Aug. 20, 1935. J. F. O'CONNOR 2,011,773

RAILWAY DRAFT RIGGING

Filed July 20, 1931 2 Sheets-Sheet 1

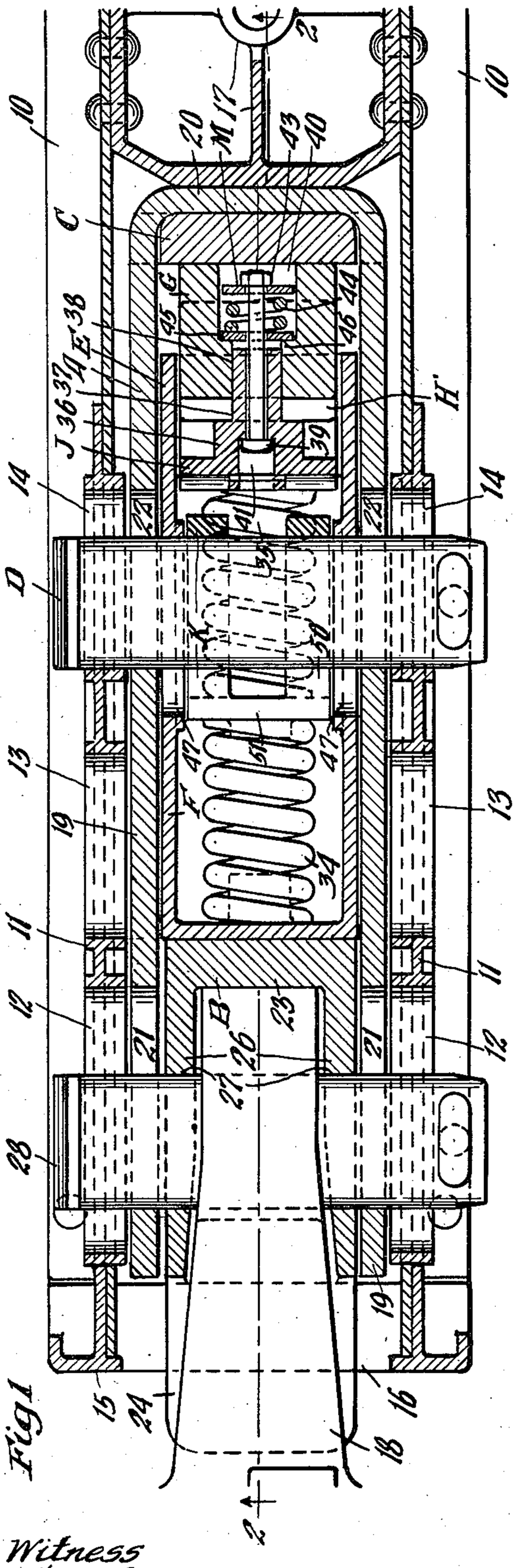



Fig. 1

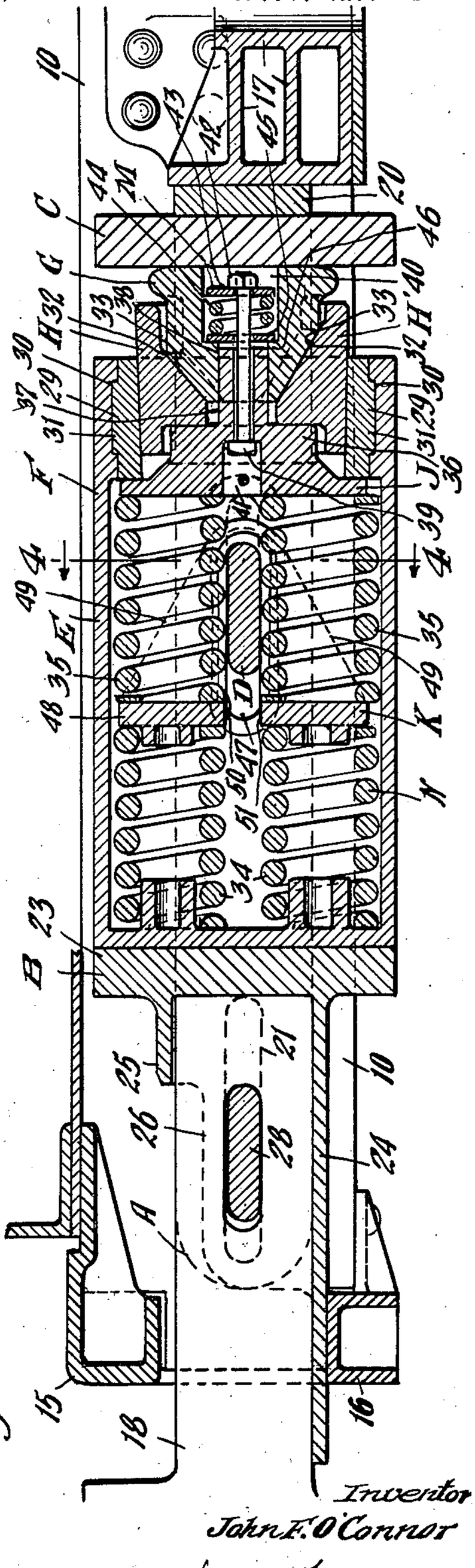



Fig. 2

Witness
Wm Geiger

Inventor
John F. O'Connor

By Henry Fuchs Atty.

