No. 773,945. PATENTED NOV. 1, 1904.

M. KRONAUER.

LOCK BAR PIPE.

APPLICATION FILED JULY 15, 1904.

NO MODEL.

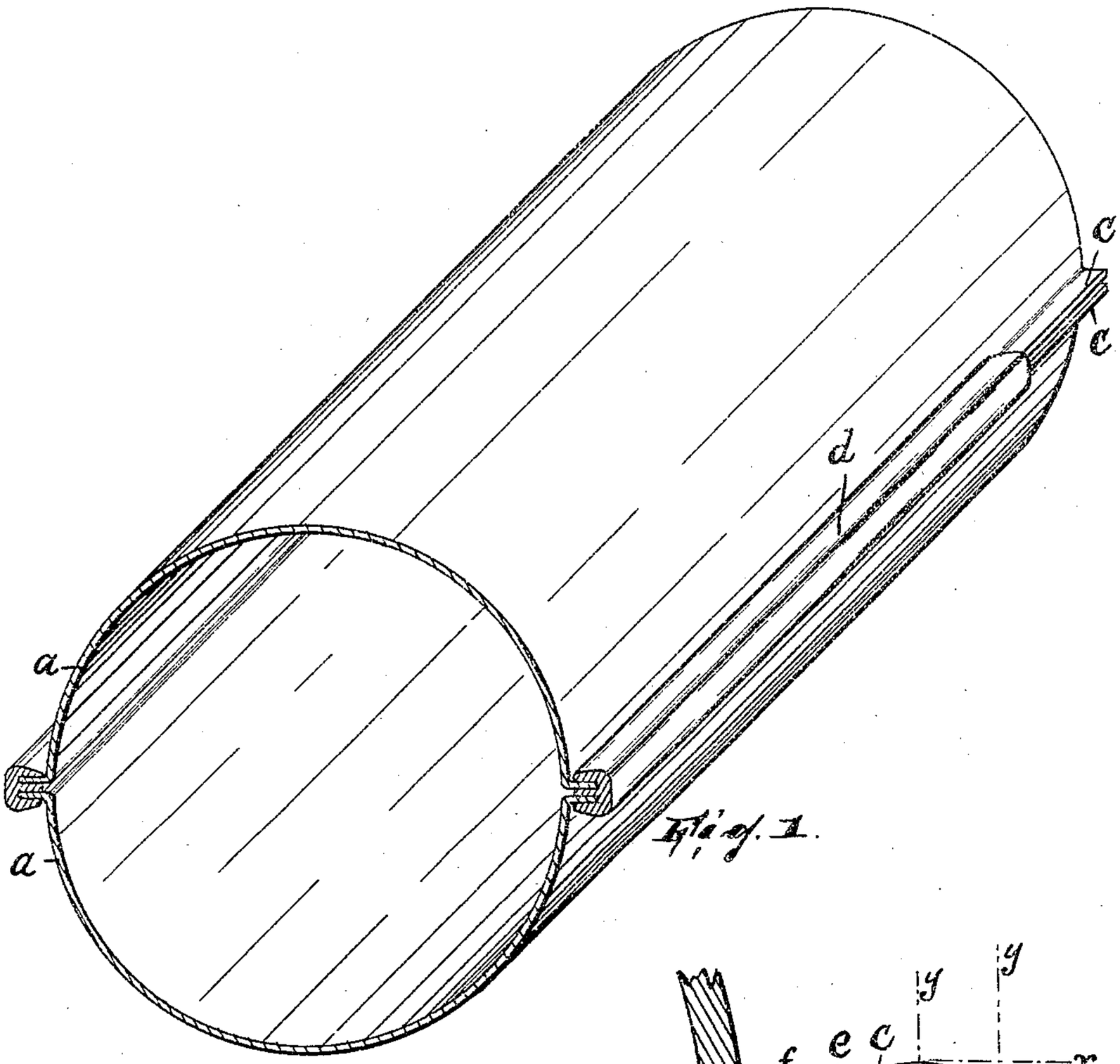

Fig. 1.

