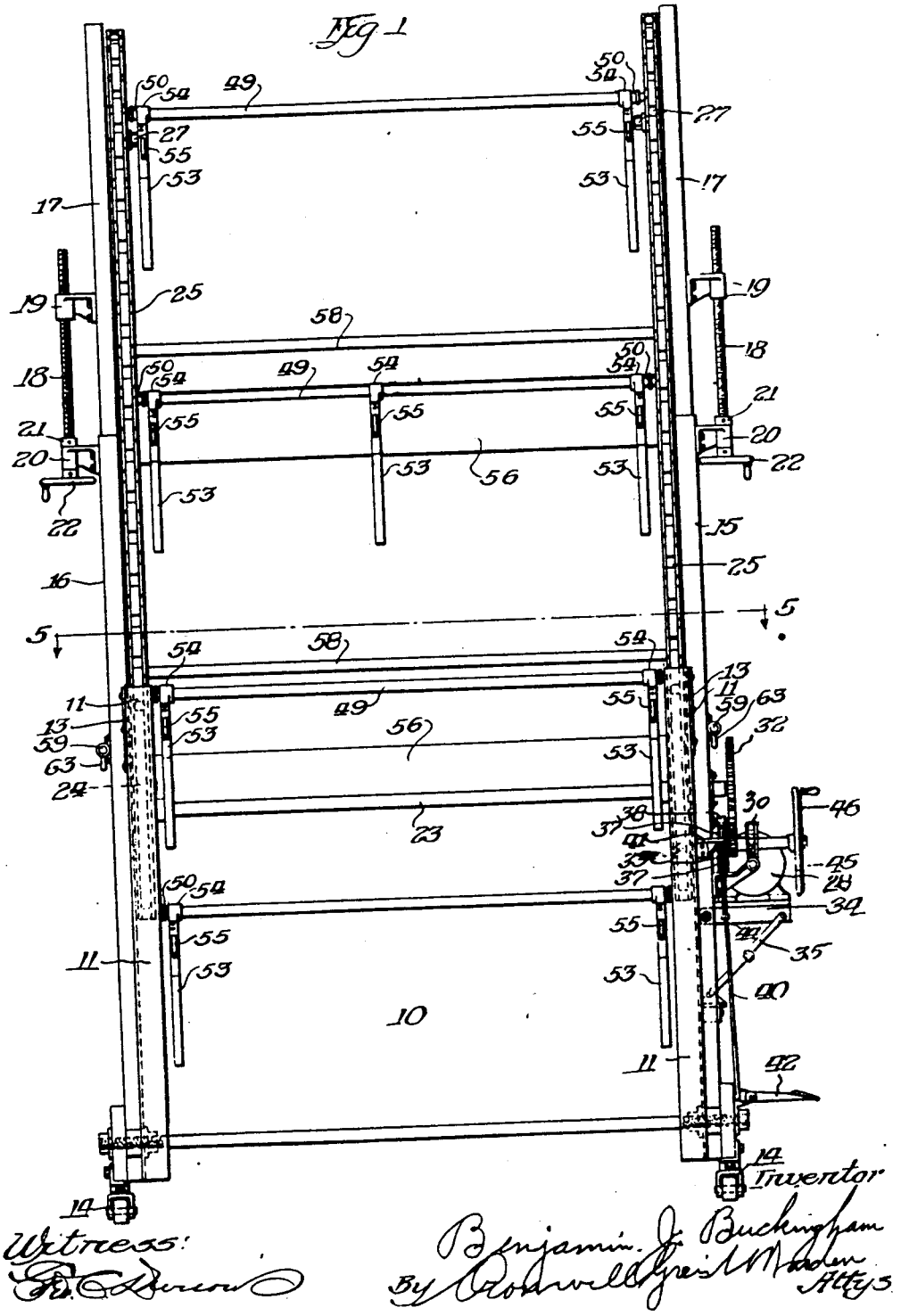
Aug. 7, 1928. 1,680,034

B. J. BUCKINGHAM

DISPLAY APPARATUS

Filed Feb. 28, 1924 4 Sheets-Sheet 1

Fig. 1



Witness:

Inventor

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By Bodwell, Greist & Madden

Attys.

Aug. 7, 1928. 1,680,034

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DISPLAY APPARATUS

Filed Feb. 28, 1924 4 Sheets-Sheet 2

Fig. 2.

