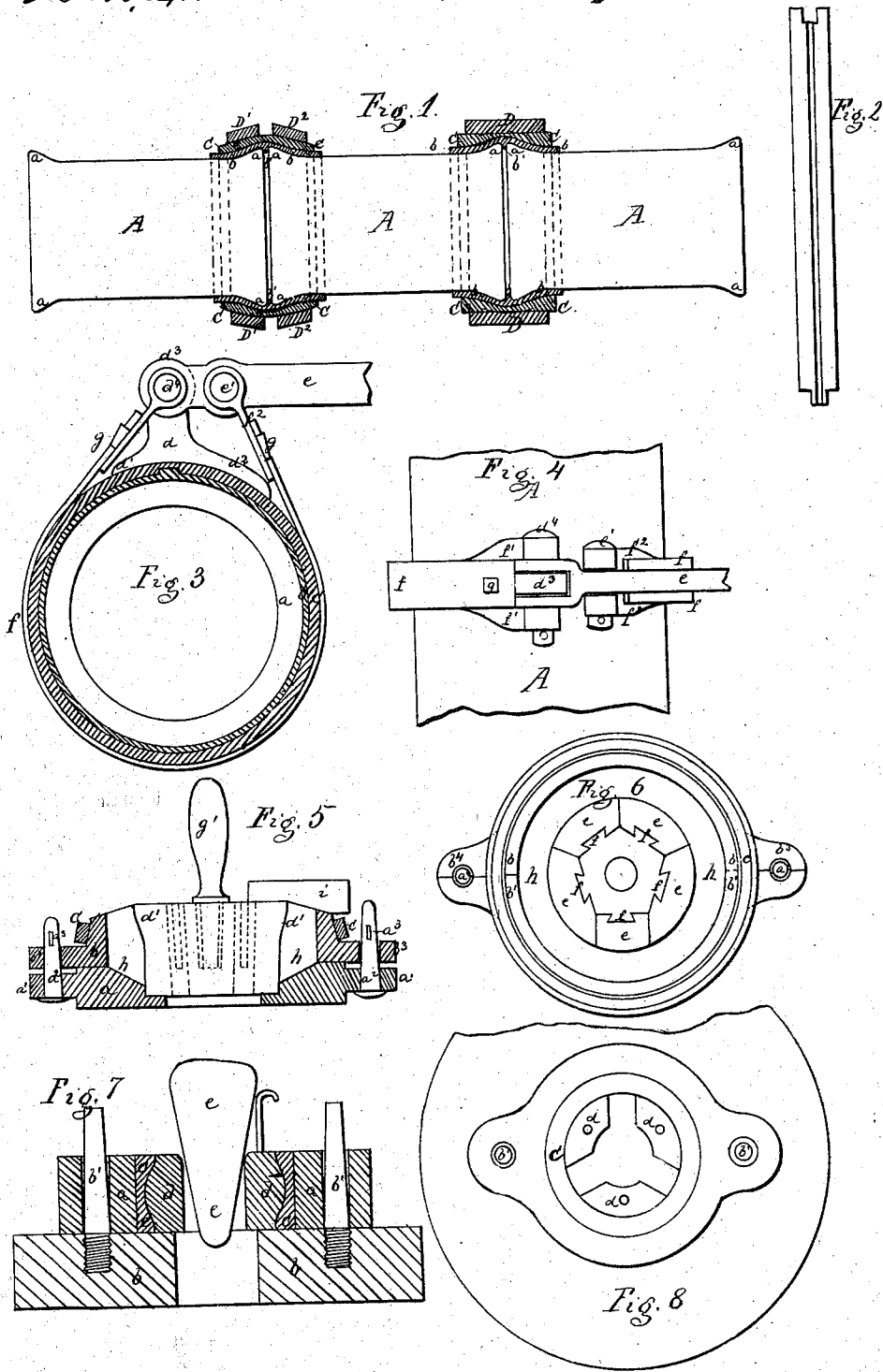


L. A. Farjon,

Pipe Coupling.

No. 106,041.

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Witnesses
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LOUIS ALEXANDRE FARJON, OF BRUSSELS, BELGIUM.

Letters Patent No. 106,041, dated August 2, 1870.

IMPROVEMENT IN PIPE-COUPPLINGS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, LOUIS ALEXANDRE FARJON, of Brussels, in the Kingdom of Belgium, civil engineer, a French subject, have invented or discovered new and useful Improvements in an Apparatus for Forming and Joining the Ends of Iron and other Tubes or Pipes; and I, the said LOUIS ALEXANDRE FARJON, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:

This invention consists of the improved mode hereinafter described, of forming the joints of pipes or tubes, whereby greater simplicity and economy are attained.

The ends of the pipes on the outside are formed of rather greater diameter than the body of the said pipes, tapering down so as to form a conical collar or projection round the ends of the said pipes.

