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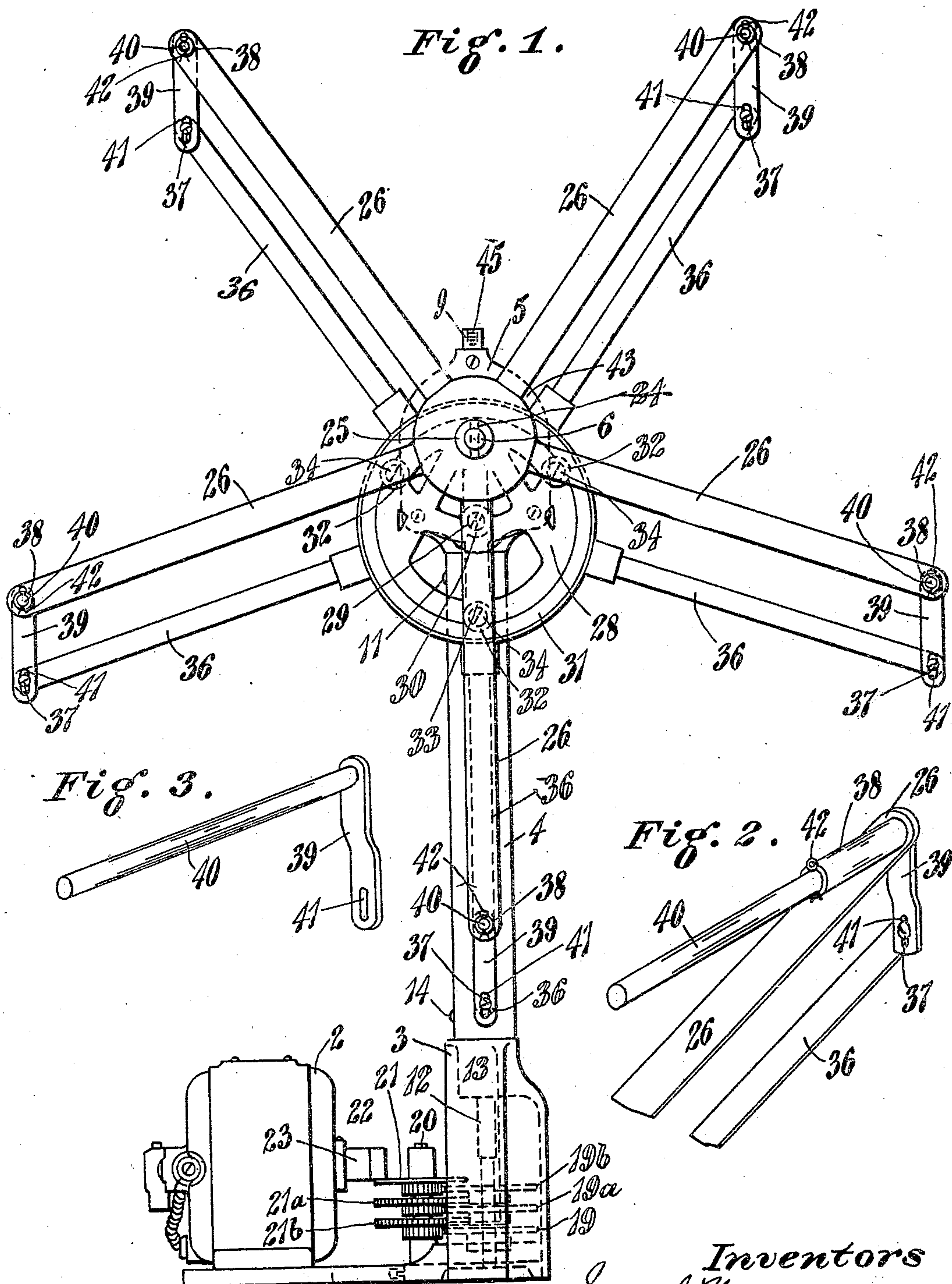
DISPLAY APPARATUS.

APPLICATION FILED MAR. 25, 1909.

Patented Dec. 28, 1909.

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944,969.



Witnesses:

Clarence Peden  
 Florence Hammel

Inventors  
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Fig. 4.