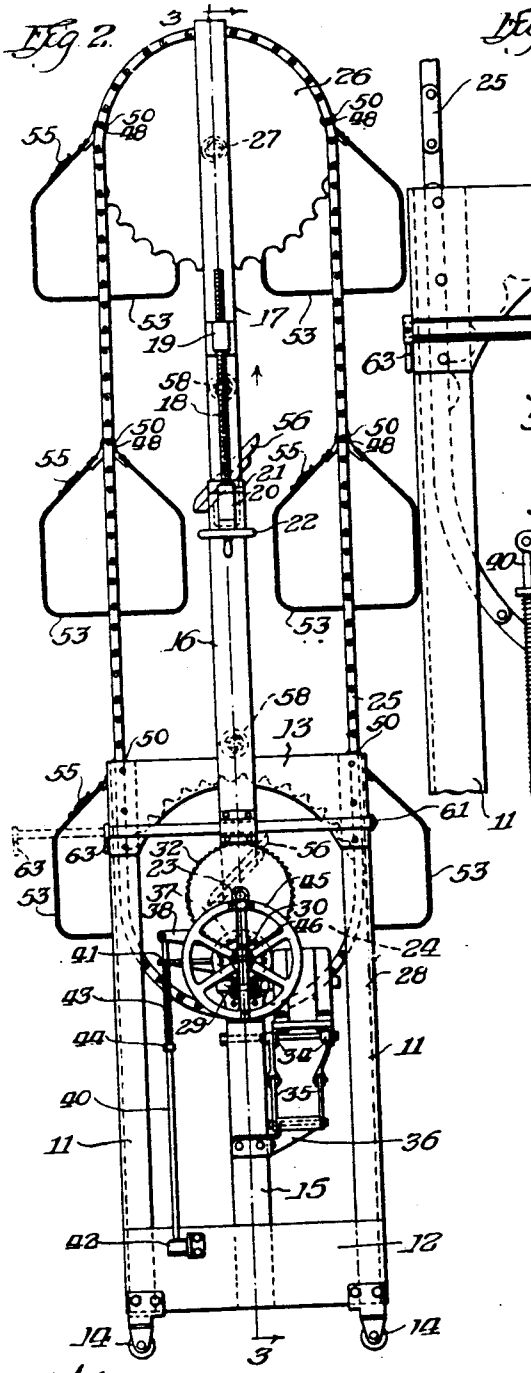
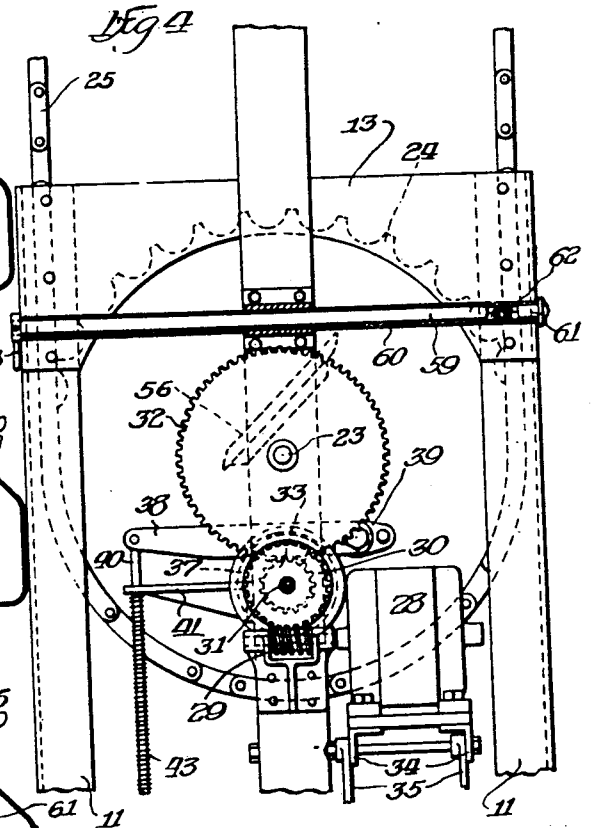


Fig. 4



Witness:

