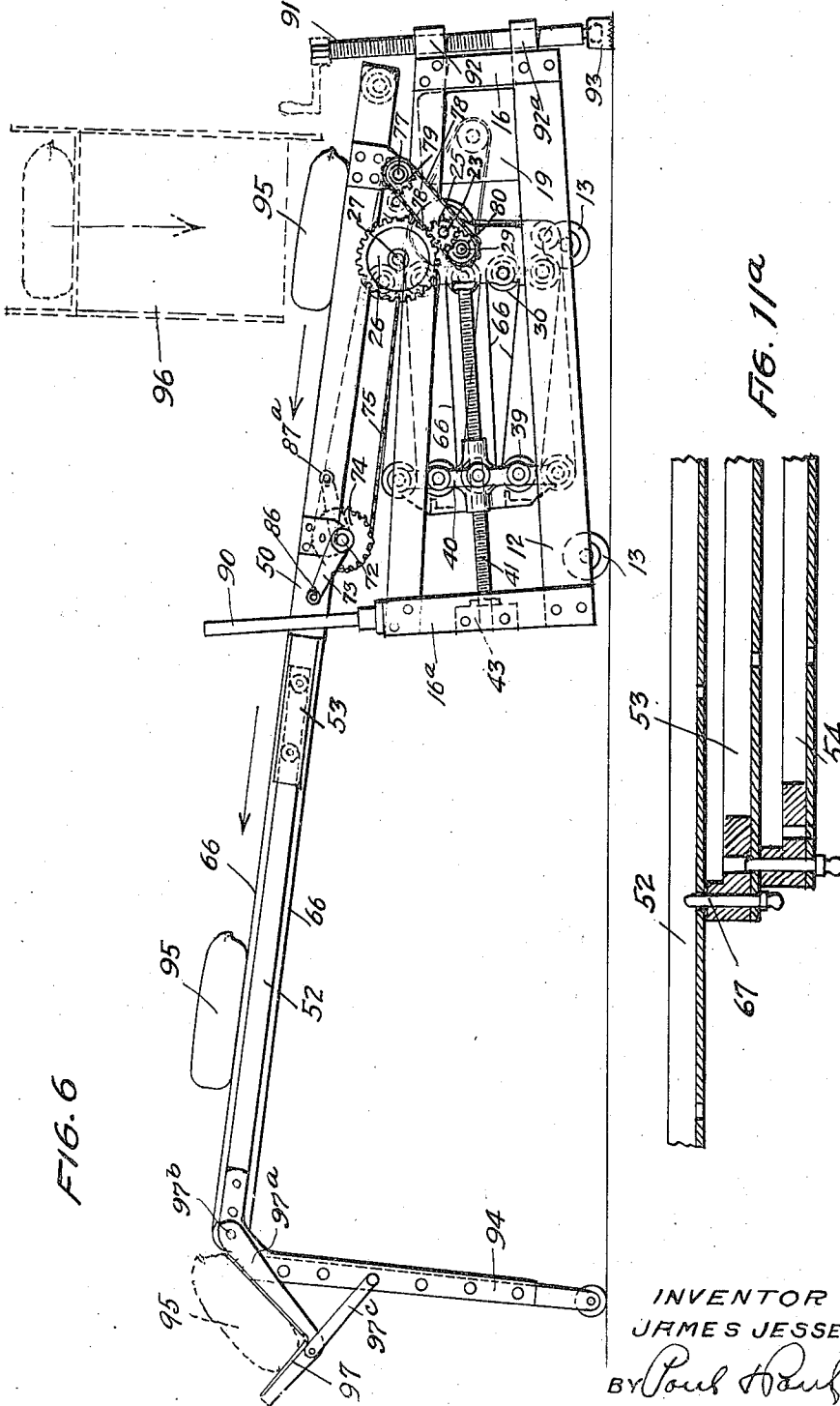
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PORTABLE EXTENSIBLE CONVEYER

