

(No Model.)

W. B. WILCOX.  
CHAIN PUMP BUCKET.

No. 322,874.

Patented July 21, 1885.

Fig. 1.

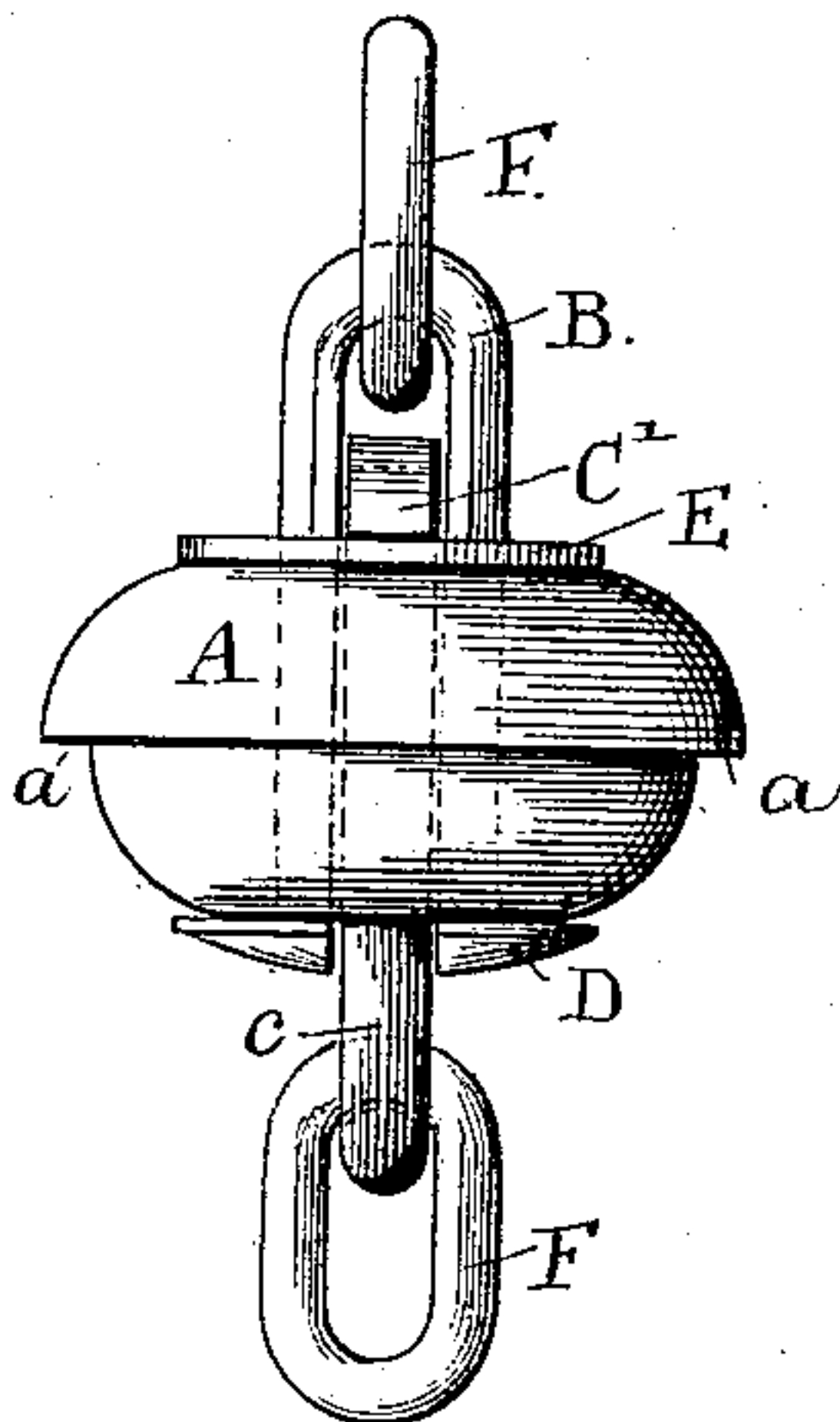


Fig. 2.