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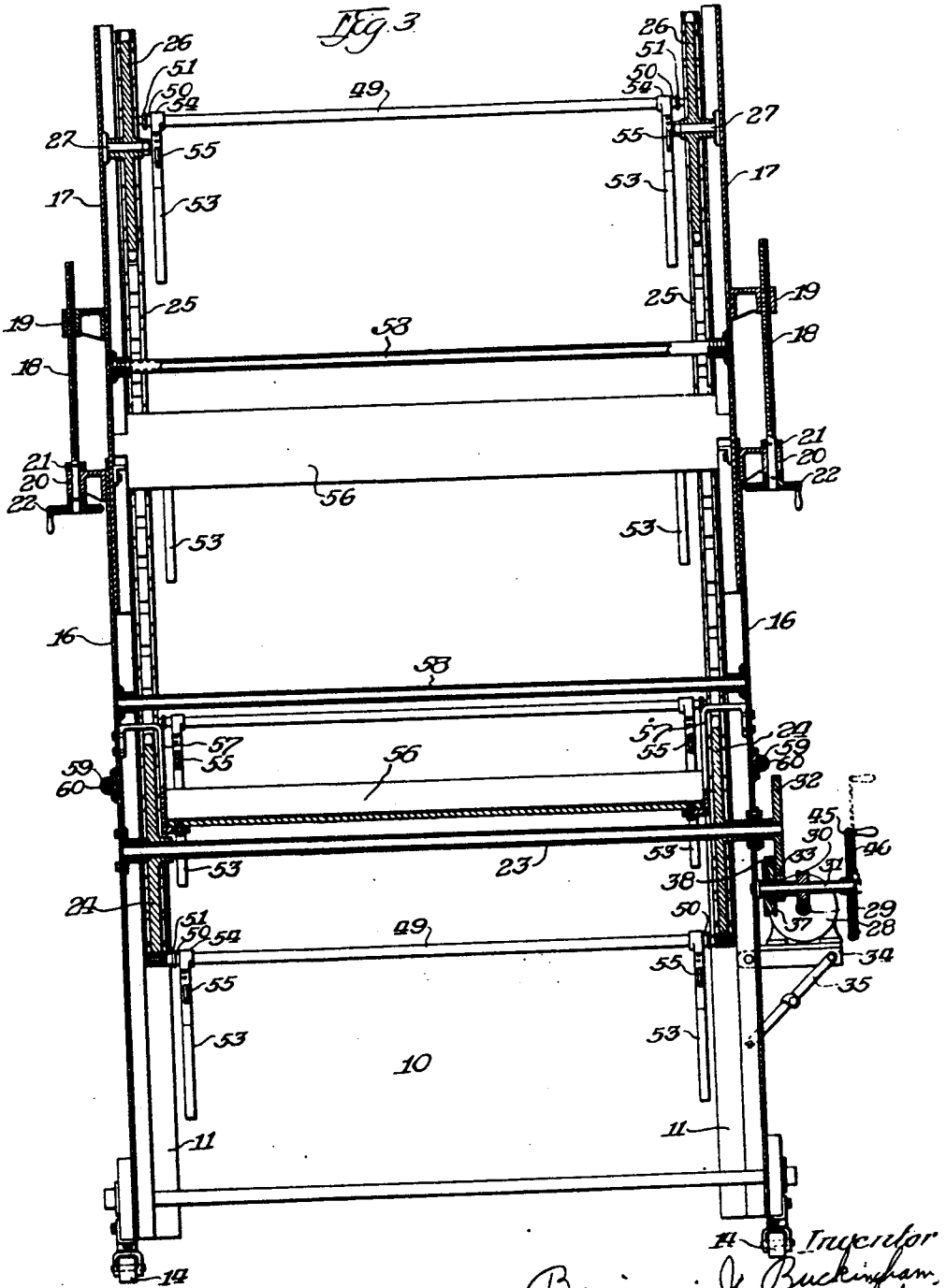
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DISPLAY APPARATUS

Filed Feb. 28, 1924 4 Sheets-Sheet 3

Fig. 3



Witness:

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DISPLAY APPARATUS

Filed Feb. 28, 1924 4 Sheets-Sheet 4

Fig. 5

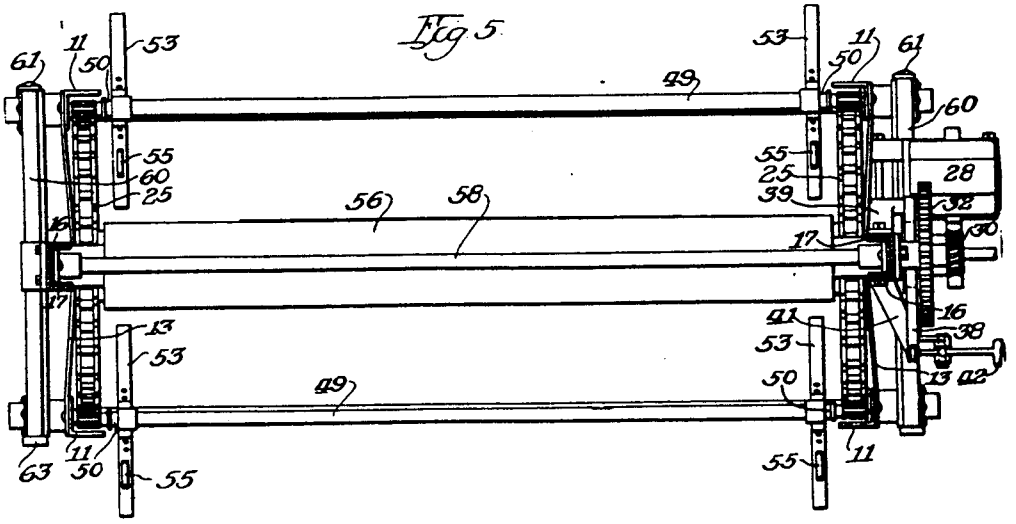
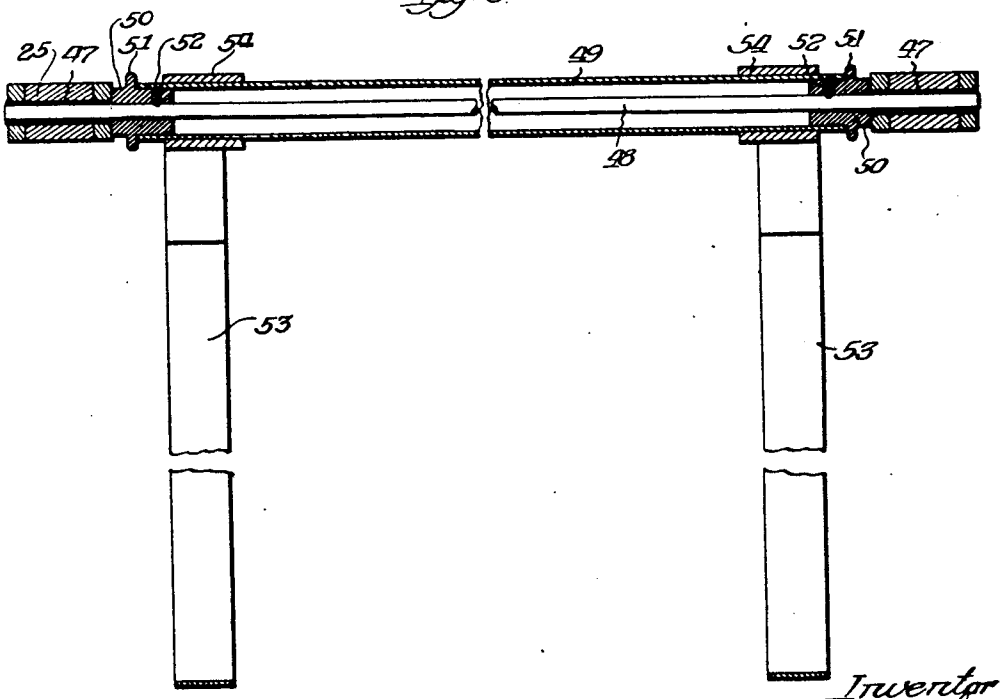


Fig. 6



Witness:

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Patented Aug. 7, 1928. 1,680,034

UNITED STATES PATENT OFFICE.

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DISPLAY APPARATUS.

Application filed February 28, 1924. Serial No. 695,648.

The primary object of the present invention is the provision of a display apparatus for the exhibition of articles of merchandise while such articles are travelling through a predetermined path. The articles, therefore, may be displayed in regular succession to the observer, and in convenient access for removal from the apparatus when such is desired.

More specifically, the invention contemplates an apparatus of the character mentioned designed for the combined storage and display of clothing, its construction being such as to economize in the space required for storage, thereby enabling a maximum number of garments to be stored in a minimum area, and permitting the garments successively to be displayed while so stored. The economy of storage space thus obtained is effective to eliminate to a large extent the shelving and display cases heretofore used for such purposes, and enables the proprietor of a store to reduce the floor space necessary for such shelving and cases.

