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A. FRÖHLICH.

MEANS FOR BENDING PIPES.

APPLICATION FILED AUG. 15, 1904.

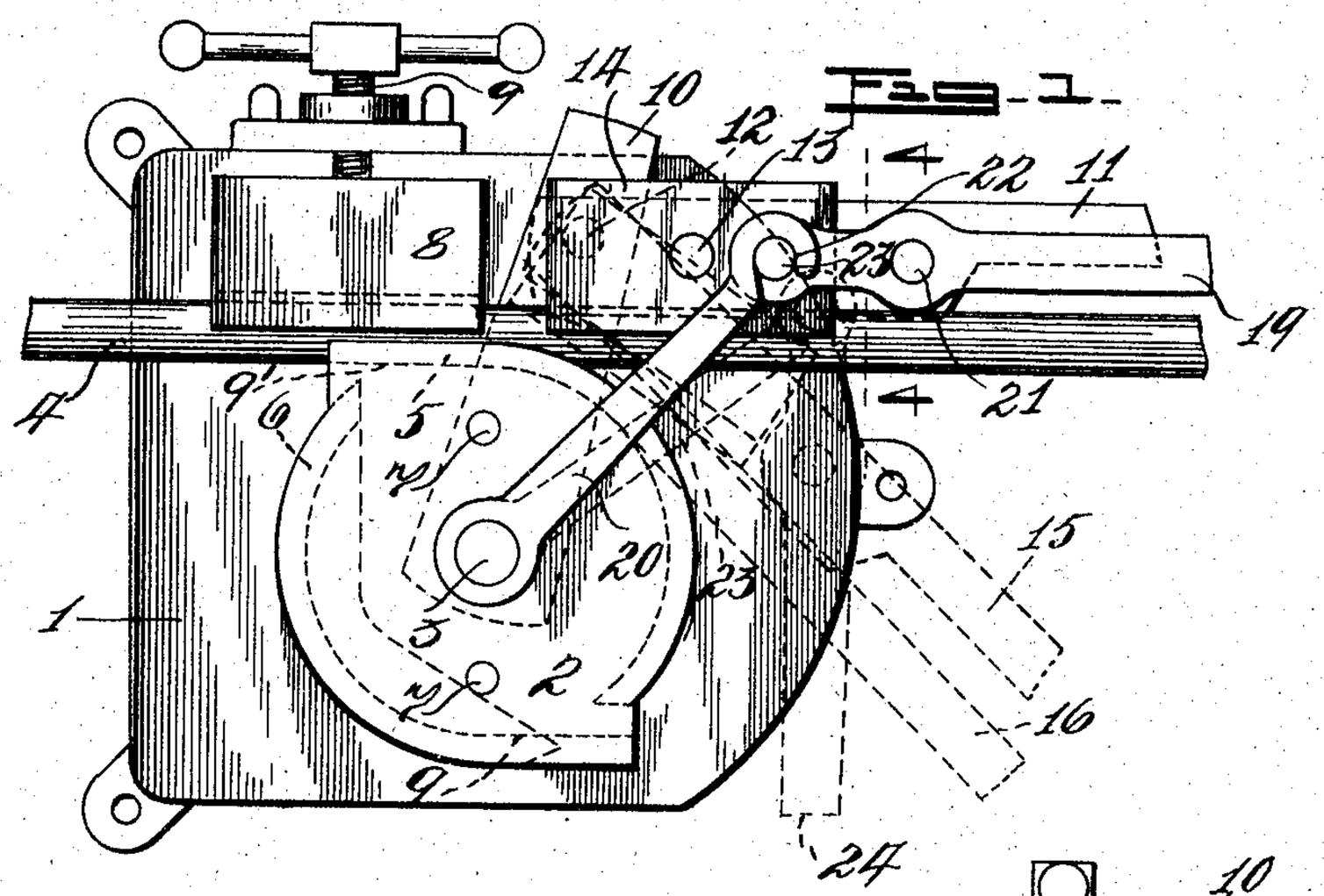

Fig. 1.

