No. 771,388. PATENTED OCT. 4, 1904.

F. A. NUSBAUM.

CLAMP FOR CLOSING LEAKS.

APPLICATION FILED JAN. 10, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

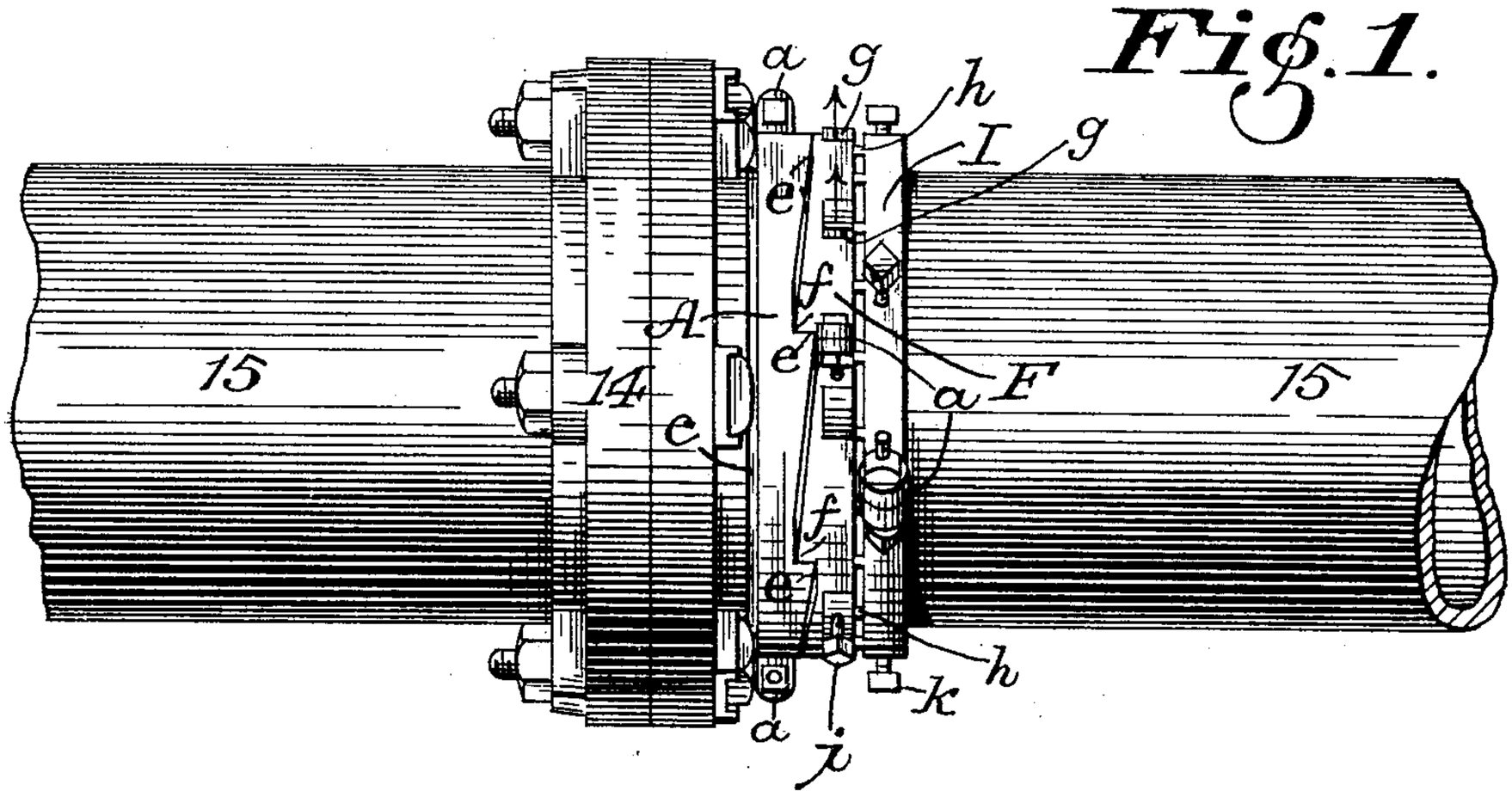


Fig. 2.