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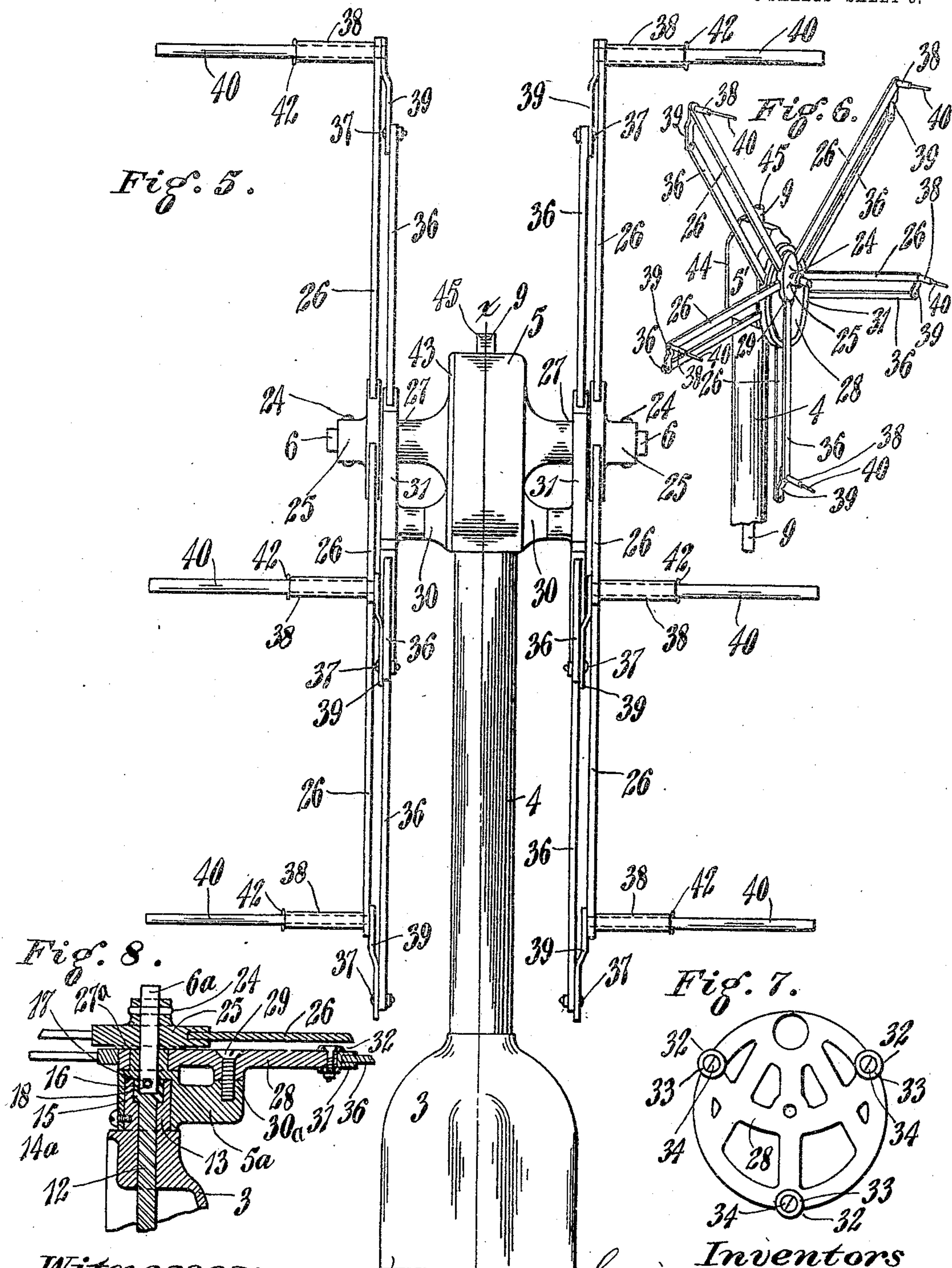
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# UNITED STATES PATENT OFFICE.

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## DISPLAY APPARATUS.

944,969.

Specification of Letters Patent.

Patented Dec. 28, 1909.

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*To all whom it may concern:*

Be it known that we, SAMUEL NEWMAN, a citizen of the United States, and HENRY R. BOTHWELL, a subject of the King of Great Britain, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Display Apparatus, of which the following is a specification.

Our invention relates to exhibitors, and the object is to provide means for successively and repeatedly presenting a series of articles of merchandise, or other articles of a similar character, for the purpose of attracting attention thereto.

Our invention consists in the combination of members rotatable with respect to each other, links pivotally connecting the members, and studs on the links, whereby said links are maintained parallel and said studs are uniformly presented to an observer throughout the rotation of the members.

Our invention also consists in the parts and in the details of construction and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawings: Figure 1 is a side elevation of a device embodying our invention. Fig. 2 is a detail perspective view, illustrating the arrangement of the arms, the link and the stud. Fig. 3 is a detail perspective view of one of the links and the stud thereon. Fig. 4 is a vertical cross section of the device, enlarged, parts being broken away for lack of space. Fig. 5 is a front elevation of the device. Fig. 6 is a perspective view of part of a device exhibiting the novel features of our invention. Fig. 7 is a detail view of the eccentric disk. Fig. 8 is a partial cross sectional view of a device embodying a modification of our invention.