Aug. 20, 1935. J. F. O'CONNOR 2,011,773

RAILWAY DRAFT RIGGING

Filed July 20, 1931 2 Sheets-Sheet 2

Fig. 3

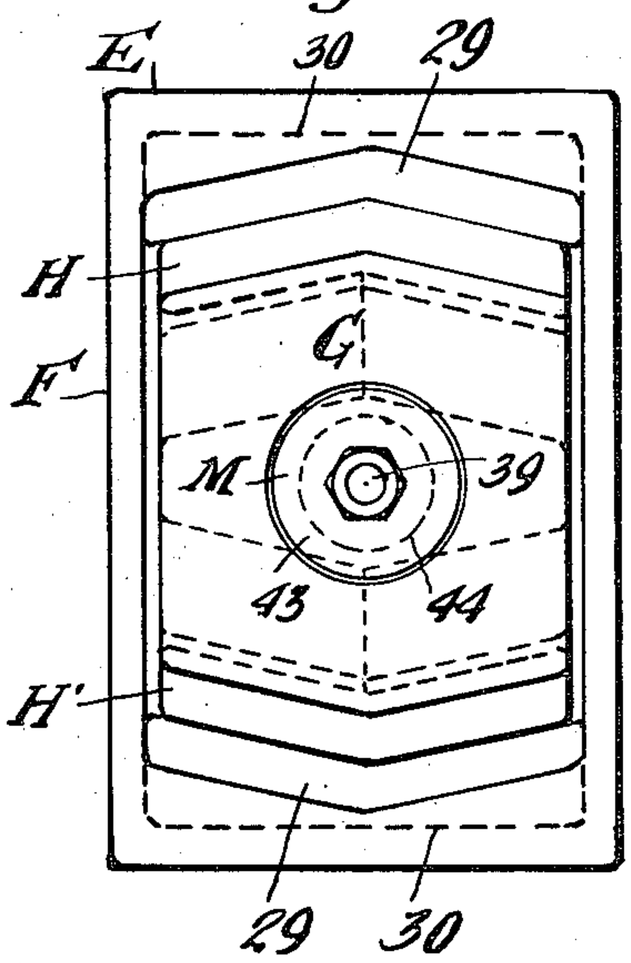



Fig. 4