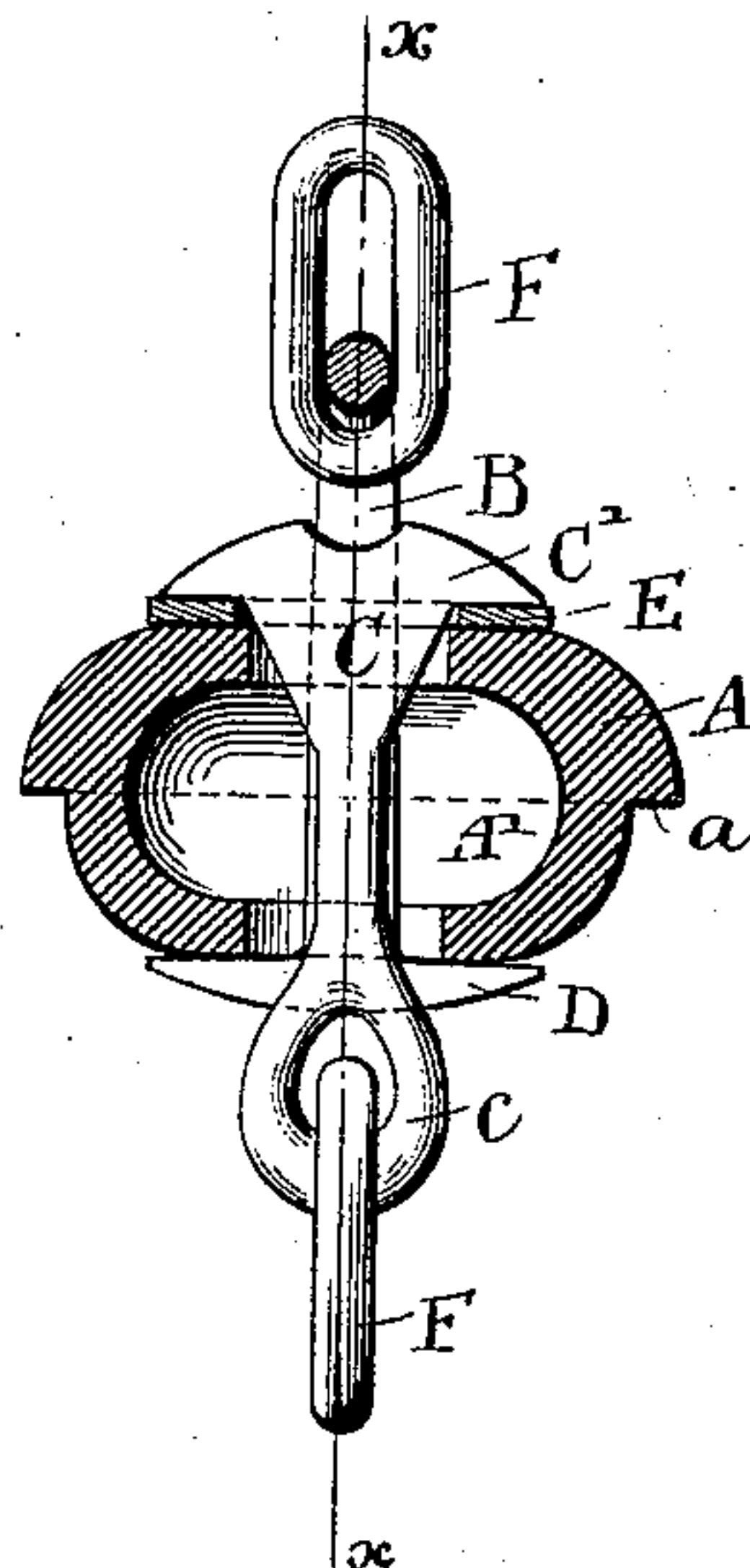


Fig. 3.

