

J. D. FETZER.  
UNIVERSAL JOINT.  
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1,128,430.

Patented Feb. 16, 1915.

Fig. 1.

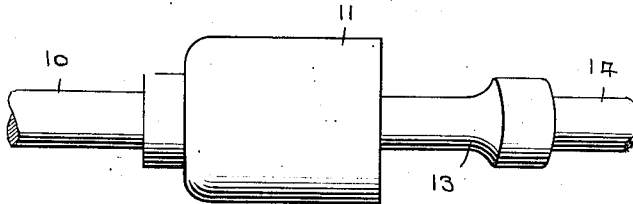


Fig. 2.

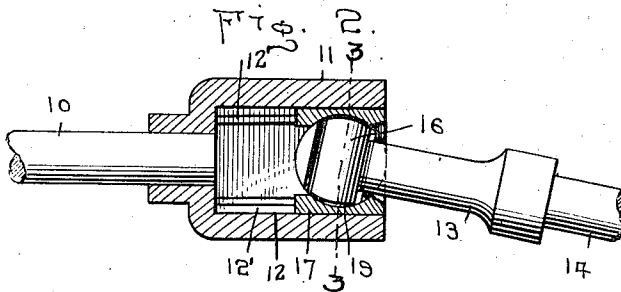


Fig. 5.

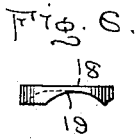
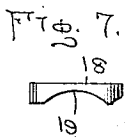
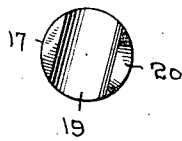


Fig. 4.

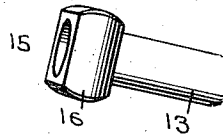


Fig. 3.

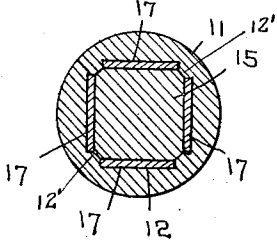
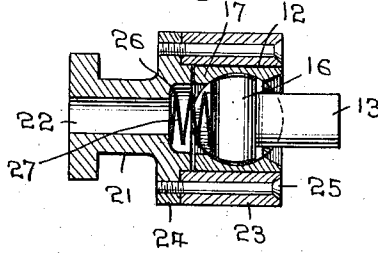


Fig. 8.



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# UNITED STATES PATENT OFFICE.

JAMES DAVID FETZER, OF COLUMBUS, OHIO.

## UNIVERSAL JOINT.

1,128,430.

Specification of Letters Patent.

Patented Feb. 16, 1915.

Application filed November 13, 1913. Serial No. 800,814.

*To all whom it may concern:*

Be it known that I, JAMES DAVID FETZER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Universal Joints; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to joints, and more particularly to combined universal and slide joints.

One object of the invention is to provide a joint wherein the parts are so constructed and arranged as to greatly increase the area of bearing surface, thus insuring against quick wearing of the parts and the consequent lost motion between them.

Another object of this invention is the construction of means within the joint for preventing the lateral movements of the sliding parts therein for avoiding the consequent danger of the parts becoming locked together, as well as to provide for the positive and more efficient connections between the same for facilitating the rotation of certain of the parts by the others.

In the accompanying drawing, wherein is shown an approved and practical embodiment of the invention, Figure 1 represents a side elevation of the complete joint, Fig. 2 represents a similar view partly in section, Fig. 3 represents a sectional view on the line 3-3 of Fig. 2, Fig. 4 represents a perspective view of the head and shank of the joint, Fig. 5 represents a plan view of one of the bearing disks or blocks for the head, Figs. 6 and 7 represent side elevations at two different angles of the block, and, Fig. 8 represents a longitudinal sectional view through a slightly modified form of joint.

Referring to the drawing in detail, wherein similar reference numerals designate corresponding parts throughout the several views, 10 indicates a shaft suitably fixed in one end of the box 11, the opposite end of which is formed with a rectangular opening 12. At each of the corners of the opening 12 and extending longitudinally thereat are formed the retaining and spacing ribs 12'. The inner surfaces of the walls of the opening 12 and the surfaces of the ribs 12' are ground and finished to provide smooth bearing surfaces for the slidable parts of the

joint hereinafter described. A shank 13 is suitably fixed on the end of a second shaft 14, which is to be rotatably connected with the shaft 10, and carries at its free end a rectangular head 15. As clearly shown in Fig. 4, the four bearing faces 16 of the head are rounded and positioned within the opening 12 of the box.