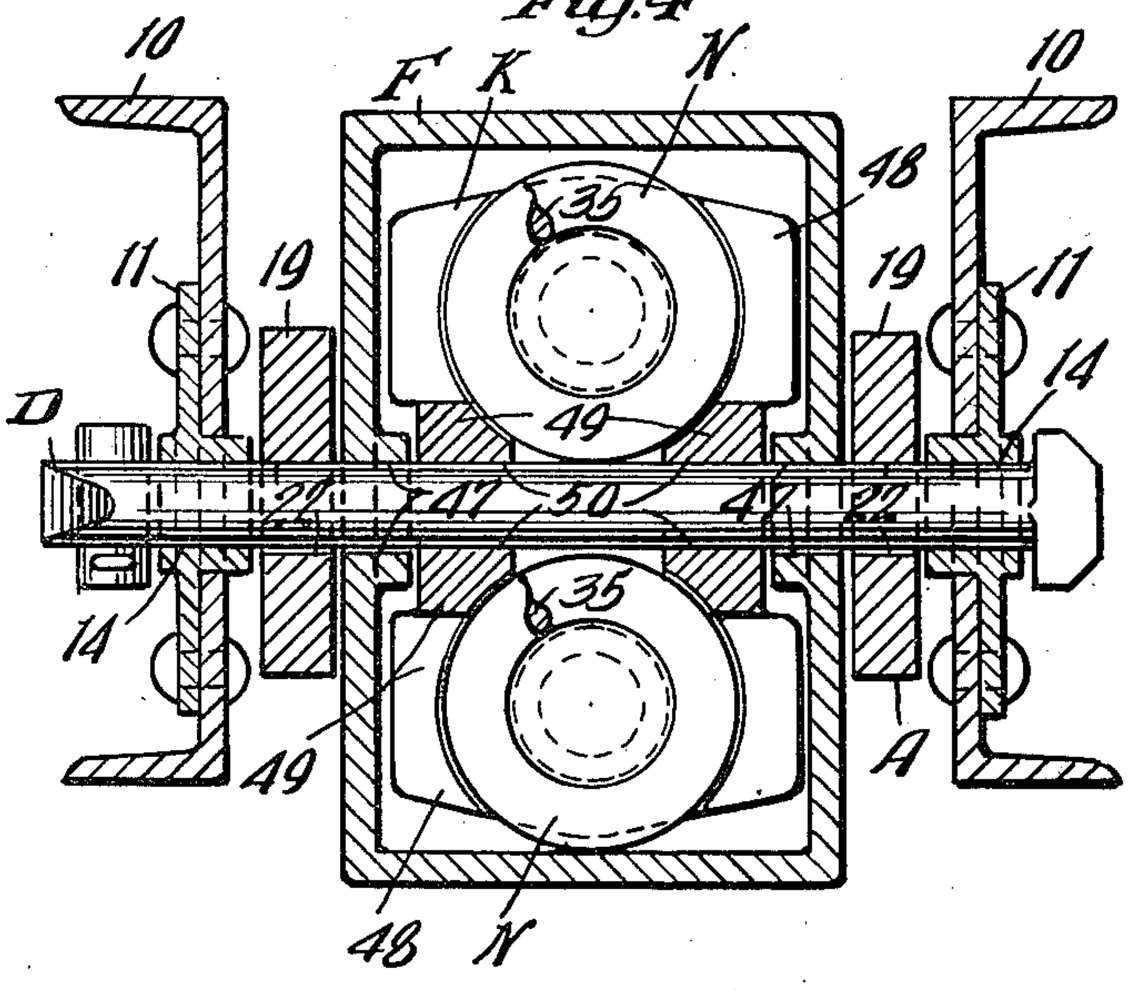
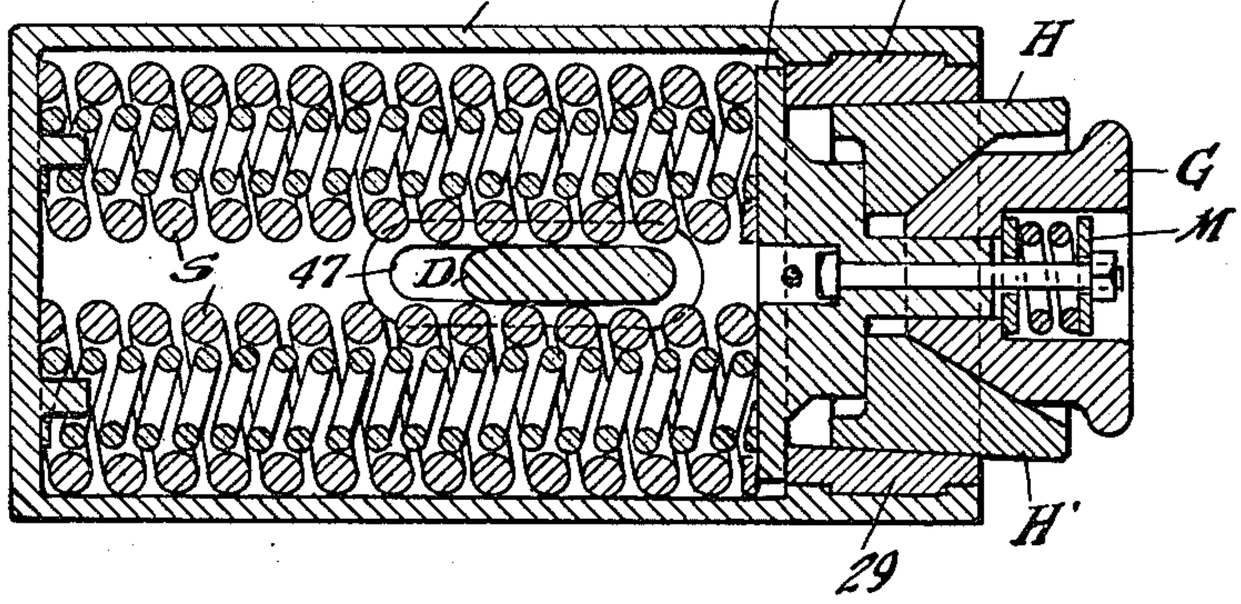



Fig. 5




Witness
Wm. Geiger

Inventor
John F. O'Connor

By Henry Fuchs Atty.