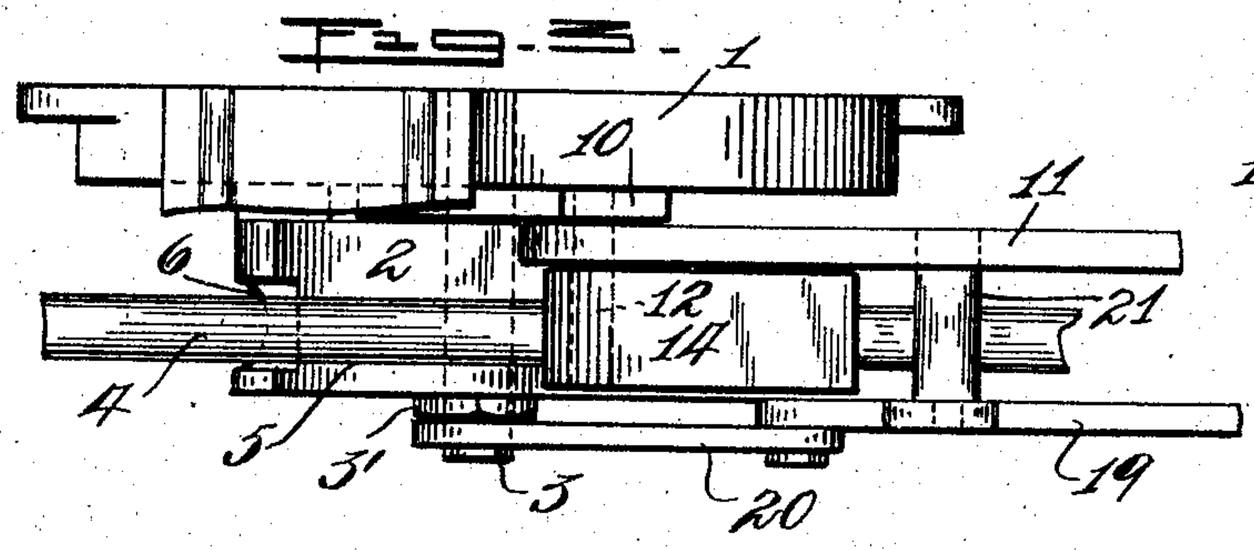

Fig. 3.

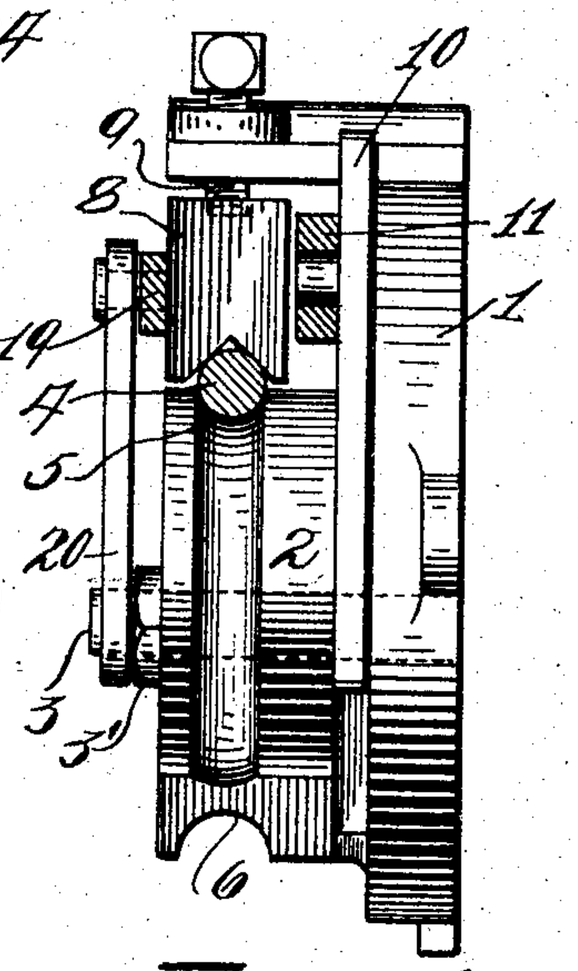

Fig. 4.