Furthermore, the invention has in view the production of a display apparatus wherein provision is made to insure proper travel of the garments through the machine without liability to injury of the garments or entanglement thereof with the moving parts of the machine.

The invention also aims to provide a display apparatus such as referred to wherein the operative parts are so related as to afford a most compact organization, thereby saving in the material for the construction of the apparatus, and rendering the parts of the latter readily accessible for repair or replacement when damaged or worn.

To the accomplishment of the foregoing, and other objects which will appear as the nature of the improvements is better understood, the invention consists substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and finally pointed out in the appended claims.

The embodiment of the invention herein disclosed is believed to be fully illustrative of the same, and incorporates a practical adaptation of the invention for the uses and purposes for which the same is intended. However, it is to be taken in an illustrative sense, and therefore is not to be considered as restricting the invention to that form which is herein delineated.

In the drawings,

Fig. 1 is a front elevation of a display apparatus constructed in accordance with the present invention;

Fig. 2 is an end elevation thereof;

Fig. 3 is a vertical transverse sectional view on the line 3—3 Fig. 2;

Fig. 4 is a detail elevation, on an enlarged scale, of the driving mechanism;

Fig. 5 is a sectional plan view on the line 5—5, Fig. 1;

Fig. 6 is a detail sectional view, also on an enlarged scale, of one of the supporting members and the guards carried thereby.

Referring now in detail to the accompanying drawings, it will be observed that the apparatus includes a substantially rectangular base frame 10 which is made up of corner supporting posts 11, preferably formed of angle iron. The lower ends of the posts 11 at the sides of the frame 10 are connected by tie plates 12, and their upper ends are likewise connected by similar plates 13. The plates 12 and 13 are designed to prevent spreading of the corner posts 11, and thereby impart to the same a fixed relation without the necessity of resorting to material of heavy gauge for such purpose. The base frame 10 thus is relatively light in weight, and in such embodiment of the machine as may adapt it for portability, whereby to enable the machine to be moved to different positions in a store room or other place of display, the frame 10 may be provided with casters 14 or the like to permit easy movement of the machine over the floor.

Extending upwardly from each side of the frame 10 is a supporting standard 15 positioned midway of the ends of the plates 13, each of said standards 15 including two interfitting telescopic members 16 and 17. These members preferably are formed of channel iron to attain the interfitting relation referred to, the upper member 17 of each standard being relatively adjustable to the lower member 16 by elongated adjusting screws 18, the upper ends of which are threadably engaged with connecting brackets 19 carried by the upper members 17. The screws 18 are loosely received at their lower ends by connecting brackets 20, and each screw is provided with a collar 21 by which the screw is held in proper operative rela-

tion in the bracket 20 with which it is associated. The rotation of the screws 18 is effected by hand wheels or cranks 22, and when suitably operated relative movement is effected between the members 17 and 16 of the standards 15.

Suitably journalled in the lower member 16 of the standards 15 is a transversely extending shaft 23, and connected to each end of the shaft 23 within the base frame 10 so as to rotate with the shaft is a sprocket wheel 24 over which is trained a sprocket chain 25. The diameter of the sprocket wheels 24 is relatively large so as to get the greatest width between the stretches of the chains 25 which engage these wheels, and thereby provide the maximum space between such stretches to accommodate the merchandise which is stored and displayed by the apparatus. These chains 25 are also trained over sprocket wheels 26, one of which is arranged at the upper end of each member 17 of the standards 15, and rotatably mounted in relation thereto by an inwardly extending trunnion or spindle 27. By the use of the trunnions or spindles 27 clearance is had between the wheels 26, and free passage of the articles is obtained as they move from one side of the apparatus to the other in the movement of the chains 25.

The driving mechanism of the herein described apparatus includes an electric motor 28 to the armature shaft of which is connected a worm 29 which meshes with a worm gear 30 carried by a shaft 31. Between the shaft 31 and the shaft 23 is a train of gears including a spur gear 32 and a pinion 33. The shaft 31 is suitably journalled to the lower member 16 of one of the standards 15, the shaft 23 having one of its ends extended sufficiently beyond the end of the frame 10 to position the spur gear 32 at the exterior of that frame and for convenient meshing with the pinion 33 which is also at the exterior of the frame.