Filed May 14, 1920

6 Sheets-Sheet 4



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1,453,393

PORTABLE EXTENSIBLE CONVEYER

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6 Sheets-Sheet 5

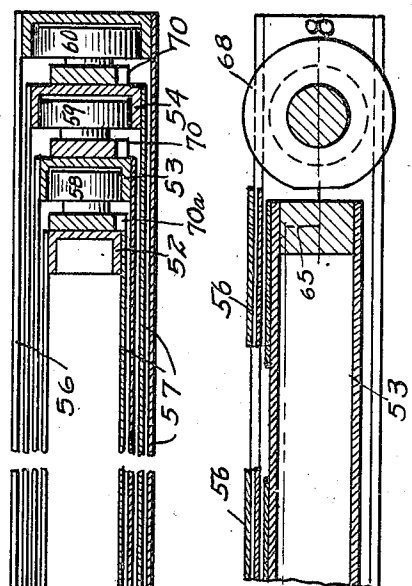


FIG. 9

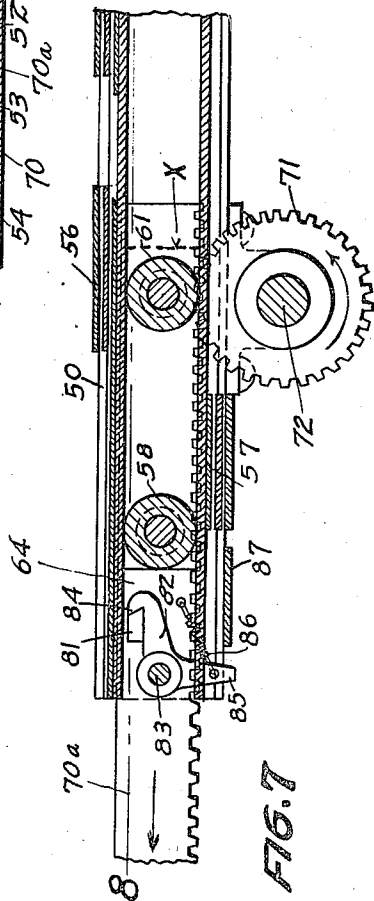


FIG. 7

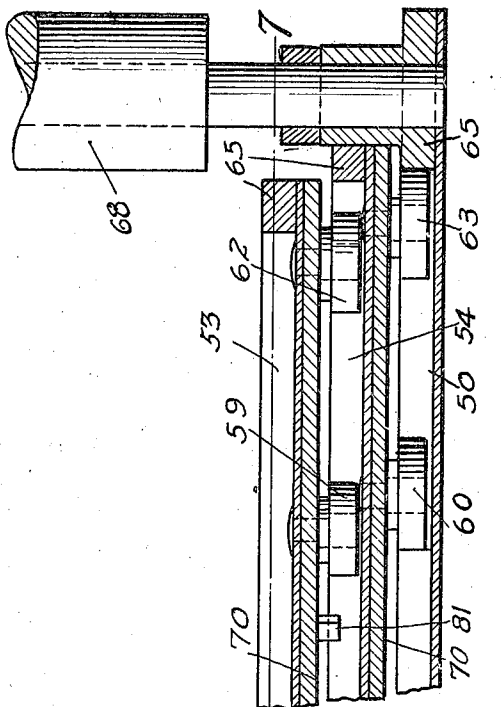
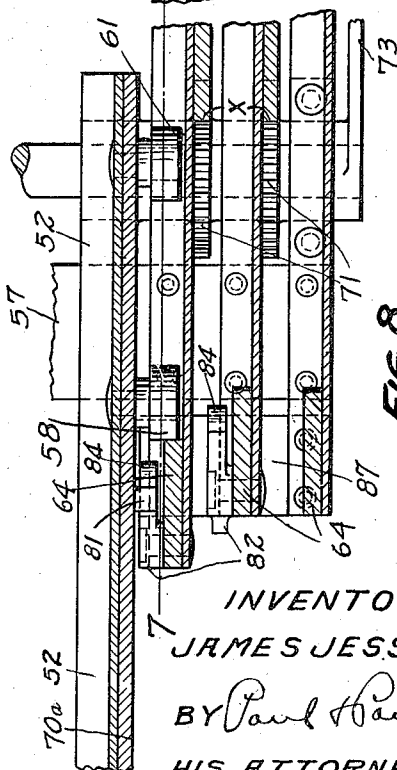