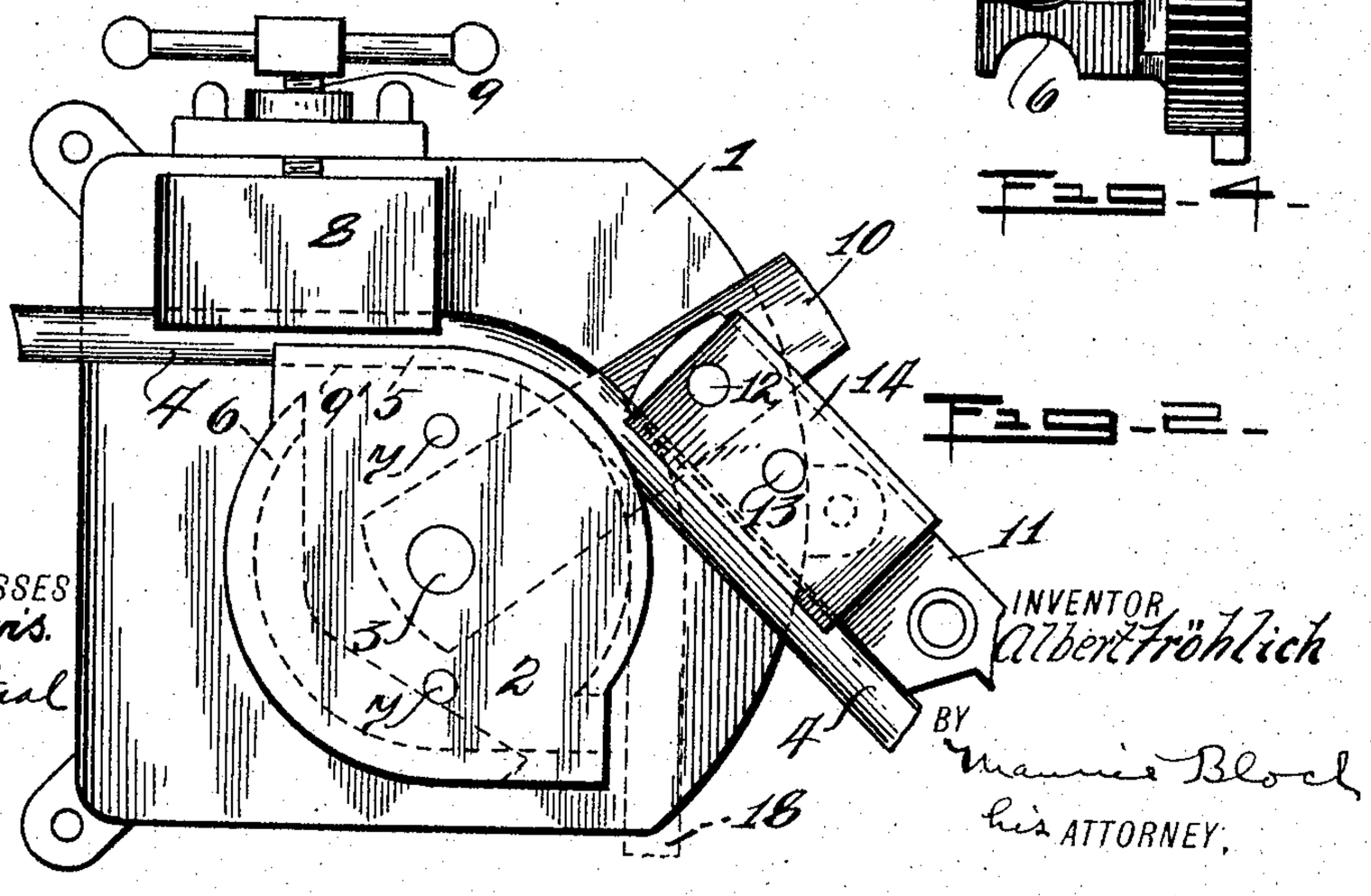

Fig. 2.

WITNESSES
C. A. Jarvis.
Hashel Corential

INVENTOR
Albert Fröhlich
BY
Maurice Block
his ATTORNEY.

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UNITED STATES PATENT OFFICE.

ALBERT FRÖHLICH, OF NEWARK, NEW JERSEY.

MEANS FOR BENDING PIPES.

SPECIFICATION forming part of Letters Patent No. 781,279, dated January 31, 1905.

Application filed August 15, 1904. Serial No. 220,699.

To all whom it may concern:

Be it known that I, ALBERT FRÖHLICH, a resident of Newark, Essex county, in the State of New Jersey, have invented certain new and useful Improvements in Means for Bending Pipes, of which the following is a specification.

The present invention relates to means for bending pipes in which the usual filling of the pipe to be bent with sand, balls, pitch, or other material to prevent the breaking of the pipe is dispensed with. To this end the pipe is bent around the periphery of a correspondingly-shaped former under the action of a pressure-lever, which lever, however, does not act directly on the pipe to be bent, but by means of a pressing-piece pivotally mounted on said lever. While the pressing-piece then continually adjusts itself at the bending-point tangentially with relation to the former, the pipe is always closely embraced at its bending-point by the pressing-piece, so that the material cannot escape laterally and the pipe cannot break.