As we prefer to embody our invention, the arms of the device are so mounted as to rotate in vertical planes, there being a series of main arms constituting one member, and a series of other arms constituting another member, rotating eccentrically with respect to each other, these two eccentrically rotating members being connected by links on which studs are mounted to carry the articles to be displayed. Two sets of such eccentrically rotating members are provided, mounted on a common standard which carries the rotating mechanism. The standard comprises a base 1, which has a suitable motor 2 thereon, and is provided with a housing 3 upon the upper

side of which a tubular column 4 is carried. This column 4 carries, at its upper end, a head 5, transversely journaled in which are the main shafts 6, each of which has on its inner end interiorly of the head 5, a bevel gear 7. Both of these bevel gears are in mesh with the bevel pinion 8 on a vertically extending shaft 9. This shaft 9 is journaled in a lug 10 on the lower part of the head 5, which lug fits into the upper end of the tubular column 4 and is secured therein by means of a screw 11 to hold the head in stationary position on the column. An intermediate shaft 12 is journaled vertically in the housing 3, in a lug 13. This lug 13 extends into the lower end of the tubular column 4 and is secured thereto by means of a screw 14 to hold the column in stationary position on the housing.

The intermediate shaft 12 has at its upper end an enlarged part 15 which has a central opening 16 to receive the lower end of the vertically extending shaft 9 and also has slots 17 to receive radially extending lugs 18 on said shaft 9. By means of these the shaft 9 may be made to rotate with the intermediate shaft 12 to transmit motion therefrom to the main shaft 6 journaled transversely in the head. At the same time the shaft 9, being readily detachable from the intermediate shaft 12, the column 4 may be readily removed from the housing 3, when it is desired to take the machine apart. This is of considerable advantage since the construction of the machine is necessarily such that it occupies considerable space in proportion to its weight and to the strength of its parts, requiring that the machine be taken apart for handling and transportation to avoid inconvenience and breakage.

The intermediate shaft 12 has the gear wheel 19 rigidly mounted thereon and two other gear wheels 19<sup>a</sup> and 19<sup>b</sup> loosely mounted thereon. Each of the gear wheels 19<sup>a</sup> and 19<sup>b</sup> has a pinion rotatable with it. A vertical stud 20 is mounted on the base between the intermediate shaft 12 and the motor 2 and carries loosely mounted thereon a friction wheel 21, and gear wheels 21<sup>a</sup> and 21<sup>b</sup>. The friction wheel 21 and each of the gear wheels on the stud 20 are provided with pinions to rotate with them. The pinion of the wheel 21 meshes with the gear 19<sup>b</sup>, the pinion of this gear meshes with the gear 21<sup>a</sup>, the pinion of the gear 21<sup>a</sup> meshes with the pinion of the gear 19<sup>a</sup>, the pinion of the



gear 19<sup>a</sup> meshes with the gear 21<sup>b</sup> and the pinion of the gear 21<sup>b</sup> meshes with the gear 19, which drives the intermediate shaft. The motor 2 is provided with a friction pinion 5 22 on its shaft 23 in contact with the friction wheel 21. By means of this transmission mechanism, just described, the motor, running at high speed, is made to drive the main shaft 6 in the head 5 at a slow speed and 10 with a steady motion.

Where it is desired to rotate the arms in a horizontal plane, the tubular column 4 and vertically extending shaft 9 may be dispensed with and the head 5 modified to adapt 15 it to fit directly on the lug 13 of the housing 3 and to carry only one set of arms, as is illustrated in Fig. 8 of the drawings, where the head 5<sup>a</sup> fitting onto the lug 13 of the housing 3 carries a main shaft 6<sup>a</sup> journaled 20 vertically therein, this main shaft being adapted to fit into the opening 16 in the head 15 of the intermediate shaft 12, and having a stud 18 to fit into the slot 17 therein. In either case, whether two main shafts 6 are 25 mounted in a single head 5, or whether one main shaft 6<sup>a</sup> is mounted in a head 5<sup>a</sup>, the main shaft carries, mounted thereon and made to rotate therewith by means of a pin 24, a hub 25 rigidly mounted in which are 30 main arms 26 radiating from the center of the main shaft 6 at equal intervals therearound. The head 5 is provided with lateral extensions forming bearings for the main shaft 6, and these extensions are provided 35 with necks 27 to form supports for eccentric disks 28 which have openings into which the necks 27 snugly fit. To prevent the eccentric disks from turning they have screws 29 taking through their centers into laterally 40 extending lugs 30 on the head 5. A ring 31 fits over the periphery of the disk 28 to turn thereon and is prevented from lateral displacement therefrom by means of clips 32, each comprising a washer 33 flanking the 45 ring 31 at its bearing on the disk, and flanking the disk, being secured on the disk by a screw 34 passing through the washers and the disks. Preferably, bushings 35 of suitable material are interposed between the 50 washers and the ring 31 to afford a proper bearing therewith when it turns on the disk.