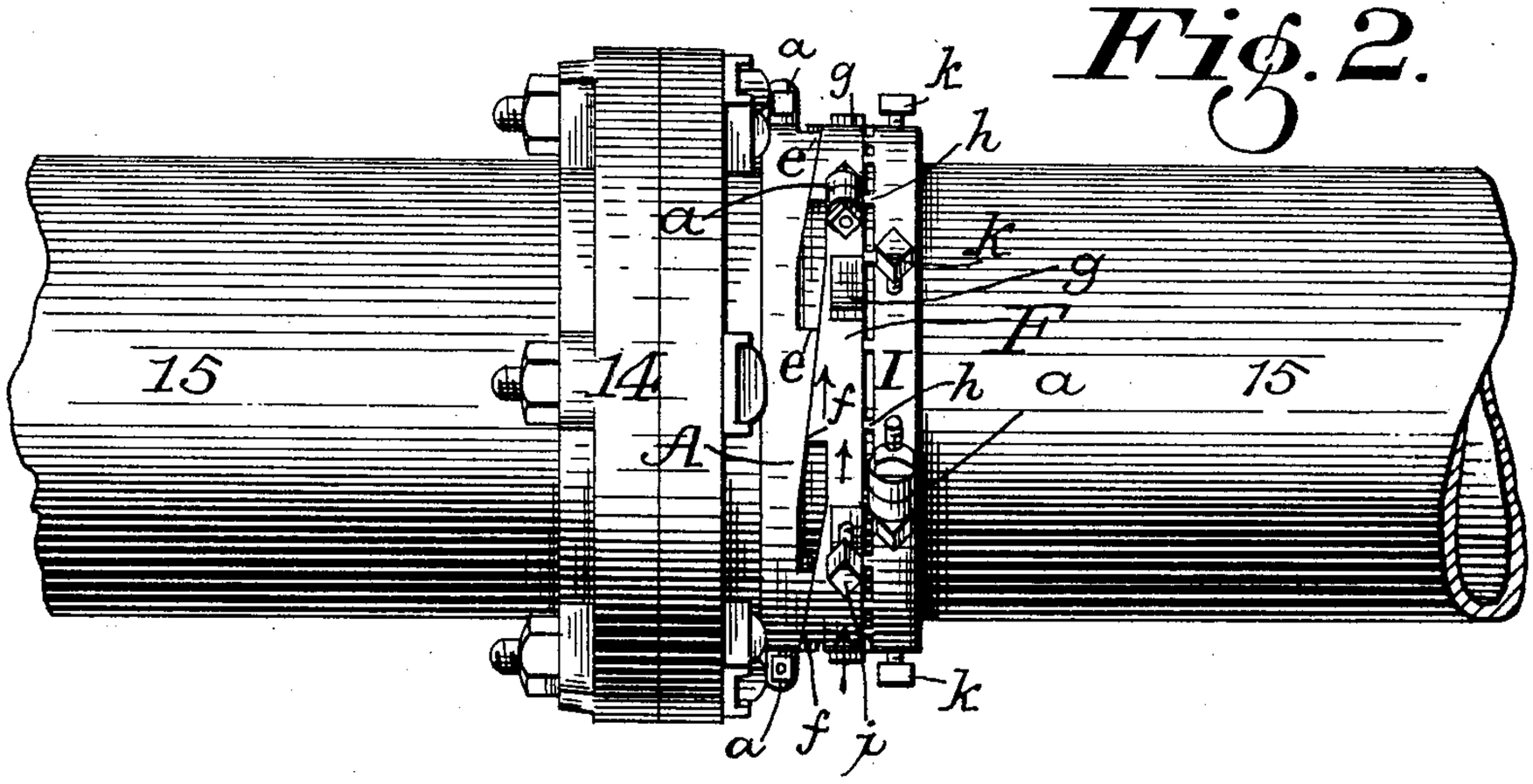
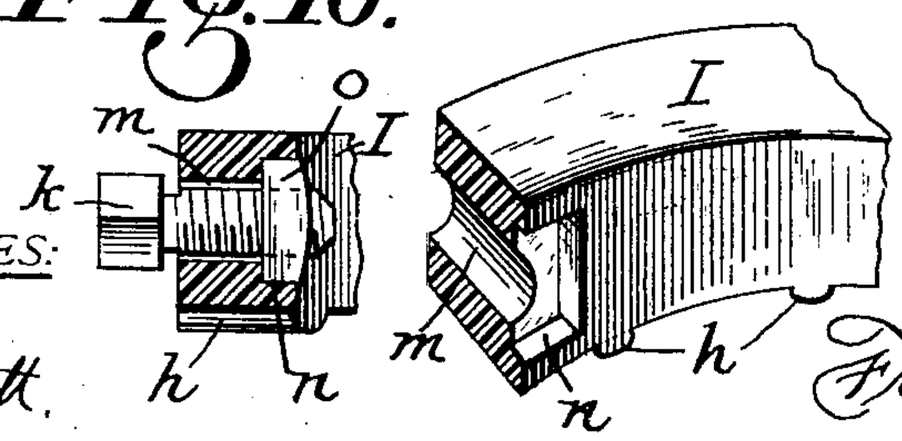