The motor 28 is mounted on a supporting table 34, which is also at the exterior of the frame 10 and properly sustained in position by an inclined strut 35 connected at its upper end to the table 34 and at its lower end to an arm 36.

For energizing the motor 28 any suitable switch mechanism for controlling the flow of current thereto may be employed. Preferably, such switch mechanism is so related to the motor as to control flow of the current thereto when the braking mechanism, about to be described, is released, and by which that flow is caused to cease when the braking mechanism is applied to the motor. This enables operation of the display apparatus to be started expeditiously likewise expeditiously stopped when it is desired to bring the apparatus to rest. This braking mechanism includes a brake wheel or drum 37 which is mounted on the shaft 31 adjacent to the pinion 33 and with which a brake lever 38 co-operates. The lever 38 is pivotally connected to an arm 39 at one of its ends, its other end being connected to a depending link 40 which passes through a perforated arm 41 connected to the adjacent standard 15. The lower end of the link 40 is connected to the inner end of a pivoted foot lever 42 mounted at the lower portion of the base frame 10, said lever being pivoted between its ends, so that on downward pressure being applied to the outer end of said lever 42 the link 40 is moved upwardly, with corresponding upward movement of the brake lever 38, resulting in release of that lever from its engagement with the brake wheel 37. The lever 38, however, normally is held in frictional engagement with the brake wheel 37 by a coil spring 43 which encircles the link 40, said spring being interposed between the arm 41 and an adjustable collar 44 which is carried by the link 40. The adjustment of the collar 44 will permit varying degrees of compression of the spring 43, thereby permitting varying degrees of frictional contact of the brake lever 38 with the brake wheel 37.

By referring to Fig. 1, it will be noted that the shaft 31 is of sufficient length that its outer end projects beyond the worm gear 30, said projecting end having mounted thereon a hand wheel 45 provided with an extensible crank 46, thus enabling the apparatus to be operated by hand when such may be desired.

The construction of the chains 25 is that now commonly used in chain and sprocket gearing, the same including the usual alternating male and female links, these links being connected by bushings or sleeves 47, as illustrated in Fig. 6. Advantage is taken of this construction to provide a novel form of supporting means by which the merchandise to be stored and exhibited may be conveniently applied to the chains. It will be observed from Fig. 6 that within the sleeves 47 is disposed a supporting rod 48, the ends of which are co-extensive with the outer sides of the links in the two chains 25. The supporting rods 48 thus are loosely received by the sleeves 47, and may be readily introduced to and removed therefrom when such is desired, thereby permitting the number of supporting rods to be increased or decreased with respect to the length of the chains 25, and giving more or less support for the articles to be displayed by increasing or decreasing the number employed. Each rod 48 is surrounded by an elongated sleeve 49, which is relatively shorter than the rod 48, and each of these sleeves 49 has a closure plug 50 fitted in each of its ends. The plugs 50 are provided with peripheral flanges 51 against which the ends of the

sleeves 49 abut, and said plugs likewise are provided with longitudinal bores for receiving the ends of the rod 48. Set screws 52 are associated with the ends of the sleeves 49, said screws passing through the sleeves, and also the plugs 50, and impinging against the rods 48. This locks the sleeves 49 to the closure plugs 50, and also the latter to the rods 48. It will also be observed that the length of the sleeves 49 is such that the outer ends of the closure plugs 50 will serve as stops against which the links of the chains 25 will abut, so that the rods 48 are precluded sliding out of the sleeves 47 until the set screws 52 have been released, whereupon the entire structure may be readily detached from the chains 25.

It will be understood that in the display of the merchandise suitable shelving may be suspended from the sleeves 49, or the merchandise itself may be directly applied to these sleeves. It has been stated previously that in the particular embodiment of the invention herein disclosed the same is adapted for the storage and display of clothing. In this use the garments are applied to the usual hangers, and the hangers themselves suspended from the sleeves 49, thereby enabling a suit of clothes, or a lady's garment, either individually or in groups, to be suspended from these sleeves and readily detached therefrom when occasion arises therefor. In other articles of merchandise, however, such as candy and similar commodities which require to be displayed through the medium of shelving, a shelf may be suspended from each of the sleeves 49, and carried thereby in the travel of the chains 25 through the path of travel of the latter.

