C. J. BEEMAN.

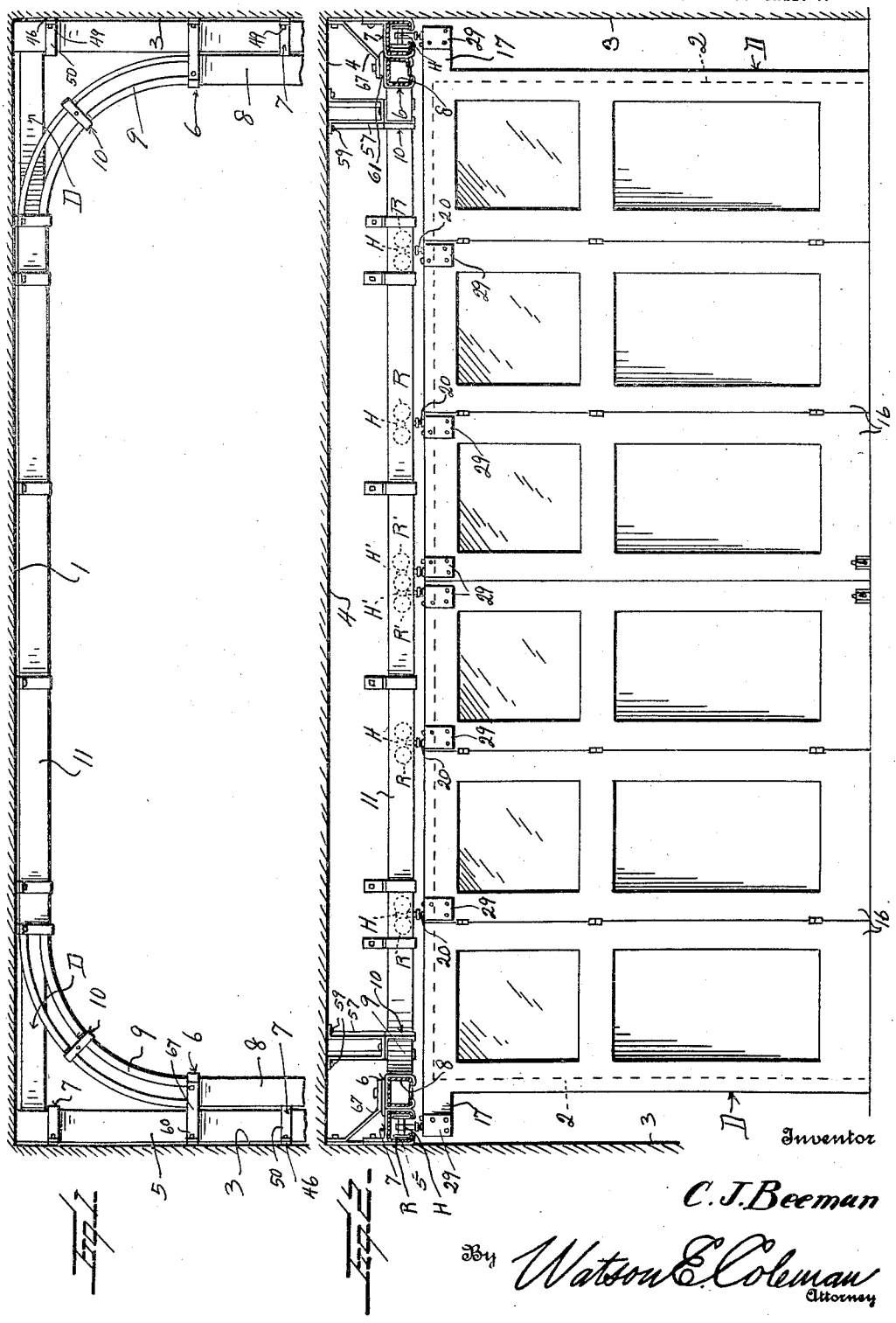
DOOR STRUCTURE.

APPLICATION FILED MAY 14, 1921.

1,411,561.

