Feb. 5, 1952 J. F. MONGER 2,584,904

HINGE MECHANISM FOR SWINGING BARRIERS

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Fig. 1

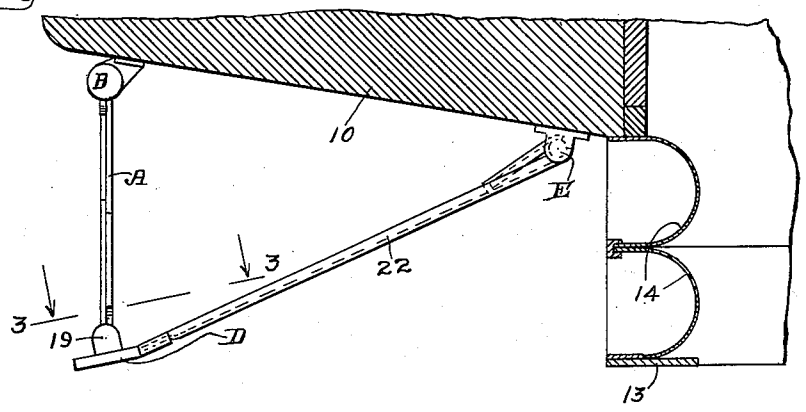


Fig. 2

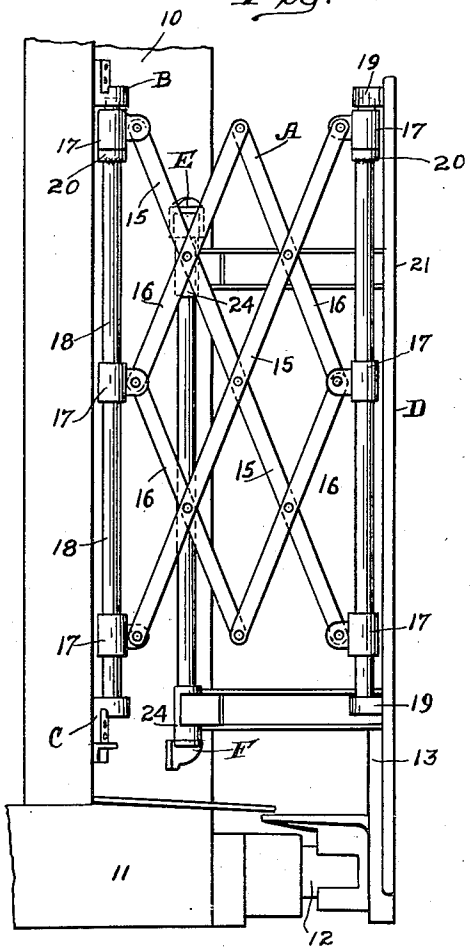


Fig. 3

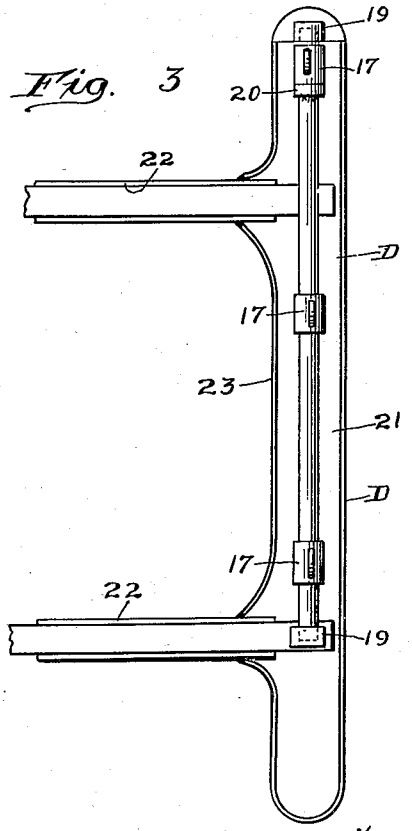


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Fig. 4

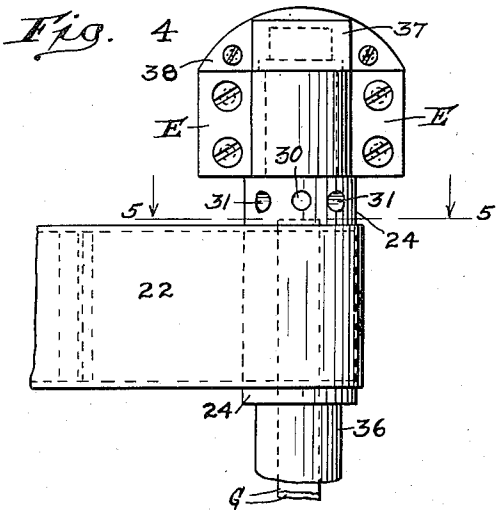


Fig. 7

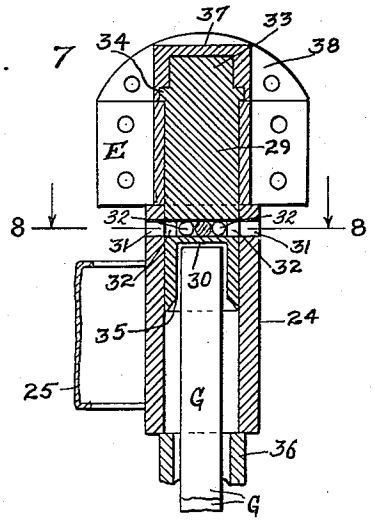


Fig. 5

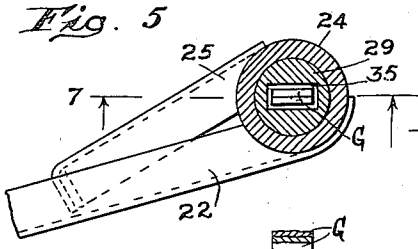


Fig. 10

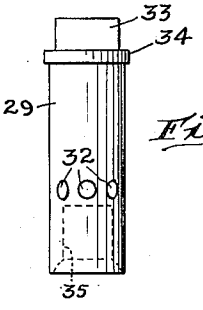


Fig. 8

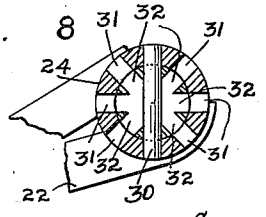


Fig. 6

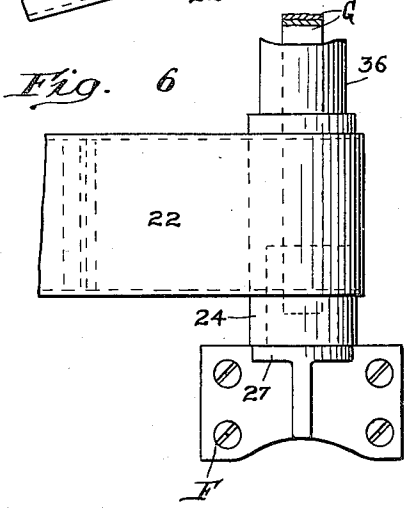


Fig. 9

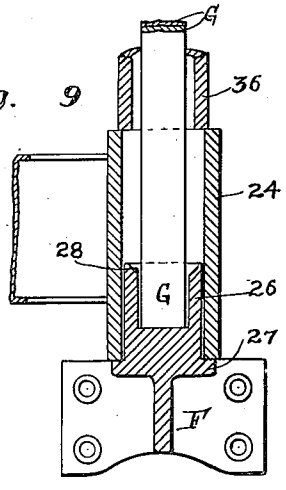


Fig. 11

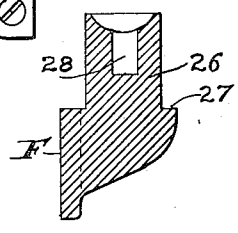


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Fig. 12

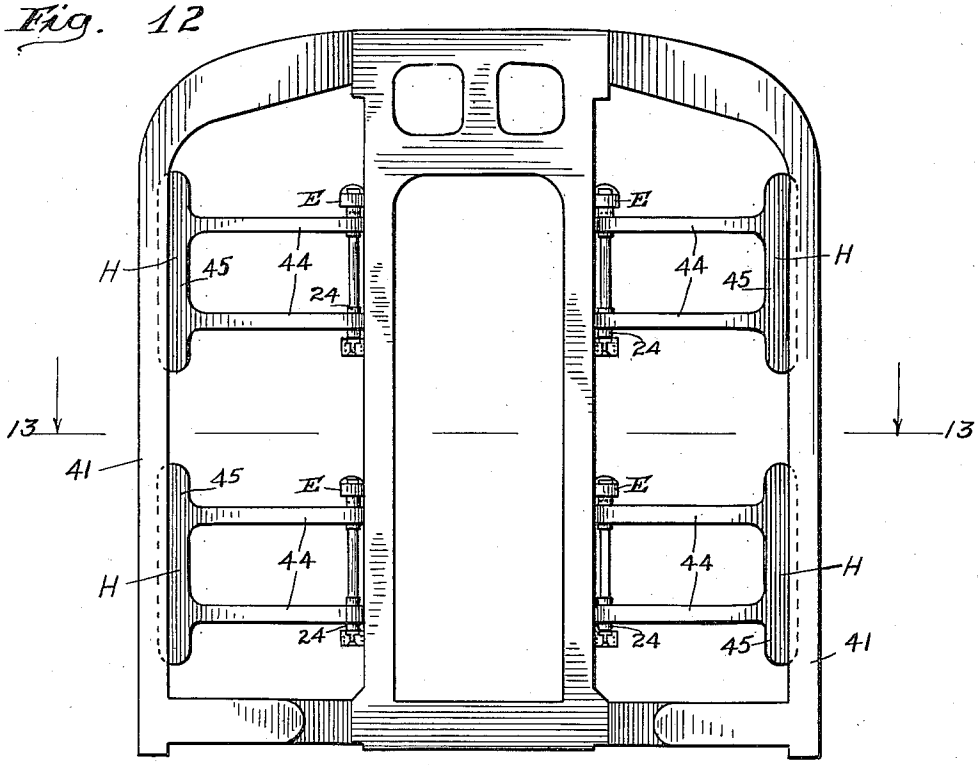
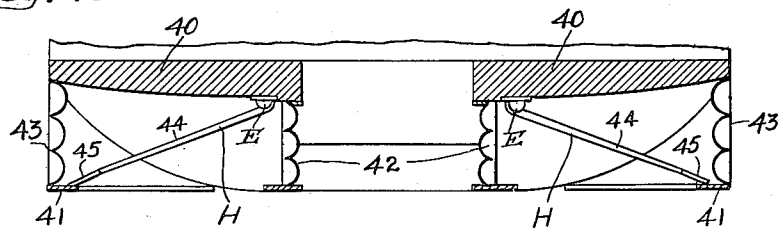



Fig. 13

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# UNITED STATES PATENT OFFICE

2,584,904

## HINGE MECHANISM FOR SWINGING BARRIERS

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Application September 19, 1945, Serial No. 617,314

2 Claims. (Cl. 16—184)

