F. M. SNYDER.

FRICTION DRAW GEAR.

APPLICATION FILED JULY 21, 1909.

970,131. Patented Sept. 13, 1910.

Fig. 1.

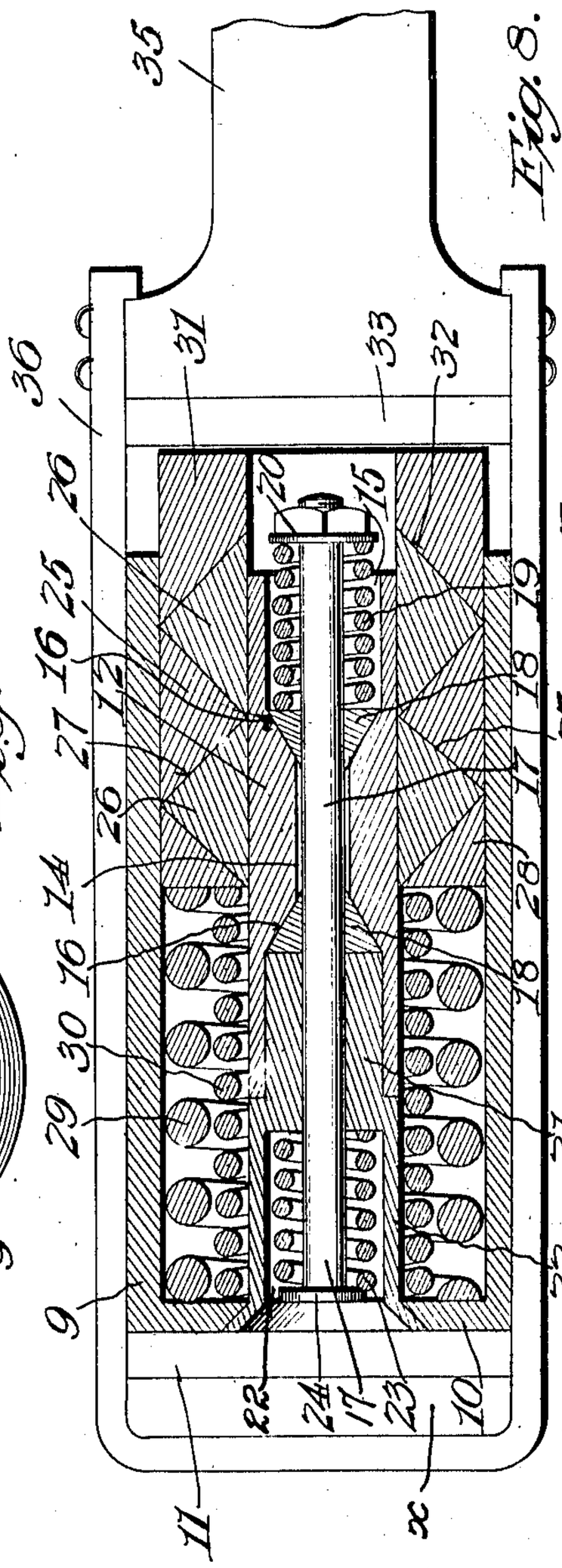

Fig. 2.

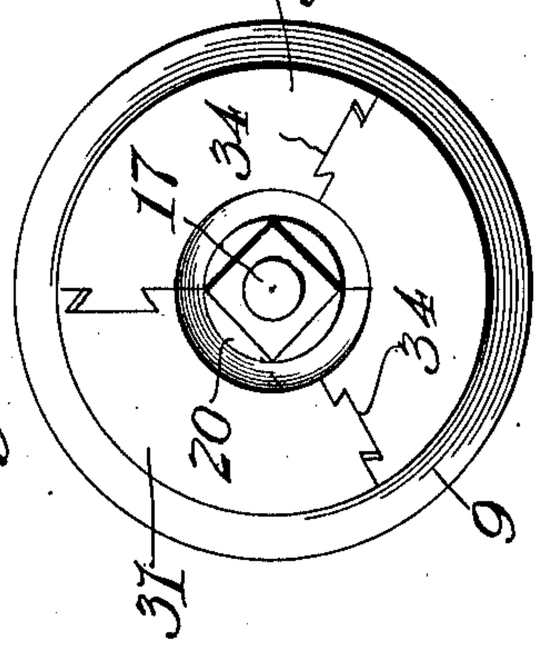

Fig. 3.

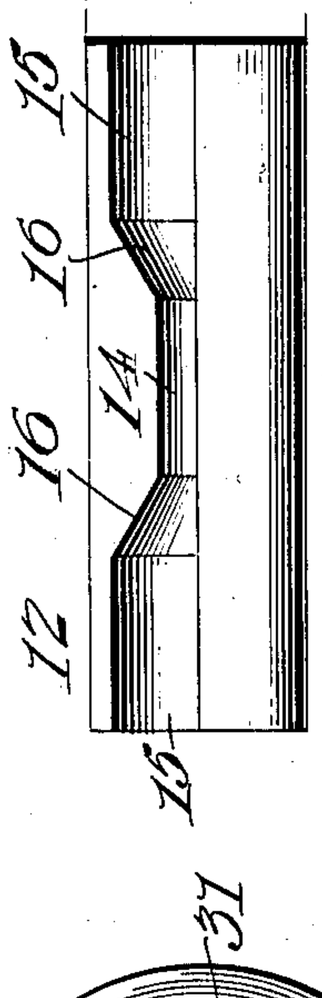

Fig. 4.