The invention further consists in the novel details of improvement and combination and arrangement of parts, which will be hereinafter described and finally summarized in the appended claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 represents a side elevation of the device. Fig. 2 is a side elevation, but showing the bending mechanism in the act of bending a pipe. Fig. 3 is a plan view of Fig. 2 with some of the parts removed, and Fig. 4 is a cross-section taken on a line 4 4 of Fig. 1.

Similar characters indicate corresponding parts in all the views.

On the base-plate 1 the former 2 is rigidly secured by means of the bolt 3 and nut 3′. The former 2, around which the pipe 4 is to be bent, is provided with two different semicircular grooves or channels 5 and 6, so that pipes of different diameters can be bent. If the groove 6 is to be used, the former 2 is turned about one hundred and eighty degrees and is then fixed again, to which end stop-pins 7 7 are used, which during the operation prevent the former from being turned.

The pipe 4, as seen in Fig. 1, is first clamped between the upper part of the former 2 and the clamping-block 8, which, by means of the screw 9, can be forced against the pipe 4. The clamping-block 8, as seen from Fig. 4, is angularly bored out at its lower edge, so that it will fit onto every pipe. The former 2 is provided opposite the clamping-block 8 with the rectilinear part 9′ in order to permit the pipe 4 to be firmly clamped.

Pivotally mounted on the bolt 3 is an arm 10, having pivoted to its end, by means of the bolt 12, the pressure-lever 11. The arm 10 normally bears firmly on the base-plate 1 and, if necessary, may be fastened to the said base-plate, so that the bolt 12 forms a fixed fulcrum for the pressure-lever 11. Pivoted to the latter by means of the pivot 13 is the pressing-piece 14, which in the illustrated structural form is entirely rectilinear, but may be also slightly curved. At its lower pressing-face the pressing-piece 14 is semicylindrically bored in a similar manner as the periphery of the former 2.

In the position shown in Fig. 1 the lower pressing-face of the pressing-piece 14 is just in contact with the pipe 4 to be bent. If the pressure-lever 11 is now depressed into the position 15, the pressing-piece 14, which is adapted to turn around the pivot 13, adjusts itself continually at the bending-point of the pipe, so as to occupy a position tangential with respect to the pipe and the periphery of the former. (See position 16.) The pipe therefore is always closely embraced by the former 2 and the pressing-piece 14 at the bending-point, so that at this point the material cannot escape laterally, and the breaking of the pipe at the bending-point is therefore prevented. In this manner one can bend, by depressing the lever 11, the pipe 4 around a certain portion of the periphery of the former 2, so that the end of the pipe is forced into the position 16, Fig. 1. When a further bending of the pipe is no longer possible, the arm 10 is brought into the position illustrated in Fig. 2, the pressing-piece 14 assuming a rectilinear position again on the end of the pipe. By depressing the lever 11 the pipe is bent in a similar manner as before into the position

18, Fig. 2. In this way the pipe can be bent in several stages around the periphery of the former 2 without danger of breakage.

In bending stronger pipes the lever 11 can be depressed with correspondingly greater force by the insertion of two further levers 19 20. The lever 19 can be mounted to this end on a bolt 21 of the pressure-lever 11, whereas the lever 20 can be pivotally mounted on the central bolt 3 of the former. The lever 20 has at its end an open slot 22, which is engaged by the pin 23, secured to the end of the lever 19. If the lever is then depressed into the position 23, the pressure-lever is moved downward into the position 24, so that a considerably larger force is exerted on the pipe to be bent.

With my improved arrangement the bending of the pipe around the periphery of the former 2 can be readily effected in various stages.

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

1. In a pipe-bending device the combination of a base, a reversible former carried by the base, grooves within the surface of the former, the said grooves being of different sizes, a clamping means adapted to clamp a pipe in said grooves, and a pressing-piece adapted to bend the pipe, to conform with the shape of the former, when force is applied thereto.

2. In a pipe-bending device, the combination of a base, a removable reversible former carried by the base, means for securing the former to the said base, grooves, of different sizes within the surface of the former, means for clamping a pipe in any one of the said grooves, and a pressing-piece, adapted to bend the pipe, to conform to the shape of the former, when force is applied thereto.

3. In a pipe-bending device, the combination of a base, a reversible former carried by the base, the said former having a rounded edge with a flat surface at a tangent thereto, a groove extending along the said surface and rounded edge, a clamping means adapted to clamp a pipe in the groove at the said flat surface, and a pressing-piece adapted to bend the pipe to conform to the said rounded edge of the former, when force is applied thereto.

ALBERT FRÖHLICH.

Witnesses:
HASKEL CORENTHAL,
SAMUEL SWANSAN.