Patented Aug. 20, 1935 2,011,773

# UNITED STATES PATENT OFFICE

2,011,773

## RAILWAY DRAFT RIGGING

John F. O'Connor, Chicago, Ill., assignor to W. H. Miner, Inc., Chicago, Ill., a corporation of Delaware

Application July 20, 1931, Serial No. 551,935

8 Claims. (Cl. 213—22)

This invention relates to improvements in railway draft riggings.

One object of the invention is to provide a railway draft rigging having longer travel in buff than in draft to compress the shock absorbing means of the rigging to a greater degree in buff than in draft to effectively cushion the heavier buffing shocks, wherein the draft rigging is particularly designed for use in connection with slotted cheek plates secured to the draft sills, the arrangement being such that the buffing shocks are transmitted through the shock absorbing mechanism to a rear stop casting and the draft shocks through said shock absorbing mechanism to a stop key cooperating with the cheek plates.

A more specific object of the invention is to provide a railway draft rigging, including a coupler, a yoke connected to the coupler and movable therewith in draft, a shock absorbing mechanism disposed within the yoke, a rear stop means against which the shock absorbing mechanism is compressed in buff, and a key extending through the draft sills against which the shock absorbing mechanism is compressed in draft, wherein the key forms stop means for restricting the compression stroke of the mechanism in draft to less than in buff.

Another object of the invention is to provide a draft rigging of the character described in the preceding paragraph, wherein the shock absorbing mechanism is of the friction type, including a friction shell, sliding friction means cooperating with friction surfaces on the shell and spring means resisting movement of the friction means inwardly of the shell, the spring means comprising two sets of springs both of which are compressed in buff, and wherein the stop key extends through the friction shell and has spring follower means anchored thereto cooperating with one only of said sets of springs in draft, whereby movement of said friction means inwardly of the shell in draft is resisted by one of said sets of springs only.

Another object of the invention is to provide in a railway draft rigging, having longer travel in buff than in draft, means for maintaining alignment of the coupler and the parts of the rigging, including an aligning member receiving the butt of the coupler shank and to which the coupler shank is keyed.

Other and further 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 longitudinal sectional view through the underframe structure of a railway car, illustrating my improvements in connection therewith. Figure 2 is a longitudinal vertical sectional view corresponding substantially to the line 2—2 of Figure 1. Figure 3 is a rear elevational view of the friction shock absorbing mechanism employed in connection with my improved railway draft rigging, as disclosed in Figures 1 and 2. Figure 4 is a transverse vertical sectional view corresponding substantially to the line 4—4 of Figure 2. And Figure 5 is a horizontal sectional view through a modified form of shock absorbing mechanism involving my improvements.

Referring first to the embodiment of the invention illustrated in Figures 1 to 4, inclusive, 10—10 designate channel shaped center or draft sills of the railway car underframe structure, to which are secured cheek plates 11—11 having pairs of transversely aligned slots 12—12, 13—13 and 14—14. At the outer ends of the sills 10, the usual striking casting 15 is provided, the same having a carry iron 16 of well known form associated therewith. Rear stop means in the form of a filler casting 17 is provided between the sills, the same being fixed to the sills. The standard coupler of the draft rigging is indicated by 18, the head of the same being broken away.

My improved railway draft rigging, as illustrated in Figures 1 to 4, inclusive, comprises broadly a yoke A; an aligning member B; a rear follower C; a stop key D; and a friction shock absorbing mechanism E including a friction shell F, wedge G, shoes H—H', spring follower J, intermediate follower K, wedge anchoring means M and spring resistance means N.

