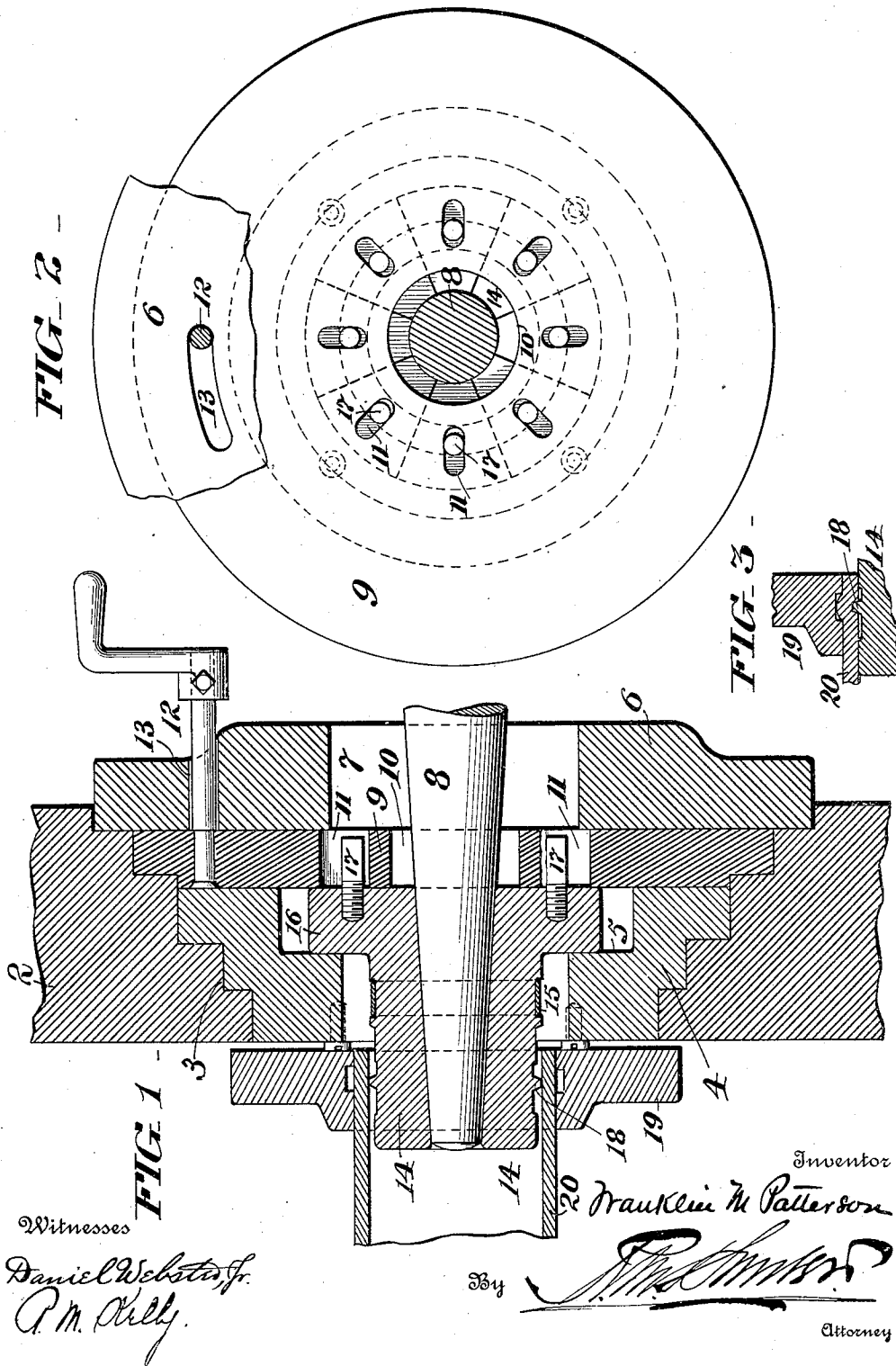


F. M. PATTERSON.
DIE FOR PIPE FLANGING MACHINES.
APPLICATION FILED NOV. 8, 1911.

1,057,664.