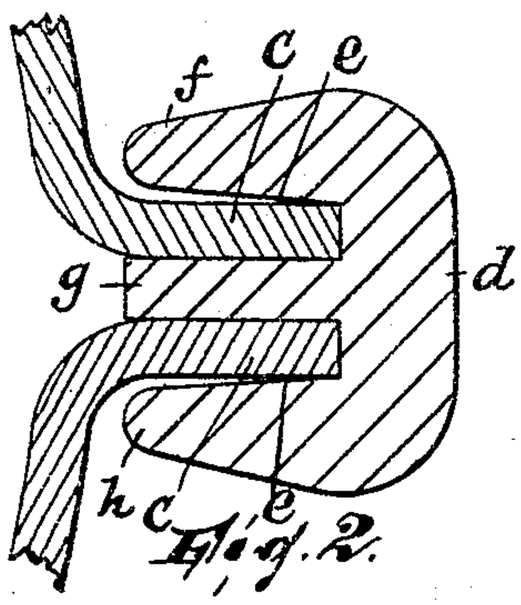

Fig. 2.

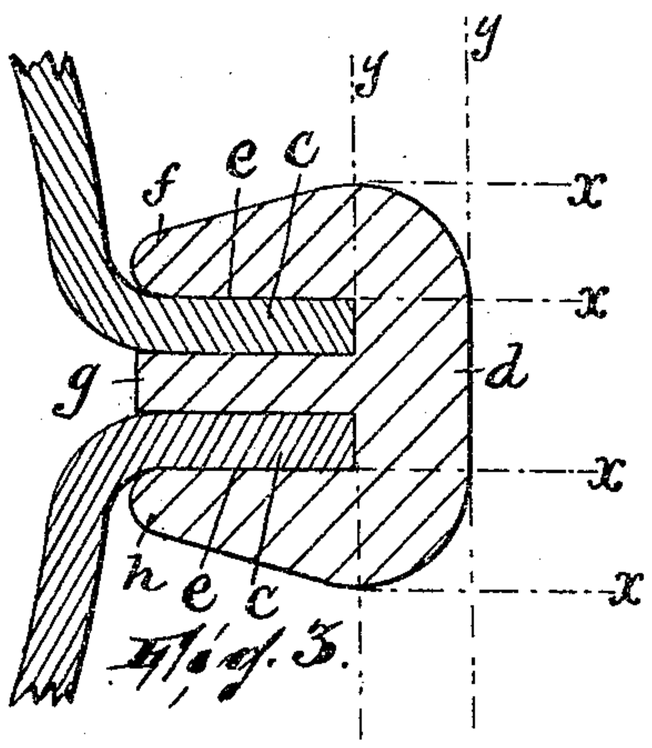

Fig. 3.

WITNESSES:

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No. 773,945. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

MAX KRONAUER, OF PATERSON, NEW JERSEY.

LOCK-BAR PIPE.

SPECIFICATION forming part of Letters Patent No. 773,945, dated November 1, 1904.

Application filed July 15, 1904. Serial No. 216,655. (No model.)

To all whom it may concern:

Be it known that I, MAX KRONAUER, a citizen of the Republic of Switzerland, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Lock-Bar Pipes; 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to the construction of systems of piping of that type in which a plurality (usually two) of curved plates are held together edge to edge by locking-bars to make up a single length of pipe. In ordinary pipe of this kind, termed in the art "lock-bar pipe," the adjoining edges of the plates are inserted in opposite grooves formed in the lock-bars and therein securely clamped by compressing the grooved portions of the bars. The principal objection to this form of pipe is that no little difficulty attends the forming of the joint on account of the necessity for bringing apparatus to bear at the inside as well as the outside of the pipe in order to compress the locking-bars, entailing as it does the use of a cumbrous and powerful machine having a mandrel whose reach is considerable and requiring much moving about of the work.