The yoke A is of the horizontal type, having longitudinally disposed spaced side arms 19—19 connected by transverse rear end section 20. At the forward end, the yoke has the side arms thereof provided with aligned coupler key receiving slots 21—21. The yoke also has aligned key receiving slots 22—22 rearwardly of the slots 21—21, these slots serving to accommodate the stop key D as hereinafter more fully pointed out. The yoke A contains the shock absorbing mechanism E, the rear follower C and the aligning member B. The aligning member B comprises a relatively heavy transversely disposed plate-like section 23 having a forwardly extending shelf 24 formed integral therewith and slidingly supported on the carry iron 16, as clearly shown in Figure 2. The plate-like section 23 of the aligning member B

also has a forwardly projecting ledge 25 above the shelf 24, the ledge being spaced such a distance from the shelf as to accommodate the shank of the coupler therebetween and loosely fit the same. The shelf 24 and the ledge 25 are connected by spaced vertical side walls 26—26 between which the shank of the coupler is accommodated. The walls 26—26 have transversely aligned coupler key receiving slots 27—27.

The coupler 18 is connected to the aligning member B and the yoke by means of a coupler key 28 which extends through the slots 27—27 of the aligning member B and the slots 21—21 of the side arms of the yoke A, and has its outer ends slidingly accommodated in the slots 12—12 of the cheek plates of the draft sills. The slots of the aligning member through which the coupler key extends closely fit the key so that the aligning member moves in unison with the coupler. The slots 21—21 of the yoke are of such a length as to permit inward movement of the key with respect to the yoke. In the normal position of the parts, the coupler key 28 engages the front end walls of the slots 21—21 of the yoke so that the yoke will be pulled outwardly with the coupler during a draft action. As will be seen upon reference to Figures 1 and 2, the parts are so proportioned that the butt of the coupler shank bears on the plate-like section 23 of the aligning member B and the buffing forces are thus transmitted directly from the coupler shank through the aligning member to the shock absorbing mechanism E of the draft rigging.

The shock absorbing mechanism E has the friction shell F thereof so disposed that the open end of the shell is directed rearwardly. In the present instance, the shell of the friction shock absorbing mechanism is shown as of rectangular cross section. The top and bottom walls of the friction shell F, as shown in Figure 2, are provided with liners 29—29 at the open end of the shell. The liners are preferably provided with friction surfaces of V-shaped section, as shown in Figure 3. The liners 29—29 are anchored to the shell against lengthwise displacement, the inner faces of the walls being provided with seats 30—30 receiving enlargements 31—31 on the liners 29—29. Two friction shoes H—H' are provided which have V-shaped friction surfaces on the outer sides cooperating with the friction surfaces of the liners 29—29. Each shoe has a lateral inwardly projecting enlargement provided with a wedge face 32. As shown, the wedge faces 32—32 of the two shoes are also of V-shaped section and the wedge face 32 of the shoe H' is disposed at a keener angle with respect to the longitudinal axis of the mechanism than the wedge face 32 of the shoe H. The wedge G has a pair of wedge faces 33—33 at opposite sides thereof which cooperate with the wedge faces 32—32 of the shoes H and H', the engaging wedge faces 33—33 of the wedge block G being correspondingly inclined to the cooperating faces of the shoes, and also being of V-shaped section so as to interfit with the same.

The friction shell F contains the spring resistance N which, as shown, comprises front and rear sets of springs 34 and 35. Each set of springs preferably comprises an upper and a lower coil, as clearly shown in Figure 2. The coils of the spring resistance 34 bear at their front ends on the front end wall of the friction shell F, and the members of the rear spring 35 bear at the rear ends on the spring follower J which is interposed between the same and the friction shoes H and H'. The spring follower J comprises a rectangular plate-like section bearing at the top and bottom ends on the inner ends of the liners 29—29. The plate is provided with a rearwardly projecting central portion 36 which normally engages the inner ends of the enlargements of the friction shoes. The follower J is also provided with a central stem 37 which extends through an opening 38 provided in the wedge block G. This is for the purpose of holding the wedge in correct alignment, the wedge being very top heavy at the back end due to the amount of its overhang with respect to the friction shell. The wedge block G is anchored to the follower J by the anchoring means M, which includes the anchoring bolt 39 extending through the stem 37 and into a recess 40 provided at the outer end portion of the wedge block. The head of the bolt which is disposed at the forward end thereof is seated in a recess 41 provided in the plate-like section of the spring follower J and a nut 42 at the inner end of the bolt bears on a follower disc 43 which in turn bears on a relatively short spring 44. A follower disc 45 is interposed between the spring 44 and an annular shoulder 46 provided by the enlarged opening in the wedge block which forms the recess 40. This spring resistance means is provided to allow for creeping or extension of wedge and shoes in the compression in tapered cylinder.