A strip of lead is shaped by casting or rolling, so as to fit the conical projections on the ends of two pipes, and the said strip of lead is formed with a central rib underneath, which said rib projects into a space left between the ends of the pipes, to prevent them from touching each other, and to allow of their expanding.

The said strip of lead is placed round the respective ends of the pipes, and its two ends are joined by a tenon formed on one end of the strip taking into a channel or space cut in the other end of the said strip, to receive the said tenon.

The said strip is held in position and pressed onto the ends of the pipes by a band of iron rolled specially for the purpose, its lower surface being shaped to fit the lead on the pipe, and its upper surface being slightly conical, that is to say, thicker on one side than on the other.

The said band of iron is bent round to form a ring or hoop, which can open, to pass onto the lead, and, its diameter being rather smaller than that of the lead, the said ring or hoop forms a circular spring to press upon the said lead and hold it in position, and the said iron hoop or circular spring is further pressed onto the lead, and its ends are caused to meet, or nearly so, by a press-collar of the following construction:

A piece of iron is formed at its lower end in shape like a crescent or a portion of a circle, to fit and rest upon the circular spring on the pipe-ends.

On the upper surface of the said crescent-piece is a lug, projecting upward, to which is jointed one end of a lever, and also one end of a belt of iron or steel, which said belt passes round the circular spring on

the pipe-ends, and is jointed at its other end to the said lever at a little distance from that end which is jointed to the projecting lug of the crescent-piece.

By turning the lever the belt is drawn tight round the pipe-ends, and closes the circular spring upon the lead, compressing the said lead and forming a perfectly tight joint.

The circular spring being thus firmly fixed, a ring or hoop, the inner surface of which is conical, to fit the outside conical surface of the circular spring, is driven onto the said spring, and firmly binds the whole together.

In some cases, two binding-hoops may be used, one on each side of the joint. The protruding or superfluous portions of lead are then punched up, as is usual in such cases.

Pipes to be joined together according to this invention may have their ends molded in the following manner, in order that such ends, with their conical collars, may be cast perfectly smooth and regular.

A circular bottom plate is formed with a lug on each side, through each of which lugs passes a key-bolt.

Upon the said bottom plate is mounted an iron cylinder, with lugs corresponding with the lugs on the lower plate.

The said cylinder is formed of two half cylinders, being divided longitudinally through its axis or center, and through the said lugs, so that the two half cylinders may be separated laterally, but, being keyed to the lower plate, cannot rise. The said half cylinders are secured together by a hoop of iron placed round them.

The pattern of the pipe-end, having the conical collar or projection upon it, is divided into five segmental pieces, each formed at the back with a dovetail groove, into which takes a dovetail projection upon a conical center-piece moved by a handle.

The said pattern is placed in the center of the cylinder and bottom plate, and the space between the cylinder and pattern is filled with molding-sand, which, being suitably pressed and stamped, forms the mold for the outside of the pipe.

In order to take the molds out of the frame without injuring it, the iron hoop is taken off the outside cylinder, which then separates into two pieces, which may be easily removed.

The center-piece is then removed from the segmental pattern, and each of the segments may be taken out without injury to the mold, which is then ready for use, and may be added onto the mold of the body of the pipe.

It is desirable to give back to the circular springs, above mentioned, their exact sectional shape, which may have been injured during the process of bending them into a circular form.

For this purpose, a cylindrical die, the inner surface of which is conical, to suit the required shape of the outside of the circular spring, is mounted on an iron annular plate, and secured thereto by bolts or studs.

The circular spring having been driven into the said die, three or more segmental dies, having on their outer surface the required shape for the inner surface of the said circular spring, are placed within the said spring, and, by means of a conical plug driven into the center of the segmental dies, the said dies are forced against the inner surface of the said spring, and give it its required shape.

Having thus explained the nature of my invention, I will proceed to describe, with reference to the accompanying drawing, the manner in which the same may be performed.

Figure 1 represents in elevation, partly in section, three pipes, A A A, joined together according to this invention.

The ends of the pipes A, on the outside, are formed with conical projections or collars, *a a a*, upon them.

When the pipes are set end to end, so as nearly to touch each other, a strip of lead, *b*, shown in plan at fig. 2, shaped by casting or rolling, so as to fit the collars *a* of the pipes, and having underneath a central rib, *b'*, to project into the space between the said pipes, is placed round the respective ends of the pipes, and its two ends are joined by a tenon, *b²*, fig. 2, on one end of the strip, taking into a channel or space, *b²*, cut in the other end of the said strip *b*.

The said strip *b* is held in position and pressed onto the ends of the pipes A by a band, *c*, made of iron, rolled specially for the purpose, its lower surface being shaped to fit the outside of the lead *b*, and its upper surface being slightly conical, as shown.