Where the apparatus is intended for displaying clothing provision is made to prevent damage of the clothing by its contact with the operating parts of the apparatus, or its entanglement with such parts. For this purpose each of the sleeves 49 has applied thereto one or more pendent guard loops 53. To balance these loops in their suspension from the sleeves 49 their upper ends are caused to converge, the converging portions terminating in suspension sleeves 54 which loosely receive the supporting sleeves 49. The guards 53 may be moved to any point along the sleeves 49, either towards or away from the chains 25, and as the guards occupy positions between the garments and the chains, it will be seen that the garments are precluded from contacting with the chains and the sprocket wheels during the travel of the chains.

A spring clip 55 may be attached to each of the guards 53 for applying thereto a price ticket or tag which denotes the sale price of the articles displayed, and if garments of different prices are assembled on any one of the supporting sleeves 49, those garments of one price may be separated from the garments of another price by utilizing the guards 53 as partitions between the groups of the differently priced garments.

In the operation of the apparatus there may be a tendency of the suspended articles to sway, particularly so when these articles are clothing, as the same are transferred from one side of the apparatus to the other. In such event, and to prevent the articles on one stretch of the chains interfering with movement of the articles on the other stretch of the chains inclined deflectors 56 are arranged at suitable points between the supporting standards 15. These deflectors extend across the space between the chains 25, and as the articles pass the deflectors, if there be swaying movement in the articles at such time, the same contact with the deflectors and ride over the surface thereof. In supporting the deflector 56 which is next adjacent to the shaft 23, the swaying of the articles being more particularly noticeable at this point, and it being thus essential that free movement of the articles around the shaft 23 shall be effected, the ends of that deflector are mounted in supporting brackets 57 the upper ends of which are turned outwardly in order to span the wheels 24, and the lower ends being turned inwardly in order to sustain the lowermost deflector 56 in proper relation to the wheels 24. Thus as the articles descend on one stretch of the conveyor they will contact the deflector and be moved away from the shaft 23, while on their upward movement on the other stretch of the conveyor a similar condition arises, and free movement thereby is assured.

The apparatus may be braced additionally against stresses and strains by the interposition of tie rods 58 at suitable points, the ends of said tie rods being suitably connected within the channels of the standards 15.

As a means for conveniently loading and unloading the apparatus, particularly when the same is to be used for displaying articles of wearing apparel, an extensible supporting rod 59 may be arranged at each end of the apparatus, which rod is received by a tubular housing 60 one end of which is closed by a plug 61. Between the plug 61 and the inner end of the rod 59 is connected a cable or cord 62 for limiting the outward movement of the rod 59, and the latter carries at its outer end a handle 63 for its convenient manipulation. When withdrawn from the housing 60 the articles to be loaded on to the conveyor chains may be placed on the rod from which they are transferred to the supporting sleeves 49 as the necessities of the display or storage may require.

From the foregoing description the operation of the herein described apparatus will readily appear. The braking mechanism

normally holds the chains 25 against movement, and whether one stretch of the chains balances the other, due to any differential in weight between the stretches because of a preponderance in the mechandise on one stretch over that on the other, there is no movement of the chains until the braking mechanism is released. This is done by downward pressure being applied to the foot lever 42 at which time the brake lever 38 releases its braking action on the brake wheel 37. At that time, however, current is fed into the electric motor 28, and movement of the chains 25 thus is started. The rate of travel of the chains is determined by the ratio of the gears and the movement of the motor, but preferably that ratio is such that the movement of the chains is relatively slow so that as the various supporting sleeves 49 pass by a given point full opportunity will be afforded the observer to inspect the mechandise which is displayed. If it be desired to bring the apparatus to rest, it is but necessary to release pressure on the lever 42, whereupon the spring 43 exerts itself to pull downwardly the brake lever 38 and establish its frictional engagement with the brake wheel 37, thereby stopping movement of the chains 25. When the apparatus is in operation the merchandise stored and displayed thereby passes up one stretch of the chains 25 and down the other, and this movement continues so long as the electric motor 28 is energized. The adjusting screws 18 may be operated to compensate for any slackness in the chains 25, the members 17 of the posts 15 being thus adjusted relatively to the members 16 thereof, so that the proper tension on the chains 25 may be established and maintained at all times.