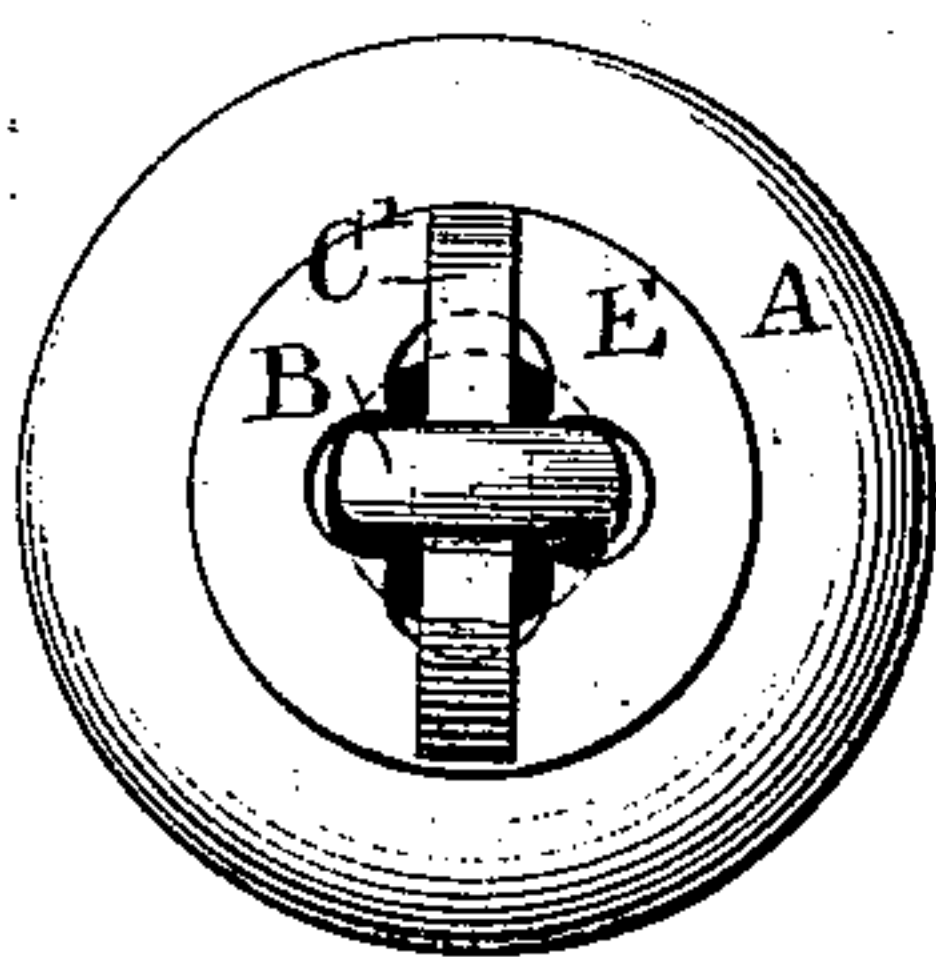
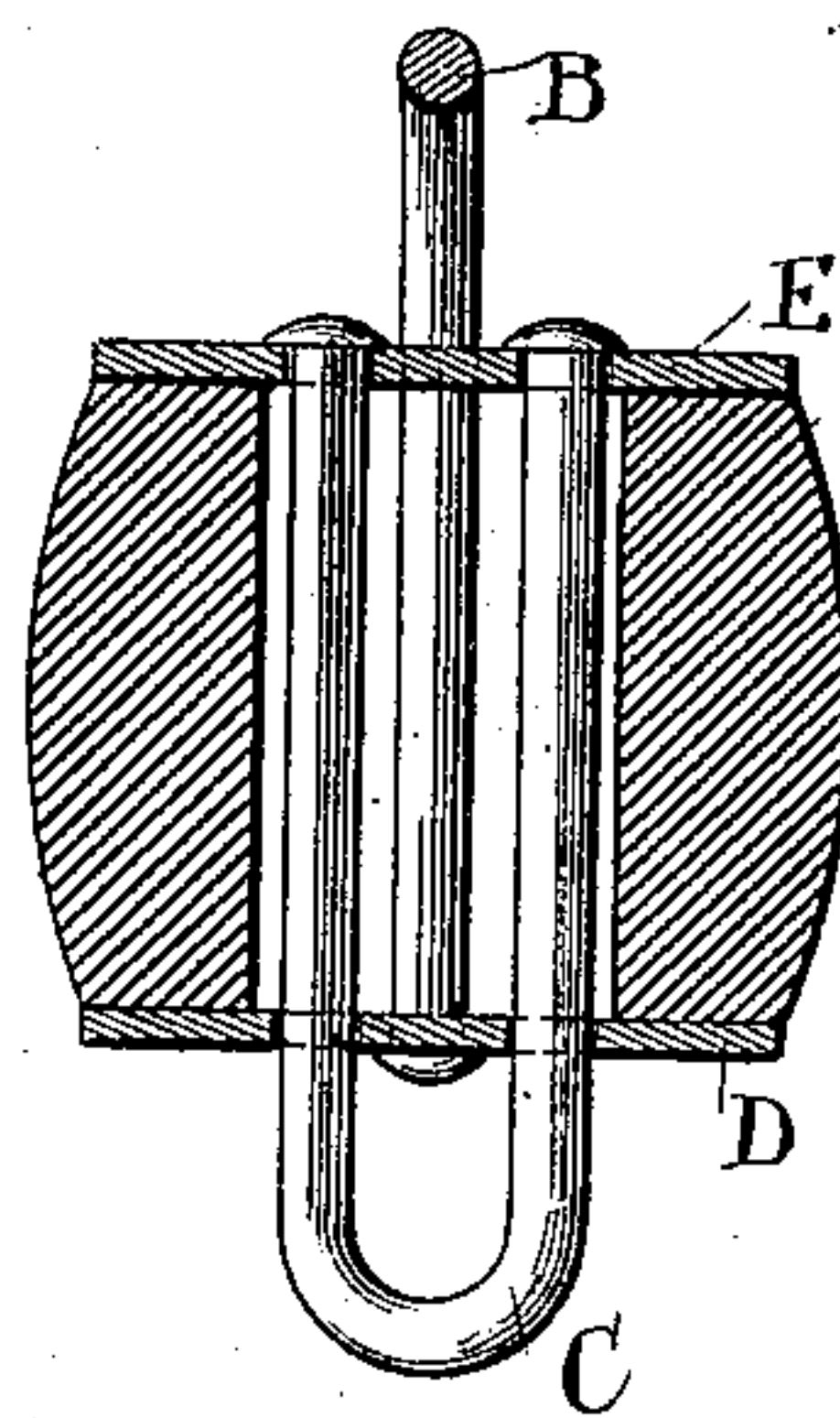