Fig. 10.



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CLAMP FOR CLOSING LEAKS.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

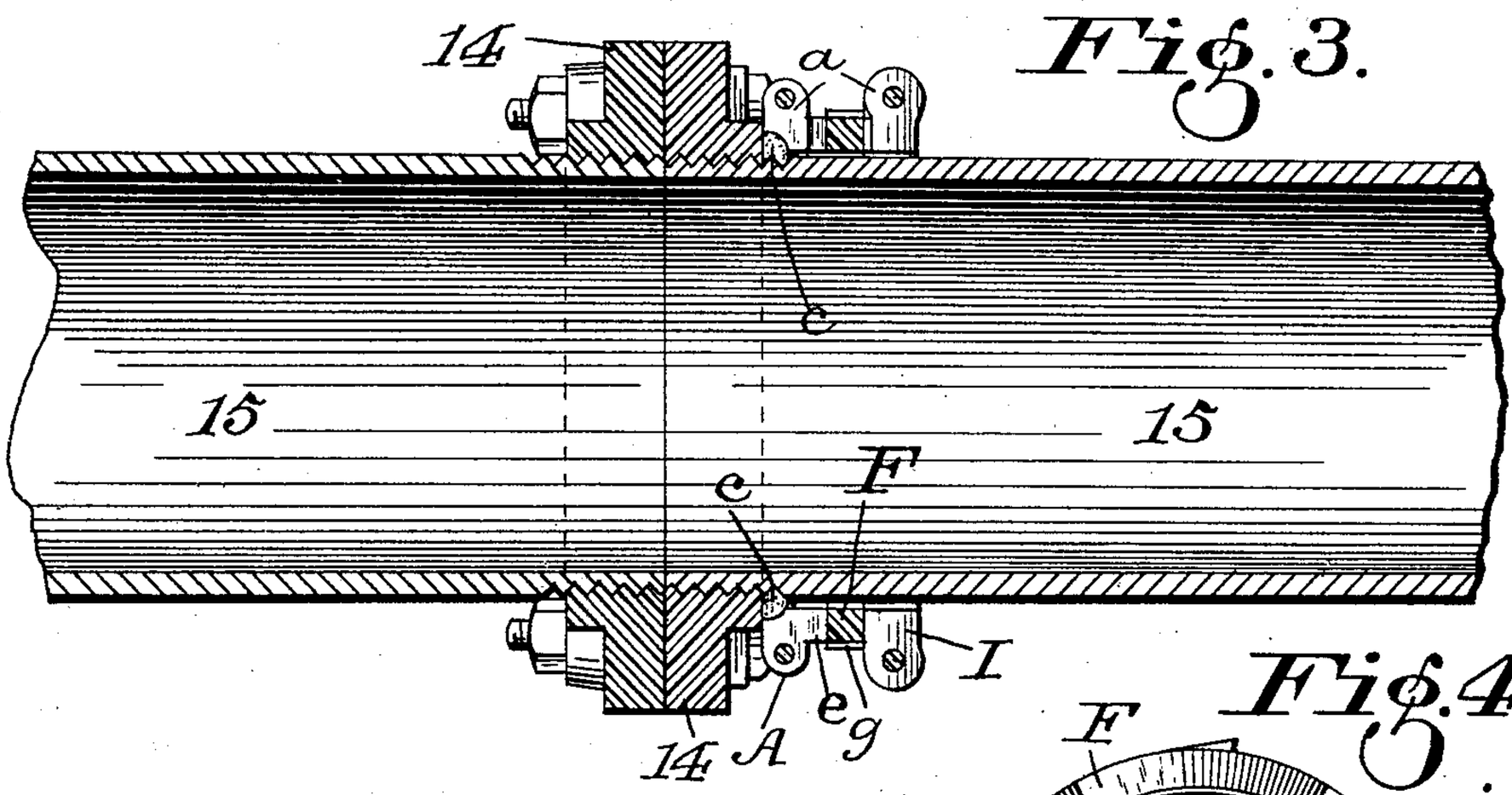


Fig. 4.

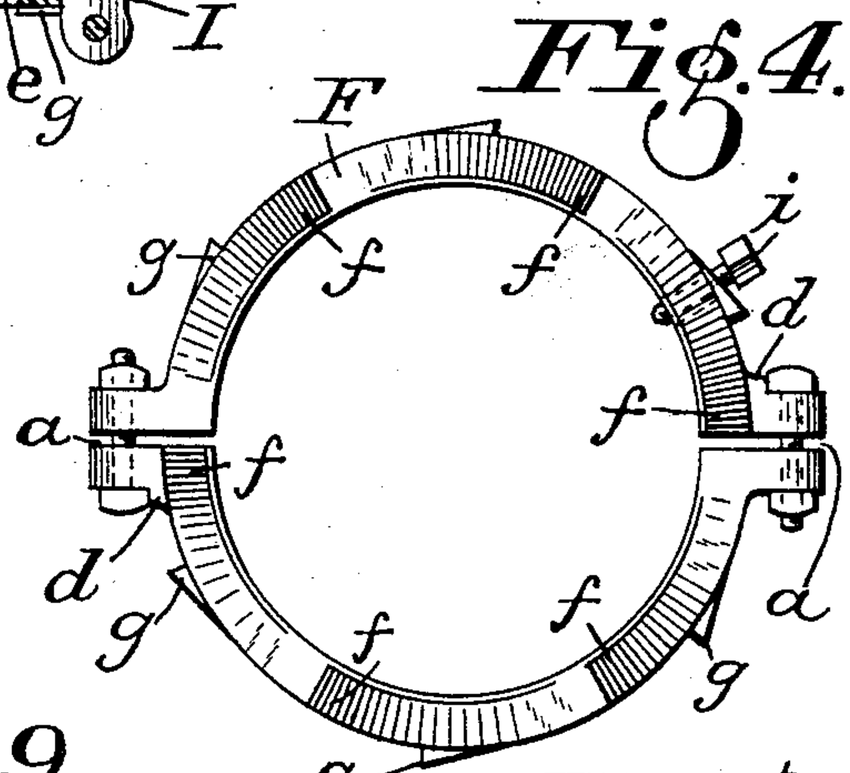


Fig. 5.