A plurality of bearing blocks 17 are positioned within the opening 12 between the four walls of the latter and the four faces 16 of the head. The back or outer face 18 of each block 17 is plane and in slidable contact with one wall of the opening 12 between the spacing ribs 12' at each side thereof, the edges of the blocks 17 being in slidable contact with the side walls of the ribs 12', and the inner faces of said blocks are formed with diametrical channels 19, shaped in conformity and slidably contacting with the rounded faces 16 of the head 15. The wall of the channel 19 of each block adjacent the shank 13 is cut away at 20 so as not to obstruct the movement of said shank. As stated, a bearing block 17 is disposed between each bearing face 16 of the head and each wall of the rectangular opening 12 between the spacing ribs 12' and substantially the entire area of each face 16 contacts with the wall of its channel 19 and thus a great area of bearing surface is provided between the head and the bearing blocks, and also between the walls of the opening 12 and the plane outer faces 18 of the bearing blocks.

The blocks 17 together with the heads 15 may be moved longitudinally within the box 11, but owing to the construction and arrangement of these parts they are prevented from relative independent rotation. The formation of the retaining and spacing ribs 12' at each of the corners of the rectangular opening 12 provides for the longitudinal movement of the bearing blocks 17, but prevents any lateral movement of the same, and by thus retaining the contiguous edges of the blocks in spaced relation, the dangerous results from the cramping and locking of the edges of the blocks at the corners of the openings is obviated. The further purposes of the ribs 12' is to provide bearing surfaces for the edges of the bearing blocks 17 for the more positive and efficient rotation of the joint.

In the modification illustrated in Fig. 8, the box is formed in two parts consisting essentially of a sleeve member 21 having a

bore 22 adapted to receive a shaft, and a body or box 23 secured to the flange 24 of the sleeve by suitable bolts 25. The end of the sleeve 21 abutting the box 23 is provided with a boss 26, received within a suitable opening in the box for insuring that these parts are accurately assembled. In this modification of the invention a spring 27 is preferably provided and positioned between the inner end of the opening 12 and the head 15 as clearly shown in Fig. 8.

What I claim as new is:

1. A universal joint comprising a box having a rectangular opening therein, a shank; a head on said shank positioned within said opening, a plurality of circular bearing blocks disposed between said head and the walls of said opening, and ribs within said box for retaining the edges of said blocks in spaced relation upon the walls of said opening for preventing contact of the edges of said blocks with each other.

2. A universal joint comprising a box having a rectangular opening therein, a shank, a head on said shank positioned within said opening, a plurality of circular bearing blocks disposed between said head and the walls of said opening, and spacing ribs formed at the corners of said rectangular opening for retaining the edges of said blocks in spaced relation, and also providing bearing surfaces for the edges of said blocks.

3. A universal joint comprising a box having a rectangular opening therein, a shank, a head on said shank positioned within said opening, said head having rounded sides, a

plurality of circular bearing blocks disposed between said head and the walls of said opening and each block having its respective surfaces shaped in conformity with said head and said walls, and longitudinally extending ribs formed at the corners of said rectangular opening for retaining said blocks in spaced relation for preventing the interlocking of said blocks, and also providing bearing surfaces for said blocks for the more efficient rotation of the joint.

4. A universal joint comprising a shafting, a boxing mounted upon said shafting having a rectangular bore therein with spacing ribs in the corners of the walls thereof, a second shafting, a shank sleeved upon said second shafting having a plurality of circular-like bearing faces and with a recess in the head thereof, a plurality of bearing blocks, each slidably mounted between one of the bearing faces and one of the walls of said boxing, the adjacent edges of said blocks abutting the said spacing ribs, and resilient means mounted between the inclosed end of the boxing and the head of the shank, one end of said resilient means being seated in said recess in said shank adapted to compensate for end thrust.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES DAVID FETZER.

Witnesses:

GRACE FETZER,  
HOWARD FETZER.