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This invention relates to improvements in hinge mechanism for extensible barriers especially adapted for use in connection with railway cars.

One object of the invention is to provide spring actuated hinge mechanisms for barriers between railway cars, wherein means is provided for adjusting the tension of the spring means.

A more specific object of the invention is to provide simple, efficient, and reliable mechanism as specified in the preceding paragraph, for yieldingly holding extensible barriers, such as gates or vestibule diaphragms of cars, in contact with each other under all conditions of service.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is a horizontal sectional view, partly broken away, of the end of a car at one side of the longitudinal center of the same, illustrating my improvements in connection therewith. Figure 2 is a side elevational view looking from left to right in Figure 1. Figure 3 is a transverse, vertical sectional view, corresponding substantially to the line 3—3 of Figure 1. Figure 4 is an elevational view, on an enlarged scale, of the upper portion of my improved mechanism at the hinged end of the means for yieldingly holding the barrier extended, certain parts being broken away. Figure 5 is a horizontal sectional view, corresponding substantially to the line 5—5 of Figure 4. Figure 6 is a view, similar to Figure 4, showing the lower portion of the mechanism at the hinged end of the means for yieldingly holding the barrier extended. Figure 7 is a vertical sectional view, corresponding substantially to the line 7—7 of Figure 5, showing the torsional spring bar in elevation. Figure 8 is a horizontal sectional view, corresponding substantially to the line 8—8 of Figure 7, the locking pin being shown in plan. Figure 9 is a central vertical sectional view of the mechanism shown in Figure 6, in a plane parallel to the end wall of the car. Figure 10 is a side elevational view of the stub bearing shaft shown in Figure 7. Figure 11 is a vertical sectional view of the lower supporting bracket shown in Figures 6 and 9, said section being in a plane at right angles to the section shown in Figure 9. Figure 12 is an end elevational view of the diaphragm construction at the end of a railway car, illustrating another embodiment of my invention. Figure 13 is a transverse, horizontal sectional view, corresponding substantially to the line 13—13 of Figure 12.