Fig. 4.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

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## CHAIN-PUMP BUCKET.

SPECIFICATION forming part of Letters Patent No. 322,874, dated July 21, 1885.

Application filed November 24, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. WILCOX, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Chain-Pump Buckets; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon,  
10 which form a part of this specification.

The object of this invention is to provide an improved construction in that class of chain-pump buckets having a flexible body or packing of rubber or similar material, whereby an  
15 increased pressure upon the bucket, tending to cause the leakage of water or air past it, will cause the lateral expansion of the packing, so that it will press upon or fit more tightly in the walls of the tube in which the bucket moves.  
20 The increased pressure mentioned will arise, in a pump that operates to lift the water, by an increase of weight due to the presence of a relatively-high column of water in the pump barrel or tube, and in a suction-pump by the  
25 increase of the atmospheric pressure upon the bucket in drawing water to a considerable height. In both cases the increased pressure due to the increase of the work to be done or resistance to be overcome by the pump will  
30 cause an increased strain or tension upon the chain connecting the buckets. It is proposed in a device embodying this invention to utilize this increased tension or strain upon the chain as a means of expanding the buckets. For this  
35 purpose the flexible packing which usually forms the main body of the bucket, instead of being secured to a single rigid bar or link forming one of the links of the chain, is connected with the chain by two separate bars or  
40 links, both of which pass through the said ring, and are connected with disks or bearing-rings located in contact with the packing-ring at its upper and lower sides, the said links being connected with the connecting-chain at  
45 their ends opposite their points of connection with the said disks, so that when a strain is brought upon the chain the disks will be drawn toward each other and the packing-ring thereby depressed in the direction of its central  
50 axis and expanded or increased in diameter laterally. The flexible packing-ring will usually be made of rubber, and may be of any

shape found suitable for the purpose. As preferably constructed, and shown in one form of bucket illustrated in the accompanying  
55 drawings, the packing is made relatively thick and centrally hollow, whereby a greater amount of lateral expansion is obtained under the same amount of compressive strain than when solid, or provided only with a central aperture for  
60 the passage of the connecting links. A preferred form of construction in the said connecting-links, whereby they may be easily and cheaply made and the parts readily placed together, is herein illustrated, and will be  
65 hereinafter described.

The invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a chain-pump  
70 bucket embodying my invention. Fig. 2 is a central axial section of the same, taken upon line *xx* of Fig. 1. Fig. 3 is a plan or top view of the bucket shown in Figs. 1 and 2. Fig. 4 is a central axial section illustrating a bucket  
75 differing somewhat in construction from that shown in the previously-mentioned figures.

As shown in the said drawings, A is the flexible body or packing-ring of the bucket, which is herein shown as of annular form or  
80 centrally apertured, and which is usually made of rubber. B and C are rods or links which are adapted for the attachment of the links or chains connecting the buckets, and both of which are inserted through the aperture of the  
85 packing-ring and connected, respectively, with two separate metal rings or disks, D and E, at their ends opposite those engaged with the said connecting chains or links.