FIG. 8



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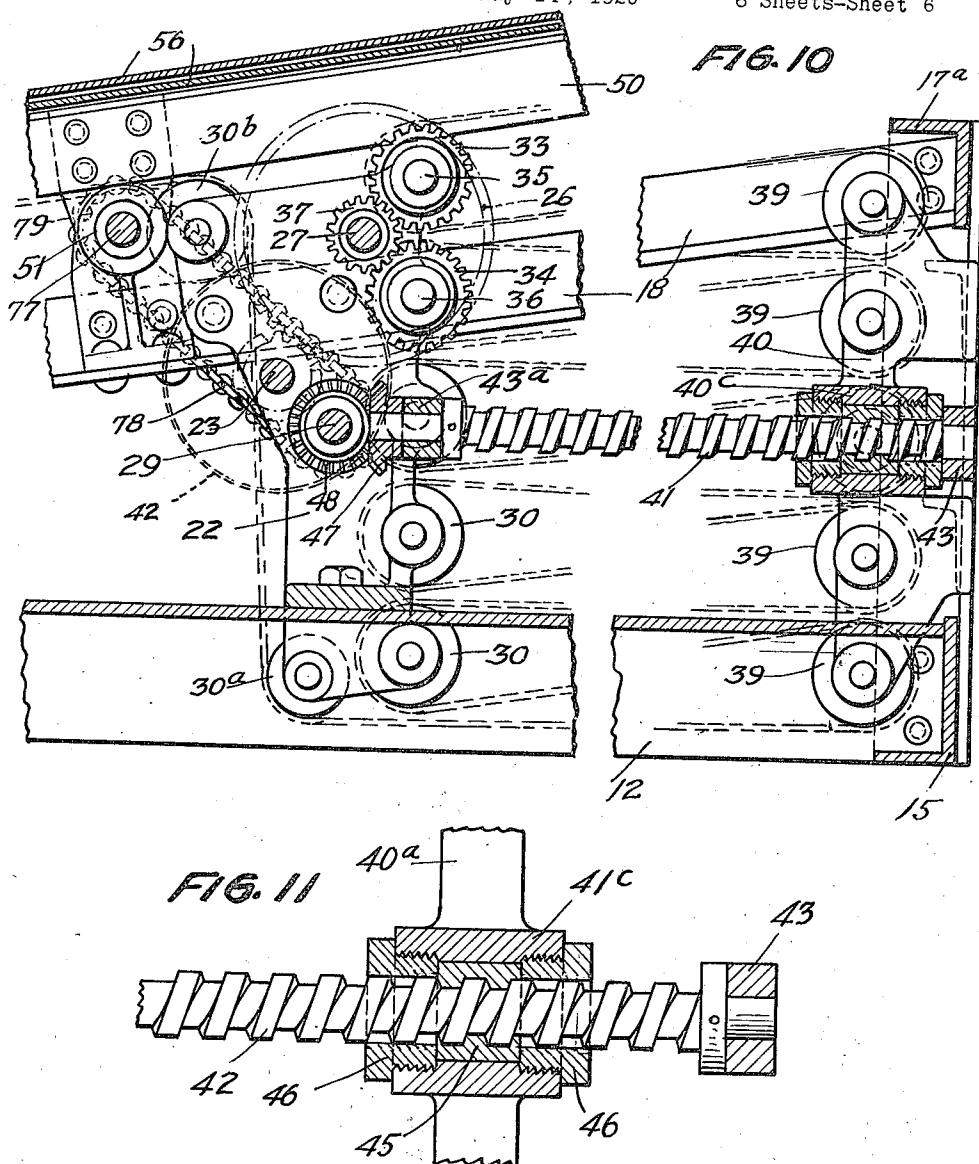
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PORTABLE EXTENSIBLE CONVEYER

Filed May 14, 1920

6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE.

JAMES JESSEN, OF MINNEAPOLIS, MINNESOTA.

PORTABLE EXTENSIBLE CONVEYER.

Application filed May 14, 1920. Serial No. 381,410.