Patented Apr. 4, 1922.

2 SHEETS—SHEET 1.



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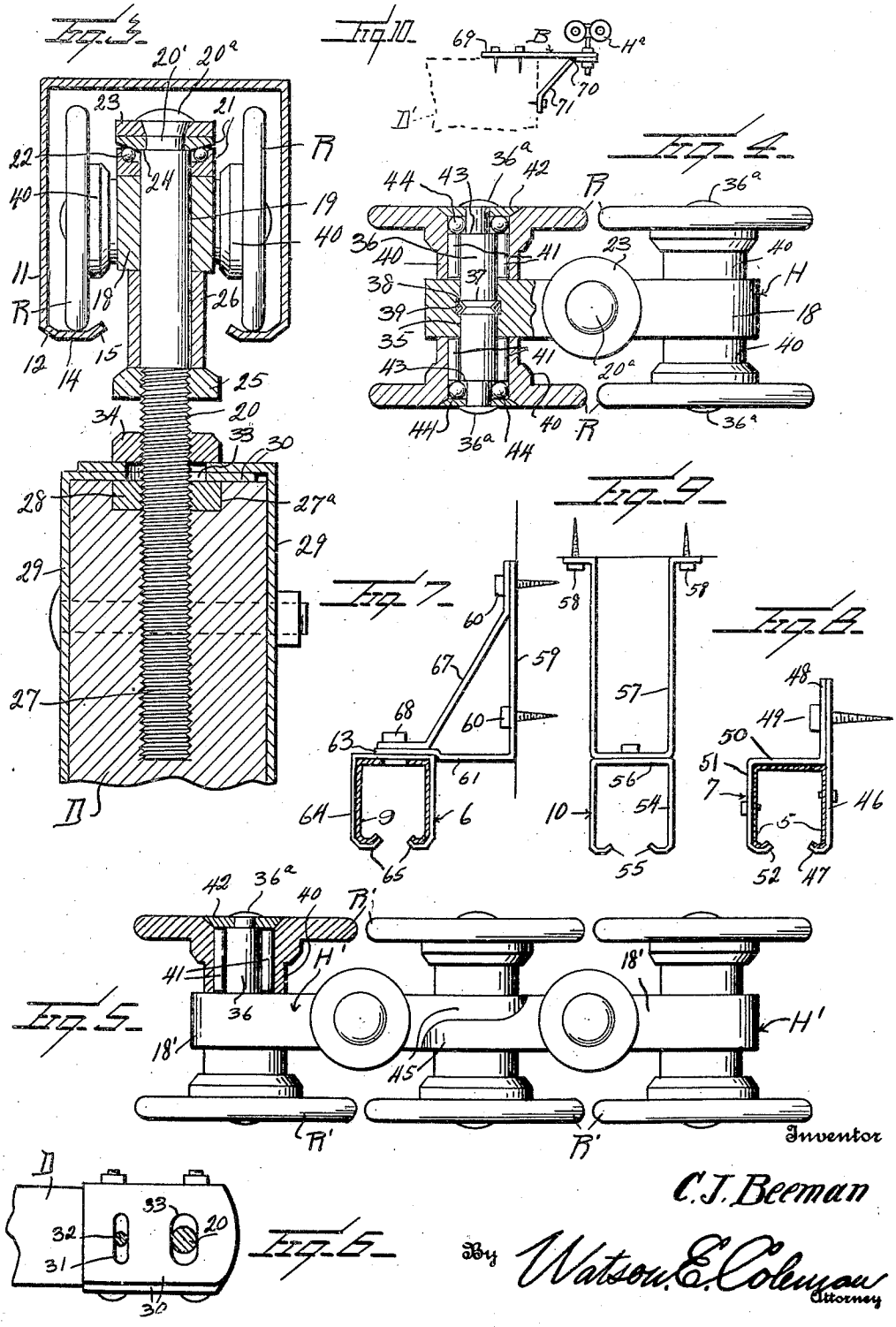
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UNITED STATES PATENT OFFICE.