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In said drawings, referring first to the embodiment of the invention illustrated in Figures 1 to 11 inclusive, 10 indicates the end wall of a railway passenger car, 11 the end platform carrying the buffing mechanism 12 which cooperates with the usual buffer face plate 13, all well-known in this art. The usual vestibule diaphragm is indicated by 14.

As shown in Figures 1 to 11 inclusive, my improved extensible barrier comprises broadly a pantograph side gate A extending between the ends of adjacent cars; top and bottom supporting brackets B and C for hinging the gate to the car; a swinging supporting member D to which the outer end of the gate is hinged; top and bottom supporting brackets E and F hinging the member D to the end of the car; and a torsion spring member G for yieldingly urging the member D to swing outwardly.

Two of such barriers are located at each end of the car, the structure being duplicated at opposite sides of the same, and the barriers of each car contacting the barriers of the adjacent car, thus providing effective guard means extending from one car to the other to prevent passengers accidentally stepping or falling in-between cars in boarding the train from loading platforms.

The pantograph gate A, as shown in Figure 2, comprises a pair of relatively long bars 15—15 and four relatively shorter bars 16—16—16—16. The bars 15—15 are crossed and pivotally connected to each other at a point midway between their ends. The bars 16 are arranged in upper and lower pairs, the members of the upper pair being pivotally connected to each other at their upper ends and those of the lower pair being pivotally connected to each other at their lower ends. The upper pair of bars 16 are pivotally connected midway between their ends to the upper portions of the bars 15—15 at points substantially midway between the upper extremities of these bars and the pivotal connection between the same. The lower pair of bars 16 are pivotally connected in a similar manner to the lower portions of the bars 15—15. The pantograph bar structure thus provided is supported at the opposite ends by tubular sleeves 17—17 mounted on vertically disposed, round bars or shafts 18—18 at the inner and outer ends of the gate A. The bar 18 at the inner end of the gate has its top and bottom ends journaled in the supporting brackets B and C, which are fixed to the end wall 10 of the car, and the bar 18 at the outer end of the gate has its top and bottom ends journaled in

brackets 19—19 on the swinging supporting member D. The sleeves 17 carried by each bar 18 are three in number, upper, lower, and intermediate. At the inner end of the gate the upper and lower ends of the crossed bars 15—15 are pivotally connected to the upper and lower sleeves 17—17 and the lower and upper ends of the top and bottom short bars 16—16 are pivotally connected to each other and the intermediate sleeve 17. At the front end of the gate, the upper and lower ends of the crossed bars 15—15 are pivotally connected to the upper and lower sleeves 17—17 at the front end of the gate, and the upper end of the lower bar 16 and the lower end of the upper bar 16 are pivotally connected to each other and the intermediate bracket 17 at the front end of the gate.

The sleeves 17—17 are all freely rotatable on the bars 18—18 and the lower and intermediate sleeves are also freely slidable up and down on said bars. The upper sleeve of each bar 18 is restricted to rotary movement on said bar, being confined between the lower side of the upper supporting bracket for the bar and a collar 20 fixed to the bar. The collars 20—20 are fixed to the bars 18—18 preferably by being welded thereto.

The swinging supporting member D is preferably made of heavy steel plate and comprises an upstanding post section 21 and upper and lower, spaced, parallel arms 22—22 extending inwardly from the section 21. The post 21 is in the form of a flat bar or plate of the shape shown in Figure 3 and is flanged around its edges, as indicated at 23, to rigidify the same. The arms 22—22 are of channel form and have their outer ends fixed to the post 21 in any suitable manner but are preferably welded thereto. The brackets 19—19, which support the outer end of the pantograph gate A are carried by the post section 21 of the supporting member D, being preferably welded thereto. As shown most clearly in Figure 1, the arms 22—22 are angularly disposed with respect to the post section 21.