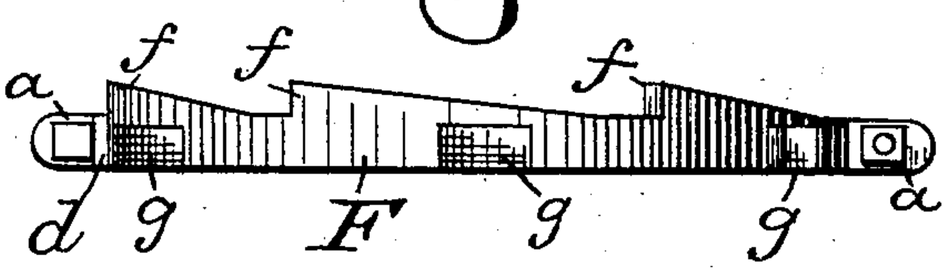


Fig. 6.

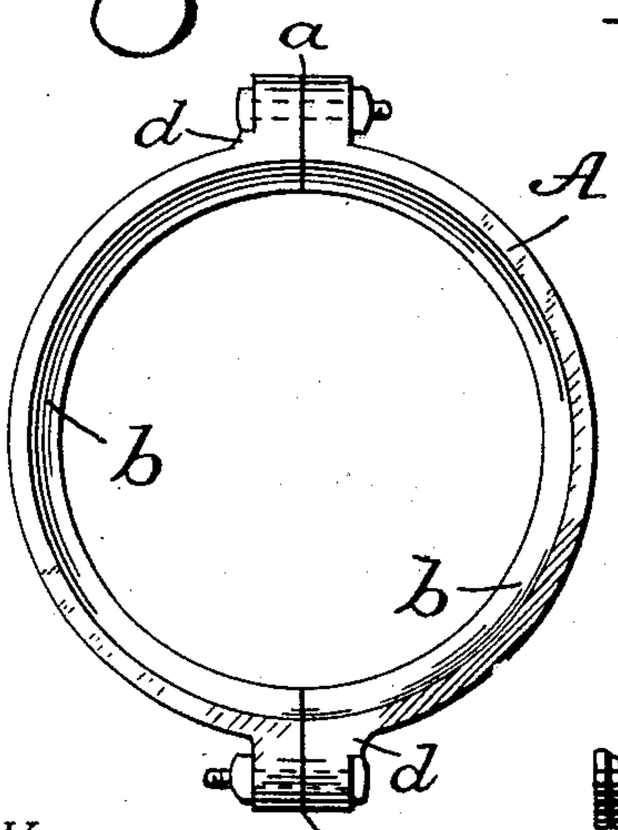


Fig. 9.

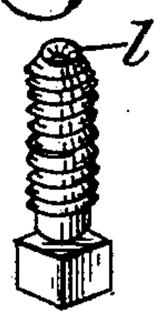
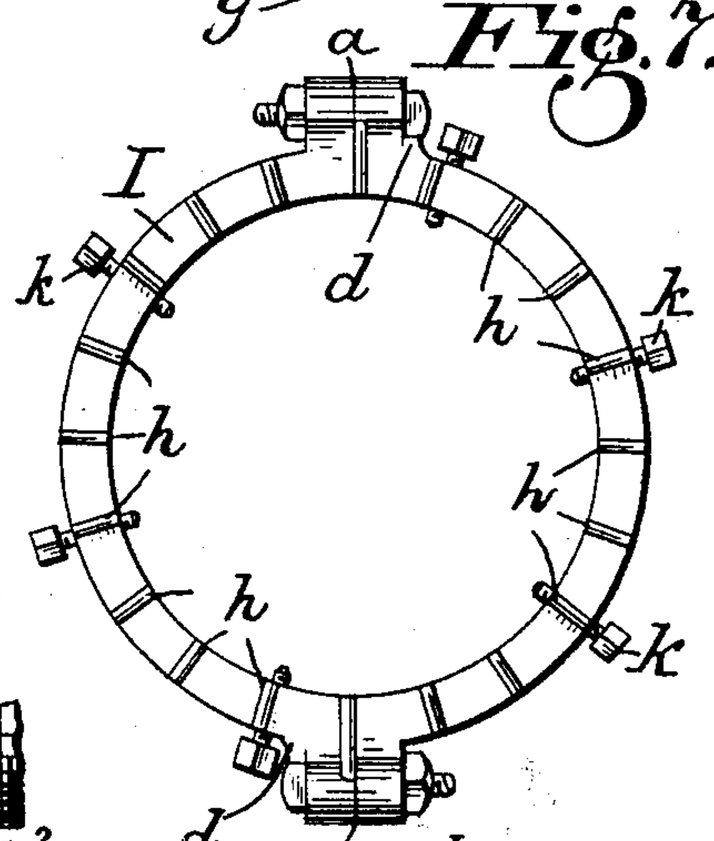


Fig. 8.