The rings or disks D and E may be made  
90 separate from the rods or links B and C, and attached thereto in any suitable manner, or they may be made integral with the said rods or links, and in the form of lateral projections or flanges thereon, the essential feature of construction, as far as this part of the device is  
95 concerned, being projections upon or plates connected with the ends of the links adapted to engage the opposite sides of the packing, so that the latter will be compressed between said  
100 projections or plates when the said links are drawn in opposite directions.

The packing A may be in the form of a hollow ring, or it may be solid, the construction



first mentioned having the advantage that it will become expanded laterally or increased in diameter to a greater extent than a solid ring under the same compressive strain.

5 The hollow form of packing is illustrated in Fig. 2, in which an annular recess or concavity is formed in the ring A adjacent to the central aperture thereof.

The packing-ring shown in Figs. 1, 2, and 10 3 approximates an oblate spheroid in shape; but it may be more nearly spherical or of other shape, as found convenient or desirable in practice.

A desirable form of the device, which is so 15 constructed that the parts may be put readily together without the use of special fastening devices, is shown in Figs. 1, 2, and 3. In this case the link B is made of U shape, and the disk D is made in the form of outwardly-ex- 20 tending projections or flanges upon the disconnected ends of the link.

The link C is made of a single bar or rod hav- ing an eye, c, at one end for engagement with the link or chain connecting the buckets, and a 25 cross-bar, C', formed in one piece therewith at its opposite end, and adapted to engage an apertured disk or ring, E, placed against the packing-ring A opposite the disk D, the central aperture of said disk E, as shown in Fig. 30 3, being shaped to fit over the side bars of the link B, and to thereby hold the said disk from lateral displacement.

In placing together the parts constructed as above described the link B is first inserted 35 through the central aperture of the packing A, and the ring E is then placed over the link in contact with the packing. The lower or eye end of the link C is then inserted through the aper- 40 ture of the disk E and of the packing-ring, so as to bring the cross-bar C' in contact with the said disk. The parts are then in position for attachment of the chain or links connecting the buckets, two of said links being shown at F F, Figs. 1 and 2.

45 The bucket A is shown in Figs. 1 and 2 as provided with a marginal lip or flange, a, adapted to give flexibility to the packing at its line of contact with the walls of the pump-tube. Such lip or rim is not, however, essen- 50 tial, and in the modified form of bucket shown in Fig. 4 such flange is absent.

In the figure last mentioned the rubber packing is in the form of a plain annulus or ring having an outwardly-curved or convex 55 outer surface. As shown in said figure, also, the disks D and E are without central aper- tures, and the links B and C are both of U shape, and each of said links has its ends ex- 60 tended through suitable apertures in the plate D or E at one side of the packing and held by

suitable heads in the plate at the opposite side of the packing. The chains or links con- necting the buckets are attached to the said links B and C at their outer or loop ends, and the said links under the strain of the chains 65 operate to draw the disks D and E together and to thereby compress the packing in the same manner as before described in connec- tion with the form of bucket shown in Figs. 1, 2, and 3.

The important feature of novelty in my in- 70 vention consists in the employment of con- necting devices for attaching the flexible pack- ing to the chains or links uniting the buckets, which are so constructed that the packing will 75 be compressed when the chain is subjected to tension.

Other means than those herein shown as illustrating one way of carrying out my in- 80 vention may obviously be employed with the same results as above set forth; and my inven- tion as herein claimed is not, therefore, lim- ited to the devices herein shown, excepting in the claims in which said devices are spe- 85 cifically set forth, but is intended to cover, broadly, all devices for this purpose operating upon the general principle embodied in the devices herein illustrated and described.

I claim as my invention—

1. In a chain-pump bucket, the combina- 90 tion, with an elastic packing, of two disks or rings bearing upon opposite sides of the pack- ing, and two separate rods or links extending through the packing and each connected with a separate disk, substantially as and for the 95 purpose set forth.

2. In a chain-pump bucket, the combina- tion, with a hollow elastic body or packing, of two disks or rings bearing upon opposite 100 sides of the packing, and two separate links or rods for the attachment of the pump-chain, extending through the said packing and each connected with a separate disk or ring, sub- stantially as and for the purpose set forth.

3. In a chain-pump bucket, the combina- 105 tion, with a centrally-apertured flexible pack- ing, A, of a U-shaped bar or link, B, provided at one end with a disk or flange, D, adapted to bear upon the said packing, an apertured disk, E, opposed to the disk D, and a link, C, 110 provided with a cross-bar, C', engaged with the disk D, substantially as and for the pur- pose set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence 115 of two witnesses.

WILLIAM B. WILCOX.

Witnesses:

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OLIVER E. PAGIN.