To all whom it may concern:

Be it known that I, JAMES JESSEN, a citizen of the United States, resident of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Portable Extensible Conveyers, of which the following is a specification.

My invention relates especially to conveyers for loading railroad box cars with filled bags or packages, boxes, crates or any similar articles and also for loading grain, coal or other loose material. In loading railroad or similar box cars and especially when employing elevators or power conveyers to deliver the loading material to the car, a great deal of labor is required to move the material or goods from the centrally located entrance of the car to both ends of the car and that as the loading proceeds to the center of the car much of the labor so employed becomes superfluous and idle till the car is completely loaded and the loading of a fresh car begun. This naturally results in a great deal of labor waste, inefficiency and expense and the object of my invention is therefore to provide a motor driven portable and compact conveyer that may be placed inside the door of a car and readily extended to carry the articles or material to the ends of the car and as the loading is progressing may be as readily and quickly contracted towards the center of the car. A particular object of the invention is to provide a conveyer of the above description that is capable of conveying large and heavy packages of flour, grain and the like as well as small light articles and that will be light of weight, compact and simple of construction and may be easily handled by one or two men. Other objects will appear from the following detailed description in connection with the accompanying drawings.

My invention consists generally in various constructions and combinations, all as hereinafter set forth and particularly pointed out in the claims.

In the drawings, Figure 1 is a longitudinal vertical section of a conveying apparatus constructed according to my invention and showing the machine in a contracted form.

Figure 2 is a vertical transverse section on the line 2—2 of Figure 1.

Figure 3 is a similar section on the line 3—3 of Figure 1.

Figure 4 is a plan view partly in section on the line 4—4 of Figure 5.

Figure 5 is a longitudinal section on the line 5—5 of Figure 4.

Figure 6 is a side elevation of the conveyer showing it in a partly extended form on a smaller scale.

Figure 7 is a detail section on the line 7—7 of Figure 8 illustrating the method of extending the conveyer.

Figure 8 is a section on the line 8—8 of Figure 7.

Figure 9 is a cross-section on the line 9—9 of Figure 1.

Figure 10 is a sectional view on the line 10—10 of Figure 3.

Figures 11 and 11^a are detail views.

Referring to Figures 1, 2 and 3 in the drawings 12 represents the lower side frame members of the apparatus carrying the castor wheels 13 in swiveled ball bearing brackets 14, and 15 the lower end cross members of a frame which is preferably constructed in box form of angle bars. 16 and 16^a are the vertical corner members or posts connected by upper cross girders 17 and 17^a. The corner posts 16 are preferably somewhat shorter than the posts 16^a and inclined upper side bars 18 are secured to the corner posts 16 and 16^a making of the frame a rigid rectangular unit.

A motor 19 for driving the conveyer is mounted on a wooden plank 20 supported upon a cross bar 20^a and the rear cross bar 15. This motor may be either of the electric or internal combustion type and is provided with a driving pulley 21. Frame brackets 22 and 22^a (see also Figure 10) are rigidly secured to the upper and lower side members of the frame and a main driving shaft 23 is mounted in these brackets and is provided with a pulley 24 which is driven by a suitable belt 24^a from the motor pulley 21. The shaft 23 has a pinion 25 (see Fig. 6) meshing with a gear 26 on a secondary driving shaft 27. All of these shafts and a shaft 29 together with a tier of pulleys 30 are mounted in bearings in the frame brackets 22 and 22^a. The upper two pulleys 31 and 32 are driven from the shaft 27 by means of gears 33 and 34 mounted on the pulley shafts 35 and 36 and meshing with a gear 37 on the shaft 27 (see Figure 10).

Another tier of pulleys 39 are journaled in horizontally movable or traveling frame

members 40 and 40^a, supported on worm shafts 41 and 42. These shafts are mounted in bearings 43 and 44 on the corner posts 16^a and bearings 43^a and 44^a on the frame brackets 22 and 22^a. The frame members 40 and 40^a are rigidly connected by cross bars 40^b and 41^b (see Figure 1) and are provided with housings 40^c and 41^c in which are arranged internally threaded nuts 45 held in place by threaded caps 46 and engaging the threads of the worm shafts 41 and 42 (see Figures 10 and 11). Bevel gears 47 and 47^a on the worm shafts 41 and 42 mesh with bevel gears 48 and 48^a on the shaft 29, by means of which the worm shafts 41 and 42 will be revolved simultaneously to move the pulley frames 40 and 40^a.