Fig. 7.



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No. 771,388. Patented October 4, 1904.

UNITED STATES PATENT OFFICE.

FRANK A. NUSBAUM, OF DAYTON, OHIO.

CLAMP FOR CLOSING LEAKS.

SPECIFICATION forming part of Letters Patent No. 771,388, dated October 4, 1904.

Application filed January 10, 1903. Serial No. 138,499. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. NUSBAUM, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Clamps for Closing Leaks; 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My present invention relates to an improved clamp for closing leaks, and is a distinct and separate invention over the leak-closing pipe-clamp upon which Letters Patent No. 646,754, dated April 3, 1900, was granted me.

Some of the principal objects of this invention consist in producing and providing means for quickly, readily, and effectively closing or stopping the leakage of steam or water from pipes wherever the leak may occur, whether at a joint or junction of an ordinary union or at an elbow or straight fitting or coupling, without necessitating shutting down for the purpose of draining said water or turning off said steam from the pipes, thus saving all delay and inconveniences incidental thereto, and in providing a device that does away with all objectionable elements, such as a "stuffing-box" and the use of a "spanner," and avoiding numerous complicated parts so frequently employed, and, further, in greatly reducing the cost of manufacture by doing away with all longitudinal set-screws, and where it is necessary to employ screws to grip the pipe I so arrange them as to do away with all screw-threaded openings in the rings by making a straight bore or opening and in providing a recess to receive a nut, thereby obviating the necessity of any and all machine-work.

My invention consists, referring in general terms to its construction, of a retaining-ring, a compressing-ring, and a central or driving ring, and suitable means formed upon said driving and compressing rings whereby said driving-ring when turned will cause said compressing-ring to force or compress suitable packing against the leak, thereby closing or stopping the same, and the peculiar combination, formation, and arrangement of these parts, as will be more fully described hereinafter and particularly pointed out in the subjoined claims in accordance with the statutes in such cases made and provided therefor.

Referring to the annexed drawings, illustrating my invention, and wherein the same numerals and letters of reference indicate like parts wherever they occur throughout the several views, Figure 1 is a view in side elevation of a portion of two sections of pipe and their coupling or fitting with my improved clamp thereon, showing the position the parts assume when first placed around the pipe before the packing has been forced against the leak by means of the central or driving ring and the compressing-ring. Fig. 2 is a view similar to Fig. 1, but showing the parts in the position they assume after the leak has been closed by forcing or compressing the packing against the joint through the medium and action of the central or driving and the compressing rings. Fig. 3 is a longitudinal section view through the pipe-sections and their coupling or fitting with my improved clamp in the position its parts will assume when the packing has been forced against the joint in the act of closing a leak. Fig. 4 is plan view of the central or driving ring looking at the face which works against the face of the compressing-ring; and Fig. 5 is a side elevation of the same as shown in Fig. 4, but on a slightly-enlarged scale. Fig. 6 is plan view of the compressing-ring looking at the face which bears or abuts against the coupling or fitting, so as to clearly show the recess or groove which receives the packing. Fig. 7 is a plan view of the retaining-ring looking at the face which abuts against the central or driving ring, so as to clearly show its antifriction lugs or ribs. Fig. 8 is a detail view, partially broken away and in section, approximately full size, so as to clearly show the position the packing assumes as it rests in the compressing-ring and bears against the joint or junction of pipe and coupling in

the act of closing a leak. Fig. 9 is a detail view in perspective of one of the set-screws; and Fig. 10 is a detail sectional view transversely of the retaining-ring, so as to show the position of the set-screw and nut, also a detail sectional view, partially in perspective, showing the straight bore or opening and the recess for the set-screw and its nut, respectively.