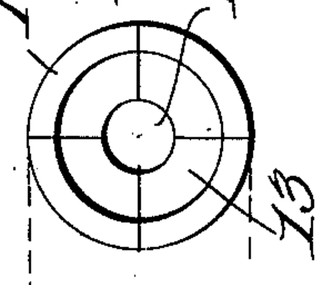

Fig. 5.

Fig. 6.

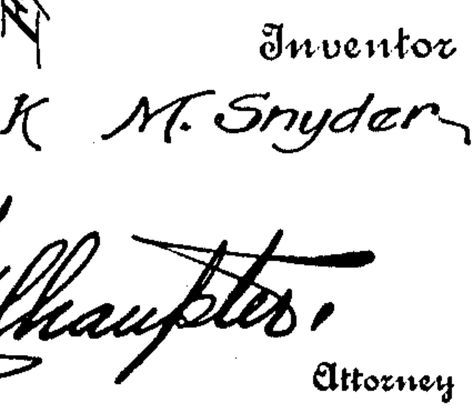

Fig. 7.

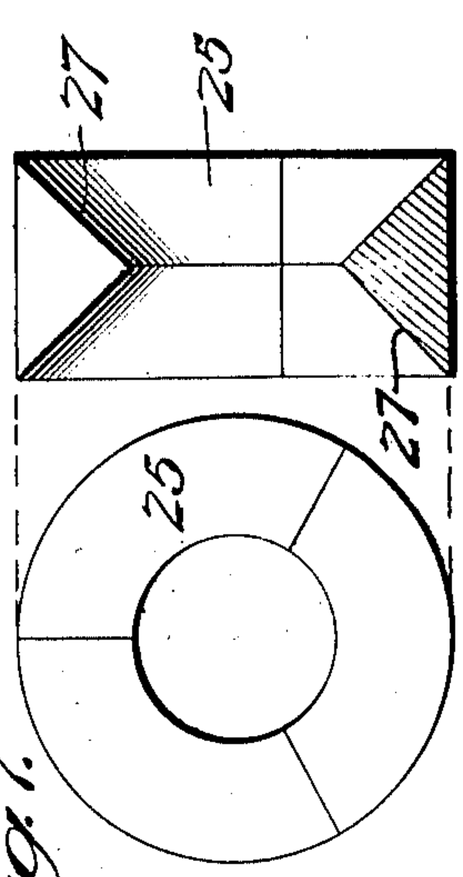

Fig. 8.

Witnesses

T. L. Mochrie

Emory Lowell Groff.

Inventor

Frank M. Snyder

By A. Wolhaupter.

Attorney

UNITED STATES PATENT OFFICE.

FRANK M. SNYDER, OF CRESSON, PENNSYLVANIA.

FRICTION DRAW-GEAR.

970,131. Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed July 21, 1909. Serial No. 508,849.

To all whom it may concern:

Be it known that I, FRANK M. SNYDER, a citizen of the United States, residing at Cresson, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Friction Draw-Gears, of which the following is a specification.

The present invention relates to draw gears for railway or motor cars and other structures, and the object is to provide an exceedingly compact mechanism which produces an enormous amount of frictional resistance to the movement of a draw-bar, said resistance increasing in proportion to the increase in the amount of movement of the draw bar.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a longitudinal sectional view through the structure illustrating a part of the draw gear. Fig. 2 is a front end view of the same, with the draw gear removed. Fig. 3 is a side elevation of the core with one of the sections thereof removed. Fig. 4 is an end view of the said core. Fig. 5 is a detail sectional view through one of the compressible friction rings. Fig. 6 is an end view of the same. Fig. 7 is an end view of one of the expansible rings. Fig. 8 is a sectional view therethrough.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, a tubular, and preferably cylindrical friction case 9 is employed, the rear end 10 of which abuts against the usual stationary follower block 11 of a draft gear, and in practice a filling block *x* fills the space between said block 11 and one end of the yoke 36 hereinafter referred to. The other end of the friction case is open. Arranged longitudinally and centrally within this friction case is an expansible core 12, which, as illustrated in Figs. 3 and 4, is composed of a series of sections 13. This core has a central bore 14 and end counterbores 15, the inner terminals of which are tapered, as shown at 16. A bolt 17 extends longitudinally through the bore and counterbores, and supports a pair of reversely disposed friction-producing cones 18 that bear against the tapered walls 16 of the counterbores. A coiled spring 19, arranged upon one end of the bolt 17, bears against the adjacent cone 18, and also against a suitable nut and washer 20 threaded upon the bolt. A supporting plug 21 bears against the outer end of the other cone 18, and has its outer portion formed into a casing 22 that receives another coiled spring 23. This spring 23 bears against the casing and against the head 24 of the bolt and acts as a balancing or equalizing means for the companion spring 19.