CORNELIUS J. BEEMAN, OF AKRON, OHIO.

DOOR STRUCTURE.

1,411,561. Specification of Letters Patent. Patented Apr. 4, 1922.

Application filed May 14, 1921. Serial No. 469,421.

To all whom it may concern:

Be it known that I, CORNELIUS J. BEEMAN, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Door Structures, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in door structures and has relation more particularly to a door structure of a sliding type and which is adapted to be employed in connection with large doorways such as comprised in barns, garages and the like, and it is an object of the invention to provide a novel and improved structure of this general character whereby the door proper may be supported or suspended in a manner to facilitate the requisite sliding movement and whereby the door, when in open position, may be arranged at an angle to the wall containing the doorway to thereby economize space while at the same time leaving the doorway entirely free and unobstructed.

Another object of the invention is to provide a door structure embodying two doors supported for sliding movement, one relative to the other, in association with a doorway, together with means for suspending or supporting the doors in a manner whereby said doors may come into close contact one with the other when in closed position.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved door structure whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a fragmentary view in top plan illustrating a door structure constructed in accordance with an embodiment of my invention;

Figure 2 is a view partly in elevation and partly in vertical section illustrating my improved structure with the doors in closed position;

Figure 3 is an enlarged fragmentary view partly in section and partly in elevation illustrating a supporting means for the door;

Figure 4 is a fragmentary view partly in top plan and partly in section of one of the hangers herein disclosed;

Figure 5 is a view in top plan of a pair of coacting hangers constructed in accordance with a further embodiment of my invention;

Figure 6 is a fragmentary detail view partly in section and partly in top plan of the elements directly associated with the door;

Figure 7 is a view in side elevation of one of the brackets herein disclosed;

Figure 8 is a view in side elevation of a second form of bracket herein embodied;

Figure 9 is a view in elevation of the third form of bracket as herein employed.

Figure 10 is a fragmentary elevational view illustrating a modified form of my invention.

As disclosed in the accompanying drawings, 1 denotes the front wall of a garage or other building structure provided with a relatively wide doorway 2, two or more side walls 3 and a ceiling 4. Extending along the side walls 3 are the overhead straight tracks 5 supported in applied position through the instrumentality of the brackets 7 to be hereinafter more particularly referred to.

Parallel with the tracks 5 are the tracks 8 supported, as will hereinafter be explained, by the brackets 6. Each of the tracks 8 is continued by an arcuate track 9 preferably having a relatively long radius. The track 9 is supported by a bracket 10 to be more particularly referred to and the track 9 is continued by a track 11 extending along the doorway 2 at a point thereabove. This track 11 is common to both of the arcuate tracks 9 and is supported by the brackets 7.

The tracks 5, 8, 9 and 11 are all substantially of the same cross sectional configuration and each consists of an inverted trough or U-shaped member having its lower marginal portions defined by an inwardly arranged flange 12, the intermediate portions of which provide bearing surfaces 14. Each of the flanges 12 at opposite sides of its bearing surface 14 is beveled inwardly and up-

wardly, as at 15, in order to assure the hangers, to be hereinafter more particularly referred to, properly traveling upon the bearing surfaces 14 of the various tracks.

In the present embodiment of my invention, I employ two doors D each comprising a plurality of hingedly connected sections 16, preferably three in number. Coacting with the upper rear corners of each of the two outer sections 16 of a door D are the hangers H and a third hanger H also coacts with an extension or arm 17 at the upper rear corner of the inner section 16 of the door. This last hanger H cooperates with a straight trackway 5 while the first named hangers H are associated with the tracks 8, 9 and 11.

Each of the hangers H embodies a cross head 18 having a central opening 19 through which is freely disposed an end portion of a stem 20 and about which the cross head 18 is adapted to swing or rock. The stem 20 extends upwardly or beyond the cross head 18 and surrounding said extended portion of the stem are the cone washers 21 between which are interposed the ball bearings 22. Overlying the outer washer 21 is a holding washer 23 which surrounds the reduced portion 20′ of the stem 20 and which reduced portion is upset, as at 20^a to hold the outer washer 21 against the shoulder 24 surrounding the reduced portion 20′ and whereby the cross head 18 and the stem 20 are held against relative movement in one direction lengthwise of the stem.