My invention has for its object to provide a lock-bar pipe which while it possesses all of the many desirable features of the ordinary lock-bar pipe requires much less cumbrous machinery and difficulty in assembling it. It results in practice in the saving of several steps, which must be necessarily performed in the operation of forming a joint according to the present method above referred to.

My invention contemplates disposing the lock-bar sufficiently out of the plane of the wall of the pipe, so that a lock-bar-compressing means can be used whose thrust is in a direction tangential of the pipe instead of radial, and in order to do this and secure an effective grip on the edges of the plates my invention contemplates a lock-bar having parallel longitudinal grooves formed in one side thereof and adapted to receive the bent-up edges of the plates to be joined thereby.

The invention will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of a section of a completed length of the improved lock-bar pipe, a portion of one of the lock-bars being broken away to show how the edge portions of the plates are shaped previously to assembling. Fig. 2 is an enlarged transverse sectional view through a lock-bar and the edge portions of plates to be held thereby after the lock-bar and plates have been assembled, but before the lock-bar has been made to grip the plates by being compressed in its grooved portion; and Fig. 3 is a view like Fig. 2 except that it shows the parts after the lock-bar has been compressed in its grooved portion so as to grip the plates.

In the drawings, *a* designates the plates, the same having their longitudinal edges bent off, preferably at right angles to the plane of the contiguous portions *b* of the plates, so as to form longitudinal flanges *c*, which after the plates have been assembled in tubular disposition stand in the adaptation shown parallel to each other, projecting in the same direction.

It is of course preferable to bend the edge portions outwardly, as shown, so as to avoid projections on the inside of the pipe.

d is the locking-bar. This is provided with longitudinal grooves *e*, formed in the side thereof which stands next adjacent the plates in the final assemblage of the parts, and thus producing three longitudinal fins or jaws *f g h*. When the bar issues from its forming process, the grooves *e* are shaped substantially as shown in Fig. 2, where in cross-section they appear wider at the mouths than at the bottoms thereof.

The plates being formed with the flanges *c*, as above described, and then assembled to compositely form a tubular body, the locking-bars are applied, adjacent flanges *c* being inserted into the grooves *e* as far as the depths of the latter permit, whereupon the bars are compressed to give them the form shown in Fig. 3, and thus secure a good grip on the flanges.

The friction between the surfaces of the flanges *c* and grooves *e* enters in as a very essential factor in preventing the flanges from being pulled out of the grooves, and this effect is found to be practically doubled if the bar is formed with two grooves, as above described, one to receive each flange instead of only one receiving both flanges, and I find it of great importance in order to maintain the friction referred to, especially when the grooves *e* approach true parallelism, to make the bar relatively thick between the lines *x* in Fig. 3 as well as also between lines *y*. Any action of the plates in such a case which would effect the spreading apart of the fins or jaws would mean the moving of said jaws about points in their base portions as fulcrums, thus, in effect, making levers of said jaws. This is therefore counteracted by thickening the metal at the bases of the jaws in the manner above described.

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

1. The combination of two sheet-metal bodies having their edge portions lying in substantially the same plane and projecting toward each other and a lock-bar joining and securing together said edge portions, the extremities of said edge portions being bent up together out of said plane to form flanges and said lock-bar having longitudinal parallel grooves formed in the side thereof next adjacent said edge portions and receiving said flanges and said lock-bar being compressed to secure said flanges in said grooves, substantially as described.

2. The combination of a plurality of curved plates arranged to compositely form a tubular structure and lock-bars joining and securing together adjacent edge portions of said plates, the extremities of said edge portions being bent up together out of the general plane of said edge portions to form flanges and each lock-bar having longitudinal parallel grooves formed in the side thereof next adjacent said edge portions and receiving said flanges and said lock-bar being compressed to secure said flanges in said grooves, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of July, 1904.

MAX KRONAUER.

Witnesses:
JOHN W. STEWARD,
ROBERT T. POLLITT.