Surrounding the core and arranged within the casing, are a series of coacting expansible and compressible sectional rings, designated respectively 25 and 26, all of these rings, as shown in Figs. 5—8 inclusive, being formed of sections, said rings having complemental inclined faces 27 that slidably bear against each other. An inner expansible sectional ring 28 disposed at the inner end of the series, has a right angularly disposed inner face, against which the buffer springs 29 and 30 bear, these springs surrounding the core, and also bearing against the inner end wall of the friction case. An outer sectional ring 31 is employed at the outer end of the series, and has an inclined rear face 32 that coöperates with the adjacent inclined face of the associated compressible ring 26. The movable follower plate 33 of the draw gear is arranged to abut against the outer end of the ring 31, and also against the adjacent end of the bolt 17, if sufficient movement is given to the draw gear. The ring 31, as illustrated more particularly in Fig. 2, is made of sections, which are loosely dovetailed together, as shown at 34, so that this ring can expand against the case 9. A portion only of the draw gear is illustrated, the said portion consisting of a part of the draw bar, which is designated 35, and to which is secured the end of the draw gear yoke 36, said yoke being disposed longitudinally of and surrounding the friction case 9.

The operation of the structure is substantially as follows. Upon the inward movement of the draw gear, the follower plate 33 will strike the outermost ring 31, and inasmuch as the sections of the compressible rings are separated, said sections will be forced inwardly into frictional engagement with the core 12, while the friction rings 31, 25 and 28 will be expanded and forced into frictional engagement with the casing 9. These various operations, as will be obvious, produce a great amount of frictional resist-

ance to the movement of the draw bar, which resistance will be increased in proportion to the amount of movement of said draw bar. When the draw bar moves far enough to cause the follower 33 to strike the end of the bolt 17, the spring 19 will be strongly compressed and the cone 18 engaged thereby will be forced inwardly, thus expanding the core 12 and securing additional friction. It will thus be seen that in the operation of the rigging a most powerful frictional buffer action is accomplished by reason of the opposing movements of the central expansible core 12 and of the sectional compressible rings 26. In this connection it will be observed that the inward longitudinal thrust of the yoke not only serves to expand the elements 31, 25 and 28 outward into frictional engagement with the casing 9, but also causes the compression elements or sectional rings 26—26 to be compressed about and upon the core 12, while at the same time, when the follower 33 reaches one end of the bolt 17 and moves the latter longitudinally, with the result of placing the spring 19 under great compression, the central core is caused to expand or tend to expand with the result of greatly increasing the frictional resistance offered by the parts to the inward movement of the draw bar and the yoke carried thereby.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a friction draw gear, the combination with the draw bar, of a friction mechanism including an internal, sectional expansible core, a core expanding device located within the core, means for yieldingly resisting movement of said device, and a plurality of sectional ring wedges operated by movement of the draw bar and arranged to encircle and grip the core.

2. In a friction draw gear, the combination with the draw bar, of a friction mechanism comprising an expansible core, a core expanding device movable longitudinally within the core, and a plurality of sectional rings wedging one upon the other and arranged to encircle and grip the core.

3. In a friction draw gear, the combination with the draw bar, of a friction mechanism comprising a friction case, a central expansible core, core expanding means operated upon movement of the draw bar, and alternating compression and expansion devices arranged side by side and encircling the core between the latter and the friction case, said devices being also operated upon movement of the draw bar.

4. In a friction draw gear, the combination with the draw bar, of a friction mechanism comprising a friction case, a central expansible core, core expanding means operated upon movement of the draw bar, and alternating compression and expansion devices in the form of sectional rings wedging one upon the other and encircling the core between the latter and the friction case, said devices being also operated upon movement of the draw bar.

5. In a structure of the character set forth, the combination with an expansible core formed of sections and having a central bore and tapered counterbores, of a draw-bar-operated bolt passing through the bores, cones arranged on the bolt and bearing against the tapered walls of the counterbores, springs located on the bolt a compressible sectional friction ring surrounding the core, a draw gear having a yoke disposed longitudinally of and surrounding the core, and means operated by the draw gear for compressing the ring.

6. In a structure of the character set forth, the combination with a tubular friction case, of a core disposed centrally and longitudinally within the same, and comprising sections that permit the expansion of the core, said core having a central bore and tapering counterbores, a bolt passing through the bore and counterbores, cones located on the bolt and bearing against the tapered walls of the counterbores, coiled springs on the bolt, a series of sectional friction rings surrounding the cores within the case, the alternate rings being respectively expansible and contractible and having complemental inclined faces, buffer springs arranged within the case around the cores and bearing against the innermost rings, a draw gear having a draw gear yoke arranged longitudinally of and surrounding the case, and a follower arranged within the yoke and bearing against the outermost ring.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

FRANK M. SNYDER.

Witnesses:
J. W. HEUCH,
JOHN L. HERR.