The extensible conveyer consists of the tiltable frame section composed of channel-bars 50 and 50^a pivoted at 51 to the frame brackets 22 and 22^a (see Figures 1 and 10) and forming the supporting frame for a series of telescoping frame sections 52, 53 and 54, the inner one 52 carrying a head pulley 55. Each of these frame sections is composed of two channel bars firmly secured together by upper sheet steel strips or plates 56 and lower plates 57. The channel bars are of increasing height from the inner bars 52 to the outer main bars 50 and 50^a, and the connecting strips overlap accordingly, forming a telescoping frame rectangular in cross section as shown particularly in Figure 9. The frames are supported on each other and caused to telescope freely by means of the outer rollers 58, 59 and 60 and inner rollers 61, 62 and 63 secured to the smaller inward channel bars and fitting to run freely in the channels of the larger outward channel bars, with the upper and lower frame plates 56 and 57 not contacting each other as shown plainly in Figure 9.

Stop lugs 64 are fastened to the channel bars at their forward ends with which the rollers 58, 59 and 60 contact when the frame sections are extended and stop lugs 65 are secured at the rear channel ends against which the rollers 61, 62 and 63 stop when the frame sections are entirely telescoped.

Referring now again to Figure 1, the upper pulleys 31 and 32 constitute the drivers for the conveyer belt 66 and this belt runs from the upper pulley 31 around the upper pulley 39^a of the tier of pulleys 39 on the traveling or compensating pulley frames 40 and 40^a, thence around the second driving pulley 32, thence forth and back between and around the remaining traveling pulleys 39 and fixed pulleys 30 thence under an idler pulley 30^a upwards over another idler pulley 30^b and around a head pulley 68 mounted on the supporting frame sections, over the telescopic frame sections and around the pulley 55 back to the driving pulley 31. When the conveyer frame is closely tele-

scoped as shown in Figure 1, the compensating or traveling pulley frames 40 and 40^a are in the forward position on the worm shafts 41 and 42 as in Figure 1 and the channel rollers 61, 62 and 63 are bearing against the stop lugs 65 as in Figure 4, the conveyer belt 66 being under running tension. As the conveyer frame is extended the worm shafts 41 and 42 are revolved to move the compensating pulley frames 40 and 40^a a proportionate distance to keep the belt 66 under tension as indicated in Figure 6. The distance the pulleys 39 must travel to compensate for the travel of the outer conveyer pulley 55 depends on the number of pulleys 30 and 39, but as shown with a ratio of five compensating pulleys to one conveyer pulley, a distance of one fifth will be traversed by the traveling pulleys relative to the distance traveled by the outer conveyer pulley 55. It is practical to move the telescopic conveyer frame sections by hand independent of the travel of the compensating pulley frames and suitable stop locks 67 may be provided to lock the frame sections in any desired position against the tension of the belt 66 as shown in Figure 11^a, but I prefer to provide means for simultaneously telescoping the conveyer frame sections and moving the pulley frames 40 and 40^a an exact proportional space to constantly keep the conveyer belt 66 at the proper tension and at the same time lock both the conveyer frames and pulley frame sections at any desired point during the loading of the car.

To this end toothed racks 70 (see Figures 2, 5 and 7 to 9) are fastened to the channel bars 52, 53 and 54, and a series of gears 71 meshing with the racks 70 are mounted on an adjusting shaft 72 which has bearings in the supporting conveyer channel bars 50 and 50^a and is provided with an operating handle 73 and a sprocket wheel 74. A chain 75 runs from this sprocket wheel 74 to a sprocket wheel 76 on a shaft 77 concentric to the supporting pivot point of the conveyer frame and a second chain 78 (see Figures 1 and 6) runs from a sprocket wheel 79 on the shaft 77 to a sprocket wheel 80 on the shaft 29. This shaft as above described operates the worm shafts 41 and 42 by means of the bevel gears 48; 48^a, 47 and 47^a and when therefore the adjusting shaft 72 is turned to move the telescoping conveyer frame sections, the worm shafts 41 and 42 will be revolved at the same time. It is evident that the inner frame section carrying the conveyer pulley 66 must be moved the entire adjustable distance of the conveyer, which is much longer than the length of this frame and that therefore a shifting interlocking device must be interposed between the several frame sections:

In extending the conveyer frame from the telescoped position shown in Figure 1, the

shaft 72 is revolved in the direction of the arrow in Figure 7 and the inner channel frame section carrying the belt 66 is then first moved outwards, its rack 70^a being in mesh with one of the gears 71, while the racks 70 of the intermediate frame sections 53 and 54 are made short and are out of mesh with the gears 71 as indicated at X in Figures 7 and 8.

When the rollers 58 of the inner frame section 52 strike the stop lug 64 of the frame section 53, this section is carried forward by the roller until its rack 70 engages the gear 71 as shown in Figures 7 and 8 which will then move it. Lugs 81 are secured to the rack bars 70 and 70^a; said lugs projecting laterally outwards in the path of dogs 82 pivoted to the stop lugs 64 at 83 of the intermediate frame sections 53 and 54 and provided with a catch 84 and a depending arm 85. A spring 86 tends to keep this arm against the edge of a stationary plate 87 which is fastened to the supporting channel bar 50, and normally depresses the catch 84 out of the path of the lugs 81. (See Fig. 5). After the first outward movement of the frame section 53 induced by the roller 58 of the frame section 52, the dog 82 actuated by the spring 86 assumes the position shown in Figure 7, the catch 84 engaging the lug 81 and interlocking the two frame sections. As the shaft 72 continues to revolve the rack 70^a of the inner conveyer frame section 52 is disengaged from the gear 71, but the frame section is carried forward by the dog 82 and lug 81. As the second frame section 53 is extended carrying the inner frame section 52 with it until its roller 59 strikes the stop lug 64 of the third frame section 54, the same operation is repeated for interlocking the frame sections 53 and 54 and shifting the gear and rack connection from the frame section 53 to the frame section 54. When this latter frame section is also extended, carrying both the frame sections 52 and 53 with it to the limit of extension, and while the gear 71 is in mesh with the rack 70, the roller 60 strikes the stop lugs 64 of the outer supporting channel bars 50 and 50^a, preventing further extension.

The compensating pulley frames 40 and 40^a have meanwhile traveled a proportionate distance towards the fixed pulleys 30 by the co-operation of the transmission device heretofore described, the ratio of the gearing and thread pitch of the worm shafts 41 and 42 being adjusted to the exact ratio for the proportionate movement of the conveyer pulley 55 and traveling pulleys 39 to keep the belt 66 at the proper tension. In practice the conveyer may be extended or contracted to any desired point to facilitate the work by turning the handle 73 and a locking bolt 86, adapted to enter holes 87^a in the supporting conveyer frame section, (see Figure 6) may