In describing my said invention in detail and having reference to the different parts or features thereof as illustrated in the various views of the drawings and indicated by means of the numerals and letters of reference, as aforesaid, 14 designates a coupling or fitting which connects the ends of the sections of steam or water pipes 15.

Compressing-ring A is preferably made in two or more sections and bolted together, as at *a*, (see more particularly Fig. 6,) for convenience in placing around the pipe so as to rest or abut against the shoulder of coupling or fitting 14 when in operative position, as shown in Figs. 1 and 4, which is the location where leaks most generally occur, said compressing-ring being provided on the face intended to abut against the coupling or fitting with a recess *b*, adapted to receive any suitable style of packing *c*, and being, preferably, further provided, if so desired, with a shoulder *d* at a point where the bolt-head rests for the purpose of insuring its holding more securely in position. The opposite face of said compressing-ring, or that which is removed from the coupling, is formed or provided with a series of inclined projections *e*, similar in shape to ratchet-teeth, adapted to interlock similarly-formed projections *f* on the central or driving ring F when the whole number of rings, which in their entirety constitute my improved clamp, are first placed around the pipe and before the compressing-ring, which rests sufficiently loose so as to have a slight sliding movement, has forced the packing into position, as clearly shown in Fig. 1, and which will be more fully described hereinafter.

As is more fully shown and more particularly seen in Figs. 4 and 5, central or driving ring F is made in two semicircular portions provided with bolts, as at *a*, the heads of which are prevented from turning by shoulders *d*, similar to compressing-ring A, and is further formed or provided with a number of driving-lugs *g*, which when any blunt instrument or tool is placed against them and struck by a maul or hammer will cause said central or driving ring, which rests loosely around the pipe, to turn in the direction indicated by the small arrow-heads, which will cause ratchet-shaped projections *f* to move from their interlocked position or engagement with the similar projections *e* of the compressing-ring, as hereinbefore referred to and shown in Fig. 1, and the inclined face of the projections *f* as its driving-ring moves around the section of pipe 15 will force the compressing-ring, which is held firmly in position as to lateral movement or turning upon the pipe-section by reason of the elasticity or expansion tendency of the packing, down against the shoulder of coupling 14, which will necessarily compress packing *c* against the leak, and at the same time the opposite face of said driving-ring will be forced and held against the antifriction lugs or ribs *h* of retaining-ring I, (see more particularly Figs. 7 and 10,) as will be more fully described hereinafter, and the parts will assume the position shown in Fig. 2, while packing *c* will be spread or compressed out at c^2, as is clearly shown and fully seen in Fig. 8, said driving-ring being provided with a set-screw *i*, by which it is prevented from shifting or moving when turned to the position shown in Fig. 2.

Retaining-ring I, as is more particularly shown in Fig. 7, is made or formed in two segments or semicircular parts, which are bolted together, as at *a*, and is preferably, if so desired, provided with a shoulder *d*, which forms a bearing for the bolt-head, thus insuring its resting firmly in position, similar to the compressing and driving rings, as hereinbefore described. A series of lugs *h* are formed upon the face of said retaining-ring, which abuts against the smooth face of the central or driving ring for the purpose of preventing any amount of friction which might otherwise be created as the said driving-ring is operated, as hereinbefore referred to. Said retaining-ring when once placed in its proper position around the pipe is held firmly and prevented from any movement or shifting whatsoever by means of a sufficient number of set-screws *k*, said retaining-ring, as can be readily seen and understood, thus retaining the other rings in position. Set-screws *k*, as well as set-screw *i*, I prefer to have sufficiently "cupped," as shown at *l* in Fig. 9, for the purpose of gripping more tenaciously to the pipe, and for the purpose of decreasing the cost of manufacture of my clamp I prefer that the openings in both the retaining and driving rings to receive said set-screws should be constructed as shown in Fig. 10—*id est.*, a plain smooth bore or opening *m* with a recess *n* at the end which receives and retains the nut *o* of said set-screws.