The stop key D which serves to hold the friction shell F against movement in draft extends through aligned slots 47—47 provided in the side walls of the shell and the slots 22—22 of the side arms of the yoke and has its outer ends slidingly supported in the slots 14—14 of the cheek plates. In the normal position of the parts, that is when the mechanism is in full release, the rear edge of the key D engages the rear end walls of the slots 47—47 of the shell F. At the same time, the front edge of the key D bears on the front end walls of the slots 22—22 of the yoke and the slots 14—14 of the cheek plates. As clearly shown in Figure 1, the slots 14—14 of the cheek plates are of such a length as to permit rearward movement of the key D therein during a buffing action. The slots 47—47 of the shell F are of such a length that rearward movement of the shell with respect to the key D is had during a buffing action. During a draft action, the yoke is movable forwardly with respect to the key D, the slots 22—22 of the yoke being of sufficient length to permit such action.

The intermediate follower K comprises a plate-like section 48 which is interposed between the front and rear sets of springs of the spring resistance means N, as clearly shown in Figure 2. The plate-like section 48 of the intermediate follower K is anchored to the stop key D by means of side members in the form of arms 49—49 through which the key D extends. The side arms 49—49 are provided with slots 50—50 which accommodate the key D, said slots 50 being closed at the rear end and open at the forward end. The plate-like section 48 is horizontally divided, as indicated at 51, to accommodate the key D, as clearly shown in Figure 2. In the normal position of the parts, the rear edge of the key D is engaged by the rear end walls of the slots 50—50 of the side arms 49—49, thereby holding the follower plate 48 against forward movement. As will be seen, the intermediate follower K forms a stirrup member anchored to the key D and a stop means for the front end of the

rear set of springs 35—35 of the spring resistance N.

The rear follower C is interposed between the rear end of the wedge block G and the transverse section 20 of the yoke A. As will be evident, the yoke and wedge block may be so designed that the wedge bears directly on the rear end section of the yoke, thereby eliminating the use of the rear follower C.

The operation of my improved railway draft rigging as illustrated in Figures 1 to 4, inclusive, during a buffing action, is as follows: Upon inward movement of the coupler 18, the aligning member B will be forced rearwardly therewith, thereby compressing the friction shock absorbing mechanism E between the aligning member B and the rear stop 17. During this action, the coupler 18 and the aligning member B are moved inwardly with respect to the yoke, this action being permitted by the elongated coupler key slots 21—21 in the side arms of the yoke. During the buffing action, the friction shell F will be forced rearwardly, while the wedge G is held against movement by engagement with the rear follower C. The friction shoes H and H' will thus be forced to slide on the friction surfaces of the shell against the resistance of the springs 34 and 35. The necessary spreading action to provide the required amount of friction is had through the wedge engagement of the block G with the shoes H and H'. During the buffing action, both sets of springs 34 and 35 will be compressed, movement of the intermediate follower K being permitted with respect to the key D by the slotted engagement of the follower with said key. During the rearward movement of the friction shell F in buff, the front end walls of the slots 47—47 of the shell will engage the key D, whereupon the key will be moved rearwardly in unison with the shell and moved rearwardly with respect to the yoke and sills 10—10, this movement being permitted by the length of the slots 22—22 of the yoke and 14—14 of the sills. The compression stroke in buff is limited by engagement of the open end of the friction casing or shell F with the rear follower C. The parts are preferably so proportioned that the rear edge of the key D will engage the rear end walls of the slots of the yoke and sills at the same time that the shell engages the follower C

When a draft action is applied to the coupler 18, the same will pull the yoke outwardly in unison therewith, thereby moving the rear follower C forwardly and forcing the wedge G and the friction shoes H and H' inwardly of the friction shell. Inasmuch as the rear edge of the key D bears on the rear end walls of the slots 47—47 of the friction shell F, and the key D is held against movement by engagement with the front end walls of the slots 14—14 of the sills, the friction shell will be held against movement during the entire draft action. The necessary forward movement of the yoke and rear follower C to provide the required draft stroke of the mechanism is permitted by the slots 22—22 in the side arms of the yoke. As the intermediate follower K is held against movement forwardly by the key D, the set of springs 35—35 only will be compressed during the draft action, the set of springs 34—34 remaining inactive at this time. The draft stroke of the rigging is limited by engagement of the rear end walls of the slots 22—22 of the yoke arms with the rear edge of the key D. As will be clearly seen, the amount of draft movement of the rigging is thus considerably less than the buffing movement, the draft movement being restricted by the length of the slots 22—22 of the yoke while the buffing stroke includes in addition the movement permitted by the length of the slots 47—47 of the friction shell F.