The ring 31 has arms 36 rigidly mounted in it and radiating from its center at equal intervals therearound, corresponding to the 55 main arms 26 in the hub 25. Near their ends, these arms in the ring 31 are provided with openings receiving screws 37. The main arms 26, near their ends, are provided with sleeves 38 extending outwardly of the machine parallel to the axis of rotation of 60 the hub 25 and main arms 26 and to the axis of rotation of the ring 31 on which the arms 36 are mounted. Each of the arms 26 has an opening through it continuous with the 65 interior of the sleeve mounted on it. These

openings, and the sleeves with which they are continuous, are at a distance from the center of the main shaft 6, around which the main arms rotate, equal to the distance 70 of the openings 37 in the arms 36 from the center of the ring 31, in which the arms 36 are mounted, and of the disk 28 upon which the ring rotates. To connect each one of the main arms 26 with a corresponding arm 36, 75 a link 39 is provided, each of these links having an elongated stud 40 rigidly attached to it near one of its ends, which stud passes through the sleeve 38 on the main arm 26 and serves as a pivotal connection between 80 the link 39 and said arm. The other end of the link 39 is provided with an opening 41 here shown in the form of a slot extending longitudinally of it near the end opposite 85 to that provided with the stud 40, and through this opening 41 the screw 37 extends into the opening in the arm 36. The opening 41 is provided in the form of a slot merely to allow such freedom of movement 90 between the link 39 and the arm 36 as will compensate for the lack of rigidity of the somewhat slender and yielding arms 26 and 36, thereby avoiding binding and unnecessary friction between the parts. A pin 42 95 passes through each one of the studs 40 at the outer end of the sleeve 38, thereby preventing the withdrawal of the stud from the sleeve.

It will be noted that, there being a corresponding eccentrically mounted arm for 100 each main arm, and both series of arms radiating from their respective centers of rotation and being spaced equally therearound, each main arm and its corresponding eccentrically mounted arm will be parallel. Then, the pivotal connections of the 105 link with these two arms being equally distant on both arms from the center of rotation of the arm, all the links in the series will be parallel and will be maintained parallel throughout the rotation of both series 110 of arms. The links are thus presented in uniform position with respect to each other and to the position of an observer throughout the rotation of the arms, and the studs, 115 being rigidly attached to the links, are also thus uniformly presented. Thus articles of merchandise, or other articles to be exhibited, such as signs, if rigidly attached to the studs will also be uniformly presented to an 120 observer. This uniform presentation of the studs and objects mounted upon them is advantageous either with the rotation of the arms in a vertical plane or their rotation in 125 a horizontal plane with the device as illustrated in Fig. 5 of the drawings, hereinbefore referred to. Where it is thus desired to rotate the arms in a horizontal plane, the disk 28 has its opening fitted over a neck 27<sup>a</sup> 130 on the head 5<sup>a</sup> and has a screw 29 passing through its center into a lug 30<sup>a</sup> on the head



5<sup>a</sup>. The ring 31 with its arms 36 is mounted on the disk 28 and held thereon by means of the clips 32 in the manner hereinbefore described, and the hub 25 is rigidly mounted on the shaft 6<sup>a</sup> by means of the pin 24, and has arms 26, as hereinbefore described in connection with the arms rotating in a vertical plane. The links and studs connecting the arms 36 with the arms 26 are of the same construction and the manner of their operation is the same as has been described before. In this case it will be understood that the articles of merchandise, or other articles, are mounted on the studs in different positions than when the arms rotate in vertical planes. The manner of mounting the articles on the studs is not herein illustrated or described, since such mounting of the articles is subject to the requirements of the user of the apparatus.

While our improved device is most clearly illustrated as having two sets of main arms with their corresponding eccentrically mounted arms rotating in vertical planes, it will be noted that a single set of such arms may be used, as shown in perspective in Fig. 6. In either case, the head 5 is constructed with one of its sides removable, such as the side 43, which carries the journal for one of the main shafts 6 where two sets of main arms are used, or the side 44, which forms a back for the head 5' when one set of arms is used. In either case, where the vertically extending shaft 9 extends through the top of the head 5 it may be provided with a threaded socket 45 which is useful for receiving a corresponding threaded stud on additional display apparatus, which may be mounted to rotate with the shaft 9, but which, forming no part of our present invention, need not be herein described.