The said band of iron *c* is bent round to form a ring, which can open to pass over the collars *a a* and onto the lead *b*, where it acts as a spring to press upon the lead and hold it in position, and the circular spring *c* is further pressed onto the lead, and its ends are caused to meet, or nearly so, by means of a press-collar, represented in front elevation at fig. 3, and in plan at fig. 4.

In these Figures 3 and 4—

A A represent parts of the pipes, and

a, fig. 3, the end of one of the pipes.

b is the strip of lead, and

c, the circular spring.

The press-collar is composed of a piece of iron, *d*, the lower end of which is curved so as to fit and rest upon the circular spring *c*, at *d'*.

The upper part of the piece *d* forms a lug, *d²*, to which is jointed, at *d²*, one end of a lever, *e*, and also one end, *f¹*, of a belt of iron or steel, *f*, which passes round the circular spring *c*, and at its other end *f²*, is jointed to the lever *e* at *e'*.

Near each end of the belt *f* is an opening or eye which hooks onto a projection, *g g*, on the links or ends *f¹ f²* of the said belt, so as to enable the said belt to be readily connected to or disconnected from its ends *f¹* and *f²*.

When the press-collar is mounted, as shown in the drawing, by turning the lever *e* on its fulcrum *d²*, the belt *f* is drawn tight round the pipe-ends, and closes the circular spring *c* on the lead *b*.

The press-collar is then removed from the circular ring *c*, and a ring or hoop of iron, D, fig. 1, the inner

surface of which is conical, to fit the outer surface of the circular spring *c*, is driven onto the said circular spring *c*, and firmly binds the whole together.

In some cases, two binding-hoops may be used, one on each side, as shown at D¹ D², fig. 1; the protruding portions of the lead *b* are then punched up, as is usual in such cases.

When it is required to disconnect pipes joined together according to this invention, the binding-hoops are driven off from the circular springs *c*, and the said circular springs are taken off from the lead *b*; the lead is then removed, and the pipes may be placed in another position and again joined together, if required, with the same facility.

I will now proceed to describe the mode which I prefer to adopt for molding the ends of pipes to be joined together according to this invention, in order to the said ends, with their conical collars, being cast perfectly smooth and regular.

Figure 5 represents a vertical section, and

Figure 6, a plan of a molding-frame constructed according to this part of my invention.

a is a circular base-plate, formed with a lug, *a¹* on each side, through which lugs pass the key-bolts *a² a²*.

b b' are two half cylinders, secured together by a ring, *c*, placed round them.

The two half cylinders, *b b'*, when secured together, form one cylinder, capable of being separated laterally at its lugs *b² b²*, which pass onto the key-bolts *a² a²*, and are secured to the base-plate *a* by keys *a² a²*.

d is the pattern of the pipe-end with its conical collar formed upon it at *d¹*.

The said pattern is divided into five segmental pieces, *e e e e e*, each formed at the back with a dovetail groove, into which takes one of the dovetail projections *f f f f f* on a conical center-piece, *g*, moved by a handle, *g'*.

The said pattern *d* is placed in the center of the cylinder *b b'*, and the space *h* between the pattern and cylinder is filled with molding-sand, which, being suitably pressed and stamped, and its upper surface having been smoothed by a scraper, *i*, forms the mold for the outside of the pipe-end.

In order to take the said mold out of the frame without injuring it, the hoop or ring *c* is taken off the outside of the cylinder *b b'*, which then separates into two pieces, which may be removed laterally.

The center-piece is then drawn out of the segmental pattern, and each of the segments *e e e e e* may be taken out of the mold, which is then ready for use.

My apparatus for giving back to the circular springs *c*, fig. 1, their exact sectional shape, which may have been injured during the process of bending them, is represented in vertical section at Figure 7, and in plan at Figure 8.

a is a cylindrical die, the inner surface of which is conical, to suit the required shape of the outside of the circular spring.

The said die *a* is mounted on an annular base-plate, *b*, to which it is secured by studs or bolts, *b¹ b¹*.

The circular springs *c*, having been driven into the die *a*, three or more segmental dies, *d d d*, having on their outer surface the required shape for the inner surface of the spring *c*, are placed within the said spring, and a conical plug, *e*, is driven into the center of the segmental dies *d d d*, and forces the said dies against the inner surface of the circular spring *c*, thus imparting to the said spring its required shape.

Having thus described the nature of my said

invention, and means for carrying the same into effect,

I claim as my invention—

The pipe-coupling herein described, formed by a ribbed leaden ring or muff *b b'*, embracing the adjacent ends of two pipes, *A a*, around which such ring is tightly clamped by a spring band, *c*, and

clamping-hoop or hoops *D*, substantially in the manner set forth.

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Witnesses:

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