At the inner end thereof each arm 22 carries the tubular sleeve portion 24, which is vertically disposed and is welded thereto. Each arm 22 is preferably reenforced by an inclined bracing strip 25 of channel formation, at the end thereof which carries the sleeve 24, the strip being welded at opposite ends to the inner side of the arm 22 and the sleeve 24. The sleeves 24—24 of the upper and lower arms are in vertical alignment, the lower sleeve being journaled on the upstanding cylindrical stub shaft 26 of the supporting bracket F, which bracket is fixed to the end wall of the car some distance inwardly from the brackets B and C, which support the gate A. An annular supporting flange 27 for the lower sleeve is provided at the lower end of the stub shaft 26. The upper end of the stub shaft 26 is provided with an upwardly opening, transversely extending slot 28 which forms a seat for the bottom end portion of the torsion spring member G.

The upper sleeve 24 has a stub shaft 29 adjustably secured thereto. The stub shaft 29 has its lower end telescoped within the upper sleeve 24 and secured thereto by a retaining pin 30. As shown most clearly in Figure 8, the sleeve 24 and the stub shaft 29 are provided with a plurality of circumferentially spaced, diametrically arranged openings 31 and 32 adapted to accommodate the pin 30 for fixedly securing the stub shaft to the sleeve 24 in different positions of relative rotary adjustment. As will be evident, when the pin 30 is withdrawn, the stub shaft 29 may be rotatably adjusted with respect to the sleeve 24 and locked to the sleeve in the newly adjusted position by engaging the pin through the openings which are brought into alignment. As shown, four sets of such diametrically aligned openings are provided, thereby making it possible to lock the sleeve and the stub shaft together in various positions of relative rotary adjustment, eight possible positions being provided in each relative turn of the sleeve and stub shaft. As will be evident, the fineness of the degree of possible adjustment depends upon the number of openings provided, which number may be varied as found expedient.

The upper end of the stub shaft 29 extends through and is journaled in the supporting bracket E, which is fixed to the end wall 10 of the car. The end of the stub shaft 29 above the supporting bracket E is formed with a square portion 33 to receive a wrench for turning the stub shaft in adjusting the same. The projecting portion of the stub shaft is preferably also provided with an annular flange 34, immediately below the square portion thereof, adapted to rest on top of the supporting bracket E to support the stub shaft. At the lower or inner end thereof, the stub shaft 29 is provided with a transverse slot 35 identical with the slot 28 of the bracket F, forming a seat for the upper end of the torsion spring member G.

The torsion spring member G, as shown, preferably comprises two flat, elongated spring bars of rectangular cross section, which are in face to face contact with each other. The member G extends from one arm 22 to the other and into the upper and lower sleeves 24—24 of said arms, having its upper and lower ends seated in the slots or seats 35 and 28 of the upper and lower stub shafts 29 and 26. That portion of the torsion spring member G which is located between the upper and lower sleeves 24—24 is preferably housed within a tubular sleeve 36, which extends from the upper sleeve 24 to the lower sleeve 24.

As a precaution against tampering, the projecting upper end portion of the adjustable stub shaft 29 is covered by a cap 37 which is integral with a bracket 38 secured to the end wall of the car. The torsion spring G, which has its lower end secured to the fixed bracket F and its upper end fixed to the sleeve 24 of the upper arm 22 of the swinging supporting member D, by means of the stub shaft 29, yieldingly resists inward swinging movement of the member D and urges the same outwardly, thereby maintaining the pantograph gate A yieldingly extended. Figures 1 and 2 illustrate the gate fully extended and, as will be evident, when adjacent cars are coupled together, the buffing mechanism 12 and the diaphragm 14, together with the two gates A—A at opposite sides of the car, will be partly compressed, thus holding the post portions of the supporting members of the pantograph gates in tight flat faced engagement with each other when the cars are on substantially straight track. The torsional spring member G of the supporting member D is thus twisted by relative rotation of the upper end thereof which is fixed to the upper arm 22 with respect to the lower end, which is fixed to the lower supporting bracket F, thereby increasing the tension of the spring members. The spring member G is preferably so adjusted that contact of the post D of the pantograph gate A with the post of the gate of an adjacent car is assured in all relative positions of the coupled cars in service. Adjustment of the tension of any of the springs G of the swinging supporting members for the