be provided in the handle of the adjusting lever 73 for keeping the conveyer frame sections in place against the tension of the belt 66. When the frame sections are contracted or telescoped by turning the adjusting lever in the opposite direction from the arrow in Figure 7 and, the depending arm 85 of the dog 83 strikes the stationary plate 87, the catch 85 is released from the lug 81 as shown in Figure 5 and when shortly thereafter the rack bar 70 disengages from the gear 71, the inner frame section carrying the lug 81 is free to continue the telescoping movement, its rack 70^a having meanwhile come in mesh with the gear 71. In practical operation the conveyer in contracted form as shown in Figure 1 is rolled through the door of a car from a platform by means of the handles 90 and placed in the center of the car. The lower end of the conveyer is then fixed to the floor of the car by turning a threaded rod 91 mounted in supporting brackets 92 and 92^a and provided with a serrated swiveled foot 93 and thereby raising the lower end of the conveyer from the floor to the desired height. The telescopic conveyer frame is then extended towards one end of the car by turning the adjusting handle 73, the extended portion of the conveyer frame being supported upon the adjustable roller legs 94 as shown in Figure 6. The bags or other packages 95 are discharged from an inclined chute indicated in dotted lines 96 into the lower end of the conveyer. The conveyer belt 66, running in the direction of the arrows in Figure 6, carries the bags to the outer end of the conveyer, preferably discharging them on the shelf 97 from whence they are taken by one or two men and placed in tiers in the car. The shelf 97 receiving the bags from the conveyer belt is preferably inwardly inclined and supported from the inner frame section 52 by arms 97^a pivotally connected to said section at 97^b and braced by links 97^c detachably connected to the roller legs 94 in any suitable manner. The shelf 97 may thus be swung on top of the conveyer frame out of the way when the conveyer is moved before or after loading. As the loading is proceeding the conveyer is telescoped or contracted accordingly from time to time by one of the operators and when one end of the car has been loaded to the door, the conveyer has been contracted to the closed form in Figure 1, when the loading is temporarily suspended, the conveyer is lowered to the floor by operating the threaded rod 91 backwards and the conveyer is swung around to load the other end of the car.

Various modifications may manifestly be made in the construction of the apparatus without departing from the principle and scope of the invention. For example the stationary pulleys 30 may be made to travel

instead of the pulleys 39 or both series of pulleys 30 and 39 may be made to move in opposite directions when the conveyer frame is adjusted and various other details of construction modified to suit varying conditions.

I claim as my invention:

1. An extensible and contractible conveyer comprising a main frame, a telescoping conveyer frame mounted on said main frame, an endless belt operating over said conveyer frame, movable pulleys, over which said belt travels, mounted on said main frame, said pulleys moving a linear distance inversely proportional to the number of moving pulleys and the distance said conveyer frame travels when telescoped to maintain an even tension of said belt.

2. An extensible and contractible conveyer comprising a main frame, a telescoping conveyer frame mounted on said main frame, an endless belt operating over said conveyer frame, pulleys over which said belt travels mounted on said main frame, some of said pulleys being driven and means for moving said pulleys a shorter linear distance than said conveyer frame, said distance being inversely proportional to the number of moving pulleys for maintaining an even tension of said endless belt when the said conveyer frame is telescoped.

3. An extensible and contractible conveyer comprising a main frame, a series of telescoping conveyer frame sections mounted upon said main frame, an endless belt traveling over said conveyer frame section, means for telescoping said frame sections one within the other successively to vary the length of said belt, movable pulleys mounted in said main frame over which said belt also travels and means for moving said pulleys to take up and maintain an even tension of said belt when the said conveyer frame sections are telescoped.

4. In an extensible conveyer the combination with a telescoping conveyer frame and a portable main frame upon which said conveyer frame is mounted, said main frame having roller units arranged in spaced relationship thereunder, of a non-rolling jack member mounted adjustably in said main frame adjacent to one of said roller units, means for vertically adjusting said jack member with respect to said main frame and tilting said frame upon the opposite roller unit thereby transferring support of said frame from the first named roller units to said jack member, adjusting said conveyer vertically and preventing rolling movement of said frame.

5. In an extensible and contractible conveyer, the combination with a main supporting frame, of a supporting conveyer frame section pivotally connected to said main supporting frame, a plurality of telescoping frame sections adjustably connected

to said supporting conveyer frame section, a driving pulley mounted in said main supporting frame, head pulleys mounted at the rear end of said supporting conveyer frame section and the forward end of one of said telescoping conveyer frame sections, tiers of pulleys spaced apart and mounted upon said main supporting frame, an endless carrying belt passing around said driving pulley, said head pulleys and backwards and forwards around said tier pulleys and cooperating means for proportionately and simultaneously adjusting the space between said tiers of pulleys to preserve a substantially even tension of the belt when the conveyer frame sections are adjusted.

6. In an extensible conveyer the combination with a main supporting frame and driving pulleys mounted thereon, of a series of frame sections mounted upon said main frame to form a single extensible conveyer frame, a head pulley on each extremity of said conveyer frame, an endless carrying belt traveling over said conveyer frame, said head pulleys and said driving pulleys and take up means on said main frame including traveling and fixed pulleys for maintaining an even tension on said carrying belt when said conveyer frame is extended.