From the above description and illustrations in the drawings, it will be understood that our invention is capable of considerable modification to adapt it to different requirements without departure from the scope of the following claims:

1. In display apparatus, the combination of a series of main arms radiating from a common center and rigidly secured together to rotate about said center, means for rotating the arms, a disk stationarily mounted eccentric to the main arms, a ring rotatable on the disk, arms on the ring radiating from the center thereof and rotatable therewith, links pivotally connected on the arms on the ring and pivotally connected to the main arms, and studs rigidly secured to the links extending parallel to the axes of rotation of the arms, substantially as and for the purposes herein set forth.

2. In display apparatus, the combination of a series of rotatable main arms, a series of arms rotatable eccentrically to the main arms, links connecting the main arms and

the eccentrically rotatable arms, and studs on the links, substantially as and for the purposes herein set forth.

3. In display apparatus, the combination of a series of rotatable main arms, arms rotatable eccentrically with respect to the main arms, links pivotally connected to the eccentrically rotatable arms, sleeves on the main arms and studs on the links extending through the sleeves and projecting past said sleeves, substantially as and for the purposes herein set forth.

4. In display apparatus, the combination of a series of main arms, arms rotatable eccentrically with respect to the main arms, links pivotally connected to the main arms and connected to the eccentrically rotatable arms, and studs on the links, the links being provided with slots through which said links are connected to said eccentrically rotatable arms, substantially as and for the purposes herein set forth.

5. In display apparatus, the combination of a series of main arms, arms rotatable eccentrically with respect to the main arms, links connecting the main arms and the eccentrically rotatable arms, studs on the links, a main shaft, a hub rigidly mounted on the main shaft in which said main arms are rigidly mounted, the main arms radiating from the center of the shaft, a head in which the main shaft is journaled, driving mechanism for the apparatus, and detachable connection between the main shaft and the driving mechanism, substantially as and for the purposes herein set forth.

6. In display apparatus, the combination with a series of rotatable main arms, a disk stationarily mounted eccentric to the center of rotation of the main arms, a ring rotatable on the disk, arms on the ring rotatable therewith, links pivotally connecting the arms on the ring and the main arms, and studs rigidly secured to the links, substantially as and for the purposes herein set forth.

7. In display apparatus, the combination of a series of rotatable main arms, arms rotatable eccentrically with respect to said main arms, links pivotally connecting the main arms and the eccentrically rotatable arms, a shaft extending horizontally for rotating the main arms in a vertical plane, a bevel gear on the main shaft, a head in which the shaft is journaled, a vertically extending shaft journaled in the head, and a bevel gear thereon in mesh with the bevel gear on the main shaft, said vertically extending shaft extending above said head and being provided with means for attaching additional display apparatus, substantially as and for the purposes herein set forth.

8. In display apparatus, the combination of a series of rotatable main arms, a disk stationarily mounted eccentric to the center



of rotation of the main arms, a ring rotatable on the disk, arms on the ring radiating from the center thereof and rotatable therewith, links pivotally connecting the arms  
 5 on the ring to the main arms, studs on the links, and clips on the disk embracing the ring, each of said clips comprising a washer on one side and a washer on the other side of  
 10 said disk and ring, and a screw taking through the washers and through the disk, substantially as and for the purposes herein set forth.

9 In display apparatus, the combination of members rotatable with respect to each  
 15 other, links pivotally connecting the members, and studs on the links, substantially as and for the purposes herein set forth.

10. In display apparatus, the combination of members rotatable eccentrically with respect to each other, a sleeve on one of the  
 20 members extending parallel to the axes of rotation of the members, a stud extending through the sleeve and past it, a link rigidly secured to the stud and pivotal connection  
 25 between said link and the other of said mem-

bers, substantially as and for the purposes herein set forth.

11. In display apparatus, the combination of a series of rotatable main arms, a hub in which they are mounted, a shaft with which  
 30 the hub rotates, a head, a bearing for the shaft in the head, a neck on the bearing, a disk having an opening adapted to fit over the neck eccentrically positioned therein and  
 35 adapted to fit over the neck, means for preventing the rotation of the disk on the neck, a ring rotatable on the disk, means for preventing lateral displacement of the ring from the disk, arms on the ring, links connecting the arms on the ring to the main  
 40 arms, and studs on the links, substantially as and for the purposes herein set forth.

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