Carried by the stem 20 inwardly of the cross head 18 is a nut 25 and interposed between said nut 25 and the cross head 18 is a sleeve or bushing 26 surrounding the stem 20. This sleeve or bushing 26 serves to limit relative movement of the stem 20 in one direction and the cross head 18 in the opposite direction.

The upper rear corner portion of each of the door sections 16 and of the extension or arm 17 is provided with a socket 27, the upper portion 27^a of which is enlarged and angular in cross section. Fitting within the enlarged portion 27^a is a metallic block 28 through which is threaded the stem 20, said stem 20 extending within the socket 27.

Bolted or otherwise secured to the side faces of each of the rear upper corners of the two outer door sections 16 and the extension or arm 17 are the cleats 29 provided at their upper portions with the inwardly directed flanges or wings 30 which overlap and are provided with registering slots 31 through which an anchoring screw 32 or the like is disposed, said screw being engaged with the adjacent portion of the door section 16 or the extension or arm 17. The flanges or wings 30 are also provided with the registering slots 33 through which the stem 20 is disposed, said flanges or wings serving to hold the metallic block 28 in applied position. Threaded upon the stem 20 and coacting with the outermost flange or wing 30 is a locking nut or burr 34.

The opposite end portions of the cross head 18 are provided therethrough with transversely directed openings 35 and disposed through each of said openings 35 and extending beyond opposite sides of the cross head 18 is a spindle 36. The central portion of the spindle 36 is provided therearound with an annular peripheral groove 37 adapted to register with an annular groove 38 produced in the wall of the coacting opening 35. Coacting with said registering grooves 37 and 38 is an expansible ring 39 whereby the spindle 36 is locked to the cross head 18 and particularly against endwise movement.

Rotatably supported by the extended end portions of each of the spindles 36 is a roller R including a hub 40 surrounding the extended portion of the spindle. Associated with the extended end portion of the spindle and the hub are the roller bearings 41. The roller R is held to the spindle 36 by the washer or cap 42 through which the spindle extends, the outer end portion of the spindle being upset, as at 36^a, to hold the washer or cap 42 against displacement. Each outer end portion of the spindle 36, with which the washer or cap 42 coacts is reduced in diameter, resulting in an annular shoulder 43. Between each of the shoulders 43 and the adjacent washer or cap 42 are the ball bearings 44.

The rollers R embodied in the hanger H carried by the extension or arm 17 coacts with the flat bearing surfaces 14 of the track 5 while the rollers R of the remaining hangers H coact with the similar bearing surfaces of the tracks 8, 9 and 11.

Coacting with the upper front corner of each of the outer sections 16 of a door D is a hanger H′ substantially of the same construction as each of the hangers H hereinbefore referred to except that the cross head 18′ has its outer end portion reduced, as at 45, in width, so that when the doors D are moved into closed position, the adjacent edges of the door will substantially contact and the corresponding end portions of the cross heads 18′ will interlock.

Each of the hangers H′ is provided with three rollers R′, two of said rollers being arranged at opposite sides of the rear or inner portion of the cross head 18′ and the third roller being arranged to one side of the cross head 18′ at its outer end. The roller R′ of one of the cross heads 18′ is to one side of said cross head and the single roller carried by the second cross head 18′ is at the side thereof remote from the first named single roller. By this means the single rollers, when the doors D are in closed

position, are arranged substantially directly above the meeting or abutting edges of the doors. This arrangement is of particular advantage as the hangers H′ offer no hindrance or obstruction to the desired closing of the doors.

The bracket 7, hereinbefore referred to is adapted to be secured to a side wall 3 and comprises an elongated strip 46 provided at its lower end portion with an outwardly disposed foot 47 which snugly receives a portion of a flange 12 of a track 5. Associated with the strip 46 is a second strip 48 overlying the upper portion of the strip 46 and to said overlying portions is disposed a screw 49 or kindred headed shank for holding the bracket 7 in applied position.