7. In an extensible and contractible conveyer, the combination with a main supporting frame and a supporting conveyer frame section connected thereto, of a plurality of telescoping conveyer frame sections adjustably connected to said supporting conveyer frame section, a driving pulley and a motor mounted in said main supporting frame, means for driving said pulley by said motor, head pulleys mounted at the ends of said supporting and said telescoping conveyer frame sections, a fixed tier of pulleys rotatably mounted upon said main supporting frame, a compensating tier of pulleys arranged movably upon said main frame, an endless carrying belt passing around said driving pulley, said head pulleys, and said fixed and movable tier pulleys and means cooperating with said compensating tier pulleys, and said telescoping conveyer frame sections for automatically moving said frame sections for automatically moving said compensating tier pulleys to preserve a substantially even tension of said carrying belt when said conveyer frame sections are adjusted.

8. An extensible and contractible conveyer frame, comprising an outer supporting rectangular frame section carrying a pulley and an intermediate frame section, telescoping in said supporting frame section, an inner frame section also carrying a pulley and telescoping in said intermediate frame section, roller supports connected to said inner frame section and a receiving shelf, pivoted to said frame section,

9. In an extensible and contractible conveyer the combination of a series of telescoping conveyer frame sections, stops on said frame sections to limit the telescoping movement of said frame sections, an endless belt traveling over said conveyer frame sections, a main frame on which said conveyer frame sections are mounted, pulleys on said main frame over which said endless belt travels and means cooperating with said pulleys to maintain an even tension of said belt when said conveyer frames are telescoped. 50

10. In an extensible and contractible conveyer the combination with a main frame of a series of telescoping conveyer frame sections, stops on said frame sections to limit the telescoping movement of said frame sections, toothed racks on said frame sections, a shaft mounted on one of said conveyer frame sections, gears on said shaft meshing with said toothed racks, an endless carrying belt traveling over said conveyer frame and means mounted on said main frame operating to maintain an even tension of said belt when said conveyer frame sections are telescoped. 55

11. An extensible and contractible conveyer frame comprising an outer supporting channel bar frame section carrying a rearward pulley and a forward stop, an intermediate channel bar frame section, carrying rearward rollers projecting into the channels of said supporting conveyer frame section and being provided with a forward stop and a latch dog, an inner frame section carrying a forward pulley, rearward rollers projecting into the channels of said intermediate frame section and a lug for engaging said latch dog, means cooperating with said lug and said latch dog for automatically locking said inner and intermediate frame sections together when said frame sections are extended. 60

12. In an extensible and contractible conveyer the combination with an outer support-

ing conveyer frame section, of an inner and an intermediate conveyer frame section, telescopingly connected to said supporting conveyer frame section, toothed means for telescopingly adjusting said inner and intermediate conveyer frame sections and means for automatically locking together and unlocking said inner and intermediate frame sections when said sections are adjusted. 55

13. In an extensible and contractible conveyer, the combination with an outer supporting conveyer frame section, of an intermediate and inner conveyer frame section, connected to said supporting conveyer frame section and telescopingly adjustable thereto, toothed racks arranged on said inner and intermediate conveyer frame sections, a shaft journaled on said outer supporting conveyer frame section, gears carried by said shaft and means for automatically putting said gears in alternate mesh with said toothed racks when said inner and intermediate frame sections are adjusted. 60

14. In an extensible and contractible conveyer, the combination with a main frame and an outer supporting conveyer frame section pivotally connected to said main frame, of inner and intermediate conveyer frame sections telescopingly connected to said supporting conveyer frame section, forward and rear stops arranged in said conveyer frame sections to limit the telescoping movement of said inner and intermediate frame sections, geared means actuating to extend said conveyer frame sections and means for successively locking said inner and intermediate frame sections together, and causing said geared means to successively actuate said inner and intermediate conveyer frame sections when said conveyer frame sections are extended. 65

In witness whereof, I have hereunto set my hand this 12th day of May, 1920.

JAMES JESSEN.