Patented Apr. 1, 1913.



Witnesses
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UNITED STATES PATENT OFFICE.

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DIE FOR PIPE-FLANGING MACHINES.

1,057,664.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed November 8, 1911. Serial No. 659,095.

To all whom it may concern:

Be it known that I, FRANKLIN M. PATTERSON, a citizen of the United States, a resident of Bayonne, Hudson county, State of New Jersey, have invented an Improvement in Dies for Pipe-Flanging Machines, of which the following is a specification.

My invention has reference to dies for pipe flanging machines and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

My invention has particular reference to dies for use in connection with hydraulic pipe flanging machines of the character shown in Letters Patent of the United States No. 867,333 dated Oct. 1, 1907, granted to me; and my present improvements more particularly comprehend means for shifting the expanding die portions within the pipe end and flange for the purpose of shifting the position of the line of juncture between the adjacent die sections after each expanding operation, so that the expanded pipe within the pipe flange may have a continuous line of expansion irrespective of the fact that the expanding die is formed of a plurality of sections arranged in annular form and separate circumferentially on expanding.

My invention consists of an expanding die composed of a plurality of segments annularly arranged and provided with a tapering aperture formed by the inner portions of the sections, combined with a supporting structure having an adjustable portion by which the sections are rotatably held and by which they are circumferentially sustained against independent circular motion, and means for moving the said adjustable portion of the supporting structure for circumferentially adjusting the expanding die.

More particularly, my invention comprehends an expanding die formed of a plurality of segments rotatively movable, combined with expanding means for moving said segments radially, means for moving the said sections circumferentially, and an abutment for supporting the die sections against shifting during the expanding operation.

My invention also comprehends details of construction which, together with the features above specified, will be better under-

stood by reference to the drawings, in which:—

Figure 1 is a sectional elevation of pipe flanging dies embodying my invention; Fig. 2 is a front elevation of the die portion of the same with a part in section and a part broken away; and Fig. 3 is a sectional view showing the making of the union between the pipe and flange by the die.

2 is the main housing for supporting the dies and pipe flange; it receives the thrust of the tapered arbor 8 when forced forward by the hydraulic or other operating means (not shown). This housing 2 has an aperture through it which is preferably stepped as at 3; and in this, the die structure is received and held.

14 are the die segments and are provided with the expanding rib 18 and the radial flanged ends 16; and said segments, when held together by the spring bands 15, form an annular structure with a central tapered hole, a body with a circumferential rib 18 and a circular end flange 16. The body of the die extends through a ring support 4 which has the annular groove 5 in which the flange portions 16 of the die are received and guided. The diameter of this groove 5 is considerably larger than the diameter of the flanged portion 16 of the die, so that the die may shift upon its support 4 to adapt itself to the alinement of the tapered arbor 8. The die is held to the ring support 4 by the annular plate 9 which is guided between said support and an outer retaining plate 6 so as to have capacity for rotatory movement. The plate 6 is suitably held to the housing and has a central opening 7 for the arbor 8. The outer peripheries of the parts 4 and 9 are turned to fit the stepped portion 3 of the housing. The plate 9 is provided with a plurality of radial slots 11, one for each segment of the die; and said slots receive pins 17 extending from said die segments. The construction is such, that a rotatory movement of the plate 9 will rotate the die and will also permit the segments to be moved radially in expanding the die by the arbor 8. This annular plate 9 is provided with a handle 12 extending through a slot 13 in the retaining plate 6, which permits a limited rotatory motion being given to the annular plate.

20 is the pipe or tube, the end of which is to be expanded into the flange or ring 19

by the action of the die segments and their ribs 18 (Fig. 3).