While I have described and shown compressing, central or driving, and retaining rings as all made up of or comprising two sections, it will be apparent and can be readily understood that more than two sections may be employed, according to the inside circumference or diameter required of said rings, which is regulated by the size of the pipes they are to be adjusted to.

It will be obvious from the foregoing description, taken in connection with the drawings, that I have produced a clamp that while it reduces the expense of manufacture to a

minimum cost, there being no machine-work necessary, is effective and practical, dispensing as it does with all of the complicated and objectionable parts and attachments in most of the similar devices now in use, also that my compressing-ring is so constructed that it takes the place of the objectionable and expensive gland-ring, and that by the use of my system of inclined projections *e* and *f* I have introduced an entirely new principle in the construction of leak-closing devices.

While I have herein set forth my invention in what I consider at the present time the preferred form in which to construct it, I desire it to be understood that I reserve to myself the right under the well-established doctrine of patent law to make any minor changes in the various features or elements of construction within the principles and scope of the invention as may from time to time suggest itself.

Having now described my improved clamp for closing leaks, what I claim as new and as my invention is—

1. In an improved clamp for closing leaks, the combination of the compressing-ring provided with a recess in which rests the packing-ring; a detachable central or driving ring adapted to be turned, and provided with one or more set-screws for holding it stationary after having been turned; a detachable retaining-ring provided with a series of lugs, also screws for holding it upon the pipe; and means formed or provided upon said central or driving, and said compressing rings, whereby said means may come in engagement one with the other, thus causing the packing to be compressed around the joint or junction of said pipe and the coupling or union.

2. The combination in the improved clamp for closing leaks, of a sectional retaining-ring having a series of lugs or projections upon the face thereof and provided with a number of set-screws for holding it immovably in position; a sectional central or driving ring having a number of driving-lugs for turning it, one or more set-screws for preventing it from moving after having been turned, also further provided with a series of projections; a sectional compressing-ring having a recessed seat to receive the packing, and provided with suitable means to engage the projections upon said driving-ring whereby said compressing-ring will force the packing over the leak when said driving-ring is turned; all substantially as and for the purposes described.

3. In a device for closing leaks, a detachable compressing-ring formed with a recess for suitable packing and provided with a series of projections; a detachable central or driving ring provided with means for driving or turning it, one or more set-screws for rigidly holding it in position after having been turned, and means formed or provided upon the face of said driving-ring adapted to engage the projections upon said compressing-ring, whereby said compressing-ring will compress the packing over the leak; and a detachable retaining-ring provided with set-screws and lugs, for retaining the parts in operative position; all substantially as and for the purposes described.

4. In an improved clamp for closing leaks, an adjustable retaining-ring provided with a series of lugs and having a number of set-screws for holding it in position; an adjustable central or driving ring provided with a plurality of driving-lugs for moving it laterally, a series of projections; one or more set-screws for holding it in position; an adjustable compressing-ring adapted to slide or move longitudinally, a recess to receive suitable packing and provided with a series of projections; a packing-ring to rest in the recess of said compressing-ring; the whole so arranged and adapted as to compress or force said packing-ring around a joint so as to close the leak; all substantially as and for the purposes described.

5. The combination with a pipe and the coupling, or union or elbow thereof; of an adjustable retaining-ring formed with a suitable number of smooth bores or openings terminating in a recess adapted to receive a set-screw and nut, and having a face provided with a series of ribs; an adjustable central or driving ring formed with one or more smooth bores or openings terminating in a recess adapted to receive a set-screw and nut, and having a sufficient number of driving-lugs, and provided with a series of ratchet-shaped projections; an adjustable compressing-ring having an annular groove or recess, and provided with a series of ratchet-shaped projections; and a suitable packing-ring to rest in said annular groove; the whole adapted substantially in the manner and for the purposes described.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANK A. NUSBAUM.

Witnesses:

J. O. HARTSHORN,

L. HARKE.