The lower portion of the strip 48 is continued by an outstanding extension 50 which has close contact with the upper portion of the coacting trackway and said extension 50 is continued by a downwardly disposed extension 51 having close contact with the adjacent side of the coacting track and terminating in an inwardly directed foot 52 which snugly receives a portion of an adjacent flange 12.

The bracket 10 is of a type adapted to be secured to the ceiling 4 and comprises a member 54 substantially in the form of an inverted U and which has its extremities provided with the inwardly directed feet 55 which snugly receive the adjacent portions of the flanges 12. Secured to the central part of the intermediate portion 56 of the member 54 is a loop strap 57, the extremities of which are anchored to the ceiling 4 by the screws 58 or the like.

Each of the brackets 6 comprises an elongated strip 59 adapted to be secured at its upper portion to a side wall 3 or the like by the screws 60 or kindred headed members. The lower portion of the strip 59 is provided with an outwardly disposed foot 61. The foot 61 has its outer portion 63 upwardly offset. This offset portion 63 receives a member 64 substantially in the form of an inverted U and which straddles from above a portion of an adjacent track 8.

The lower end portions of the side arms of the member 64 are provided with the oppositely directed feet 65 which snugly receive portions of the adjacent flanges 12 of the track 8.

Interposed between the upper portion of the strip 59 and the offset portion 63 of the foot 61 is a brace or reinforcing strap 67, the upper end of said strap being anchored by the upper screw or headed member 60 while the lower or opposite end portion of said strap 67 is anchored to the offset portion 63 by the holding bolt 68 or the like and which bolt also coacts with the member 64 and the track 8.

In the embodiment of the hanger as is particularly illustrated in Figure 5, the roller bearings 44 are not employed. It is also to be noted that the curved track 9 comprises two sections riveted or otherwise secured to the coacting brackets, the construction of the said track 9 being particularly shown in Figures 1 and 8.

Figure 10 as disclosed in the embodiment of my invention is particularly designed for use in connection with a small or light door and wherein such door is of a common type. The hanger H^a is operatively engaged with a bracket B, this bracket B comprises an elongated strip 69 having one end portion anchored to the upper edge of the door D′, said strip being preferably provided with a series of longitudinally spaced openings so that the strip 69 may be adjusted lengthwise with respect to the door D′ as the occasions of practice may require. Pivotally engaged, as at 70, is a bracing strip 71 which is adapted to be anchored to the adjacent vertical edge of the door D′.

From the foregoing description it is thought to be obvious that a door structure constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

1. In combination with a trackway and a pair of doors, hangers carried by the doors and traveling along the trackway, a hanger of each of the doors being positioned adjacent the meeting edge of the door and extending beyond said meeting edge, said last named hangers interfitting when the meeting edges of the doors are substantially in contact.

2. In combination with a trackway and a pair of doors, hangers carried by the doors and traveling along the trackway, a hanger of each of the doors being positioned adjacent the meeting edge of the door and extending beyond said meeting edge, each of said last named hangers including a head having an end portion extending beyond the meeting edge of the door, said extended portion being transversely reduced, said reduced portion overlying the similarly reduced portion of the corresponding hanger of the other door when the meeting edges of the doors are substantially in contact.

3. In combination with a trackway and a pair of doors, hangers carried by the doors and traveling along the trackway, a hanger

of each of the doors being positioned adjacent the meeting edge of the door and extending beyond said meeting edge, each of said last named hangers including a head having an end portion extending beyond the meeting edge of the door, said extended portion being transversely reduced, said reduced portion overlying the similarly reduced portion of the corresponding hanger of the other door when the meeting edges of the doors are substantially in contact, and a roller supported by the reduced portion of the head of each of said hangers, said rollers being at opposite sides of said heads.

In testimony whereof I hereunto affix my signature.

CORNELIUS J. BEEMAN.