As clearly shown in Figures 1 and 2, the shelf 24 of the aligning member B normally projects outwardly beyond the carry iron 16 and supports the shank of the coupler closely adjacent to the head thereof. The extent to which the shelf 24 projects forwardly of the carry iron 16 is such that the shelf will be supported on the carry iron when the coupler is moved inwardly to the full extent of the buffing stroke of the mechanism. As will be evident, the coupler is thus adequately supported at all times during the operation of the draft rigging, the overhanging ledge 25 of the aligning member, which engages the upper side of the rear end of the shank, preventing upward tipping of the shank end and objectionable drooping of the coupler head.

The improved wedge anchoring means M, including the cushioning spring 44, prevents damage to the anchoring bolt for the wedge, sudden shocks due to recoil of the spring resistance N being effectively absorbed thereby. As shown most clearly in Figures 1 and 2, the front end of the stem of the follower J is normally spaced from the inner spring follower disc 45 of the wedge anchoring means M, this clearance being provided to compensate for creeping and wear of the cooperating friction and wedge faces of the friction means.

Referring next to the embodiment of the invention illustrated in Figure 5, the arrangement is substantialy the same as that described in connection with Figures 1 to 4, inclusive, with the exception that a different form of friction shock absorbing mechanism is employed. In the arrangement shown in Figure 5, a single set of spring coils is employed instead of the two sets as shown in Figures 1 to 4, inclusive, and the intermediate spring follower is omitted. The friction shell, which is indicated by F in Figure 5, is substantially of rectangular cross section and has liners 29—29 anchored to the open rear end thereof, with which friction shoes H and H' cooperate, the friction shoes cooperating with a wedge G. All of these parts are substantially the same as those hereinbefore described. An anchoring means for the wedge is also employed, which is precisely the same as the means described in connection with Figures 1 to 4, inclusive, the same also being indicated by M. The side walls of the friction shell are slotted, as indicated at 47, and the stop key D extends therethrough. As will be understood, the key D is connected to the draft sills and the yoke member in precisely the same manner as the key D referred to in connection with Figures 1 to 4, inclusive. The spring resistance means, which is indicated by S, comprises upper and lower coils which are interposed between the spring follower J and the front end wall of the friction shelf F. In draft, the spring follower J is limited in its movement inwardly of the shell by engagement with the key D. When the friction shell F, as shown in Figure 5, is forced rearwardly in buff, the wedge G will be held against movement by the spring follower C, thus causing relative movement between the friction shoes and friction surfaces of the shell, such movement being resisted by the springs S—S. The additional movement in buff to provide the

desired longer stroke is had through relative movement of the friction shell F and the key D.

I have herein shown and described what I now consider the preferred manner of carrying out my invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a railway draft rigging, the combination with draft sills provided with aligned key slots; of a fixed rear stop; a coupler; a yoke connected to the coupler for movement therewith in draft; a rearwardly opening friction shell within the yoke; friction means at the open end of the shell having frictional engagement with the walls thereof; a wedge forming a part of the friction means and adapted to be pulled outwardly by the yoke in draft; a spring resistance within the shell opposing inward movement of said friction means; and a stop key extending through the shell and the slots of the sills for restricting movement of the friction means inwardly of the shell in draft to less than the relative movement of the shell and friction means in buff.

2. In a railway draft rigging, the combination with draft sills provided with aligned key slots; of a fixed rear stop; a coupler; a yoke connected to the coupler for movement therewith in draft; a rearwardly opening friction shell within the yoke; friction means at the open end of the shell having frictional engagement with the walls thereof; a wedge forming a part of the friction means and adapted to be pulled outwardly by the yoke in draft; a spring resistance within the shell opposing inward movement of said friction means; a spring follower interposed between the spring resistance and friction means; and a stop key extending through the shell and sills held against movement in draft and engaged by said spring follower in draft to restrict movement of the friction means inwardly of the shell to less than the relative movement of the shell and friction means in buff.

3. In a railway draft rigging, the combination with draft sills provided with aligned key slots; of a fixed rear stop; a coupler; a slotted yoke connected to the coupler for movement therewith in draft; a friction shell within the yoke, said shell being closed at the front end and open at the rear end, said shell having the side walls thereof provided with aligned, longitudinally extending slots, said shell being moved rearwardly by the coupler in buff; friction means at the open end of the shell having frictional engagement with the walls thereof; a wedge forming a part of the friction means and adapted to be pulled outwardly by the yoke in draft; a spring resistance within the shell opposing inward movement of said friction means; and a stop key extending through the slots of the shell, yoke, and sills, and slidingly fitting said slots, said stop key being held against movement in draft and having shouldered engagement with the shell to hold the same against movement in draft, said shell being movable with respect to the key in buff and said key being movable with respect to the yoke and sills in buff, said yoke being movable with respect to the key in draft and having shouldered engagement with the key in draft to limit the stroke of the rigging to less than the stroke in buff.