pantograph gates is effected by first removing the cap 37 by detaching the bracket 38 from the wall of the car. The pin 30 is then driven out to permit rotation of the stub shaft 29 with respect to the upper arm 22 of the supporting member D. The stub shaft 29 is then turned by a wrench engaged with the square section 33 thereof to twist the spring member G and provide the desired tension. The pin 30 is then applied to lock the stub shaft to the sleeve 24 of the upper arm 22 of the member D by engaging the same through the set of openings 31 and 32 which have been brought into alignment. As hereinbefore pointed out, the arrangement of the openings 31 and 32 provides for alignment of one set of openings and locking of the stub shaft 29 and the sleeve 24 together in eight different positions of adjustment for each complete relative rotation of the stub shaft and sleeve.

Referring next to the embodiment of the invention illustrated in Figures 12 and 13, 40 indicates the end wall of a streamlined car, provided with the usual buffer face plate 41 and inner and outer diaphragms 42 and 43.

In carrying out my invention as shown in Figures 12 and 13, I preferably provide four swinging supporting members H—H—H—H for yieldingly holding the diaphragms 42 and 43 extended, the supporting members being arranged in pairs at opposite sides of the car with one member of each pair arranged above the other. Each supporting member H comprises upper and lower arms 44—44 and a vertical post section 45 at the outer ends of the arms. The arms 44—44 are hinged to the car wall 40 at their inner ends in the same manner as the arms 22—22 of the supporting member D hereinbefore described and operate in the same manner, being urged to swing outwardly by a torsion spring similar to the spring member G and adjusted in a like manner. As shown in Figures 12 and 13, the post 45 of each swinging supporting member H bears on the inner side of the face plate 41 adjacent the corresponding outer diaphragm member 43 and has sliding contact with the face plate. As will be evident, the four swinging supporting members H serve to yieldingly hold the diaphragms 42 and 43 expanded through action of the torsion springs which urge the supporting members H to swing outwardly against the diaphragm face plate 41.

I claim:

1. In a hinge mechanism for a swinging barrier for a railway car, the combination with a pair of upper and lower fixed supporting brackets on the car, said upper bracket having a bearing cap formed integral therewith; of upper and lower tubular sleeves rigid with said barrier; an upper stub shaft rotatably mounted in and completely enclosed by said bearing cap of said upper bracket, said stub shaft having the upper end formed to receive a wrench and being telescoped at its lower end within the upper sleeve, said stub shaft being rotatably adjustable in said upper sleeve; means for locking said stub shaft to said upper sleeve in adjusted position with respect to said upper sleeve for rotation in unison with said upper sleeve; an upstanding lower stub shaft rigid with said lower supporting bracket and projecting into said lower sleeve for rotatably supporting the same on said lower bracket; and a vertically extending torsion spring bar member connected at its upper end to said upper stub shaft for rotation in unison therewith and connected at its lower end to said lower stub shaft and locked against rotation with respect to the latter.

2. In a hinge mechanism for a swinging supporting member, the combination with top and bottom tubular sleeves on said supporting member; of an elongated tubular member between said sleeves in vertical alignment therewith and bearing at its top and bottom ends on said sleeves; a top stub shaft having its lower end telescoped within said top sleeve, said shaft being rotatably adjustable in said top sleeve, said shaft having a transverse slot at its bottom end, the upper end of said shaft being formed to receive a wrench for rotating the same, a top bearing bracket including a bearing sleeve closed at its upper end in which the upper end of said shaft is journaled; means for locking said shaft to said top sleeve in adjusted position; a bottom bearing bracket having an upstanding stub shaft thereon in vertical alignment with said first named stub shaft, said second named stub shaft being journaled in said bottom tubular sleeve and having a transverse slot at its upper end; and an elongated flat torsion spring bar within said elongated tubular member and extending into said top and bottom sleeves with its top and bottom ends seated in the slots of said first and second named stub shafts respectively.

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