In the operation of the apparatus, the pipe and flange are placed in position, as indicated in Fig. 1, and the tapered arbor 8 moved forward to force the die segments outward. The arbor is then withdrawn and the spring 15 causes the segments of the die to assume their original or normal condition and with the die released from frictional contact with the pipe. The handle 12 is then shifted in the slot 13, with the result that the annular plate 9 and die as a whole are rotated about the arbor 8 through an arc approximately one half of the arc formed by the segments. The arbor is then again thrust forward and a second expanding of the die accomplished, with the result that the ribs 18 will, in this instance, expand those portions of the pipe which were not fully expanded in the first operation, namely those portions between the die segments when expanded. In this way a perfectly expanded joint is secured; and the operations may be performed with accuracy and facility, since no care as to adjustment will be necessary.

It is to be understood that, while the stepped arrangement of the housing and parts 4, 6 and 9 are shown, such is not essential, as these latter parts may be assembled in any other suitable manner and held to the housing. The essential feature of my invention is the provision for imparting to the die segments a definite rotary adjustment between expanding operations and with capacity for radial movement of the segments during the expanding operations after each rotary adjustment has been made. Therefore, while I have shown my invention in the form which I have found well adapted to commercial use, I do not restrict myself to the details, as these may be modified without departing from the spirit of the invention.

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

1. In a pipe flanging die structure, the combination of an annular die divided into a plurality of segments each having a radial flange, a support independent of the work through which the die extends and against which the radial face of each of the flange portions adjacent to the expanding portions rests with provision for radial and rotary adjustment, an expanding tapered arbor for expanding the die, and hand controlled means independent of the support for the dies connecting with each of the die segments for simultaneously imparting to them a limited rotary adjustment independent of their capacity for radial adjustment by the arbor.

2. In a pipe flanging die structure, the

combination of an annular die divided into a plurality of segments each having a radial flange, a support through which the die extends and against which the radial face of each of the flange portions adjacent to the expanding portions rests with provision for radial and rotary adjustment, an expanding tapered arbor for expanding the die, and hand controlled means independent of the support for the dies connecting with each of the die segments for simultaneously imparting to them a limited rotary adjustment independent of their capacity for radial adjustment by the arbor, said means consisting of a rotary plate having radial slots, pins on the end of the die segments extending into the slots, and a handle secured to the rotary plate for adjusting it.

3. In a pipe flanging die structure, the combination of an annular die divided into a plurality of segments each having a radial flange, a supporting plate through which the die extends and against which the radial face of each of the flange portions adjacent to the expanding portions rests with provision for radial and rotary adjustment, an expanding tapered arbor for expanding the die, hand controlled means independent of the support for the dies connecting with each of the die segments for simultaneously imparting to them a limited rotary adjustment independent of their capacity for radial adjustment by the arbor, said means consisting of a rotary plate independent of the supporting plate and having radial slots, pins on the ends of the die segments extending into the slots, and a handle secured to the rotary plate for adjusting it, a housing for supporting the supporting plate for the die and a retaining plate carried by the housing having means for limiting the rotary adjustment of the rotary plate.

4. In a pipe flanging die structure, the combination of an annular die divided into a plurality of radially movable segments, means for normally holding the die segments in annular form, a taper arbor for expanding the die segments relatively to each other, means for holding the die against longitudinal movement under the action of the arbor, hand controlled means separable from the means for holding the die for imparting a simultaneous rotary adjustment to all of the die segments when in their normal contracted positions, and means for limiting the extent of said rotary adjustment.

5. In a pipe flanging die structure, the combination of an annular die divided into a plurality of radially movable segments, means for normally holding the die segments in annular form, a taper arbor for expanding the die segments relatively to each other, means for holding the die against longitudinal movement under the

action of the arbor, hand controlled means
separate from the means for holding the die
and consisting of rotatable plate having ad-
justable connections with the die segments
5 for imparting a simultaneous rotary adjust-
ment to all of the die segments when in
their normal contracted positions, and
means for limiting the extent of the rotary
adjustment of the die segments as a whole
10 consisting of a pin on the rotatable plate

working through a segmental slot in the
means for holding the die segments against
longitudinal movement.

In testimony of which invention, I here-
unto set my hand.

FRANKLIN M. PATTERSON.

Witnesses:

JOHN H. CETTIN,
WM. F. MADILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