4. In a railway draft rigging, the combination with draft sills provided with aligned key slots; of a fixed rear stop; a coupler; a yoke connected to the coupler for movement therewith in draft; a rearwardly opening friction shell within the yoke; friction means cooperating with the open end of the shell and having sliding frictional engagement with the walls thereof; front and rear spring resistance elements within the shell; a stop key extending through the shell and held against outward movement in draft, said key being movable inwardly in buff; an intermediate spring follower between the front and rear spring elements, said spring follower being fixed to the key, said stop key restricting movement of the friction means inwardly of the shell in draft to less than the relative movement of the shell and friction means in buff.

5. In a railway draft rigging, the combination with draft sills provided with aligned key slots; of a fixed rear stop; a coupler; a yoke connected to the coupler for movement therewith in draft; a rearwardly opening friction shell within the yoke; friction means cooperating with the open end of the shell and having sliding frictional engagement with the walls thereof; front and rear spring resistance elements within the shell; a stop key extending through the shell and held against outward movement in draft, said key being movable inwardly in buff; an intermediate spring follower between the front and rear spring elements, said spring follower being fixed to the key, and a second spring follower interposed between the rear spring and the friction means and engaging the stop key in draft to restrict the movement of the friction means inwardly of the shell in draft to less than the movement of the shell and friction means in buff.

6. In a railway draft rigging, the combination with draft sills having aligned key slots; a coupler; a yoke keyed to the coupler, said yoke being movable with the coupler in draft and the coupler being movable with respect to the yoke in buff; rear stop means on the sills engageable by the inner end of the yoke; a rearwardly opening friction shell within the yoke; friction shoes slidably engaging the interior walls at the open end of the shell; a block having wedging engagement with the shoes; a rear follower interposed between said block and the rear end section of the yoke; spring resistance means within the shell comprising front and rear spring elements, said front and rear spring elements opposing relative movement of the shell and shoes in buff; a stop key extending through the shell, yoke and slots of the sills, said key being held against movement in draft and having shouldered engagement with the shell to hold the same against outward movement, said key being movable rearwardly with respect to the sills and said shell being movable rearwardly with respect to the key in buff; and an intermediate spring follower fixed to the key and disposed between said front and rear spring elements and forming a fixed abutment for said rear spring element during the draft action.

7. In a railway draft rigging having a longer compression stroke in buff than in draft, the combination with a coupler; a yoke having a keyed connection with the coupler, said coupler being movable inwardly of the yoke in buff; a fixed support outwardly of the keyed connection between the coupler and yoke; shock absorbing mechanism within the yoke; and an aligning member having side walls embracing the coupler shank, a bottom wall on which the shank is supported, a vertical inner end wall against which the butt of the coupler shank bears, and a ledge forwardly projecting from said end wall and en-

gaging over the butt end of the shank, said aligning member being fixed to the coupler shank for movement in unison therewith by means of said key connection which extends through said side walls, said bottom wall being slidably supported on the fixed support and engaging and supporting the coupler shank outwardly of the keyed connection thereof with the yoke.

8. In a railway draft rigging, the combination with draft sills having aligned key slots; of a coupler; a yoke keyed to the coupler, said yoke being movable with the coupler in draft and the coupler being movable with respect to the yoke in buff, said yoke having transversely aligned, longitudinal guide slots; rear stop means on the sills engageable by the inner end of the yoke; a friction shell within the yoke, said shell being open at the rear end and closed at the forward end, said closed end directly receiving the actuating force from the coupler in buff, said shell having longitudinally extending slots in the side walls thereof; friction shoes slidably engaging the interior walls at the open end of the shell; a block having wedging engagement with the shoes; a rear follower interposed between said block and the rear end section of the yoke; spring means within the shell opposing inward movement of the shoes; and a stop key limiting movement of the friction shoes and wedge block with respect to the shell in draft to an amount less than the relative movement of the shoes and wedge with respect to the shell in buff, said key extending through the slots of the shell, yoke, and sills, said key being of lesser dimension lengthwise of the mechanism than said slots, said key normally engaging the front walls of the slots of the sills and yoke and the rear walls of the slots of the shell to hold said shell stationary in draft.

JOHN F. O'CONNOR.