The guard loops 53 insure prevention of damage to the merchandise by reason of the same coming into contact with the chains, and these loops also serve to balance the merchandise against undue swaying as the same is transferred from one side of the apparatus to the other. If the merchandise displayed be clothing, the garments are grouped, as above explained, in accordance with the price variations, so that garments of one price will pass the inspecting point at the same time. In the storage and display of the garments the same are suspended in close relation to each other along the supports 49, and as the number of supports employed in the particular apparatus may be regulated or varied, it is obvious that the capacity of the machine or apparatus may be varied to meet the particular conditions of the business in which it is used. Therefore, a greater or a less number of garments may be stored and displayed. While the embodiment of the apparatus is illustrated as of a portable character, it will be understood that the same may be built into a store or display room as a permanent fixture thereof, and the same may be extended through several stories of a building if the needs of the particular business require an apparatus of such capacity.

The operation of the apparatus continues so long as the electric motor 28 is energized and the brake lever 38 is out of frictional contact with the brake drum 37. The foot lever 42 is the medium for maintaining this relation of the parts, but it will be understood that any suitable mechanism may be adopted for locking the parts in such position as to insure continuity of operation of the apparatus for any predetermined period of time, thus avoiding the necessity of maintaining pressure on the foot lever 42 by an operator of the apparatus.

I claim:

1. In a conveyor device of the class described comprising a pair of lower sprocket wheels, a pair of upper sprocket wheels, a pair of sprocket chains trained around said wheels, means for driving said chains on said wheels, said chains being arranged to move in spaced substantially parallel-vertical planes, and means disposed in the space between said chains and carried thereby for suspending articles therefrom, a frame for supporting said wheels and the associated chains in operative relationship, said frame comprising a rectangular frame unit extending to a portion of the height of said conveyor device and having the lower sprocket wheels mounted in oppositely disposed side walls thereof, a pair of standards upwardly extending from said side walls, each standard consisting of nested channel members, and means for supporting the upper wheels from the upper ends of said standards, said nested channel members being relatively slidable to permit variation of the spacing between the upper chain wheels and the lower chain wheels.

2. A conveyor device comprising a rectangular self-supporting frame unit having a pair of vertically disposed spaced side walls and bracing means for rigidly holding said side walls in spaced relationship, a pair of sprocket wheels supported on said side walls, a pair of posts extending from the top of said side walls in the direction above the sprocket wheels, a pair of sprocket wheels mounted at the upper ends of said posts in spaced relationship to said lower sprocket wheels, a pair of endless sprocket chains trained on the corresponding lower and upper sprocket wheels, respectively, means for driving said chains, means for supporting articles between the parallel-disposed chains to be carried thereby during their movement, said posts being of telescopic construction for varying the length thereof, and means for adjusting the

length of said posts while said sprocket chains are trained on the associated sprocket wheels.

3. In a display device comprising a supporting frame and a plurality of sprockets conveying endless chains on opposite sides of the frame and providing display and storage space therebetween, a carrier structure supported at its ends by said endless chains, said carrier structure comprising a central rod member engaging the endless chains and a tubular member mounted thereon and in spaced relation thereto, pendant guard and spacing means mounted on the carrier structure and longitudinally slidable along the latter for confining articles suspended from the carrier structure to an arbitrarily determined portion of the width of the carrier.

4. In a display device comprising a supporting frame and a plurality of sprockets conveying endless chains arranged at opposite sides of the frame and providing display and storage space therebetween, a plurality of spaced article carriers supported at their ends by said chains, said carriers comprising a central rod member engaging the chains and a sleeve member supported on the rod, pendant guard loops mounted on the sleeve member and slidable to any desired position thereon, and deflecting means mounted between opposite sides of the frame and between the opposite reaches of the endless chains.

5. In an apparatus of the character described comprising a pair of endless conveyer chains, sleeves in the links of the chain, a supporting rod having its ends loosely extending in the sleeves and axially removable therefrom, collar members mounted on the rod and locked thereto adjacent the chain engaging portions to prevent removal of the rod from the chain, and a tubular member surrounding the rod and held in spaced relation thereto by engagement with the collar members.

6. In an article carrier for endless chain display conveyers, a rod member, spaced collar members mounted on the rod providing limited bearing portions at the ends of the rod, a sleeve member mounted on the collar members in spaced relation to the rod member, and pendant loops having portions slidably mounted on the sleeve member to provide longitudinal adjustment of the guard loops lengthwise of the carrier.

In witness whereof I have hereunto signed my name.

BENJAMIN J. BUCKINGHAM.