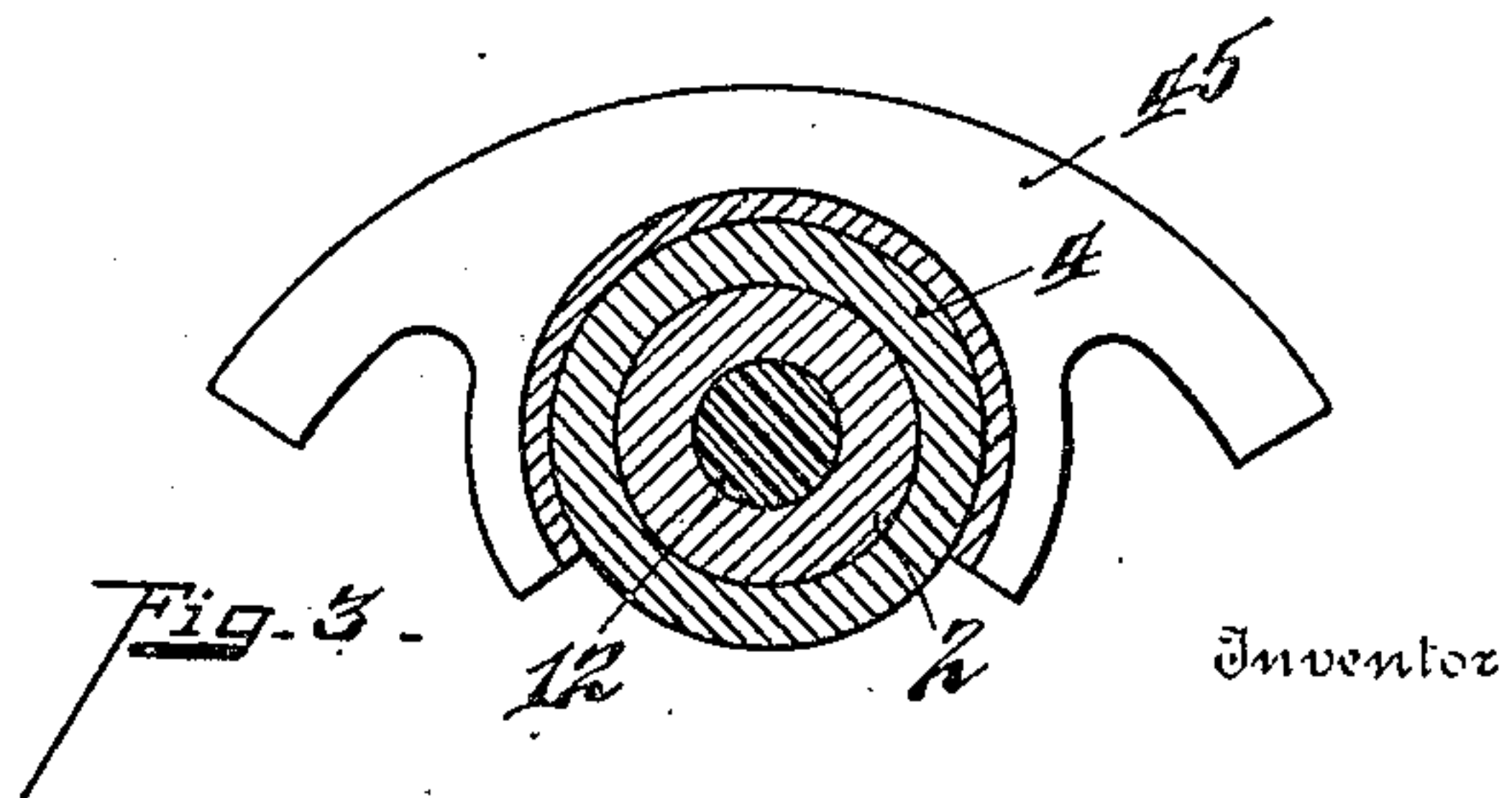
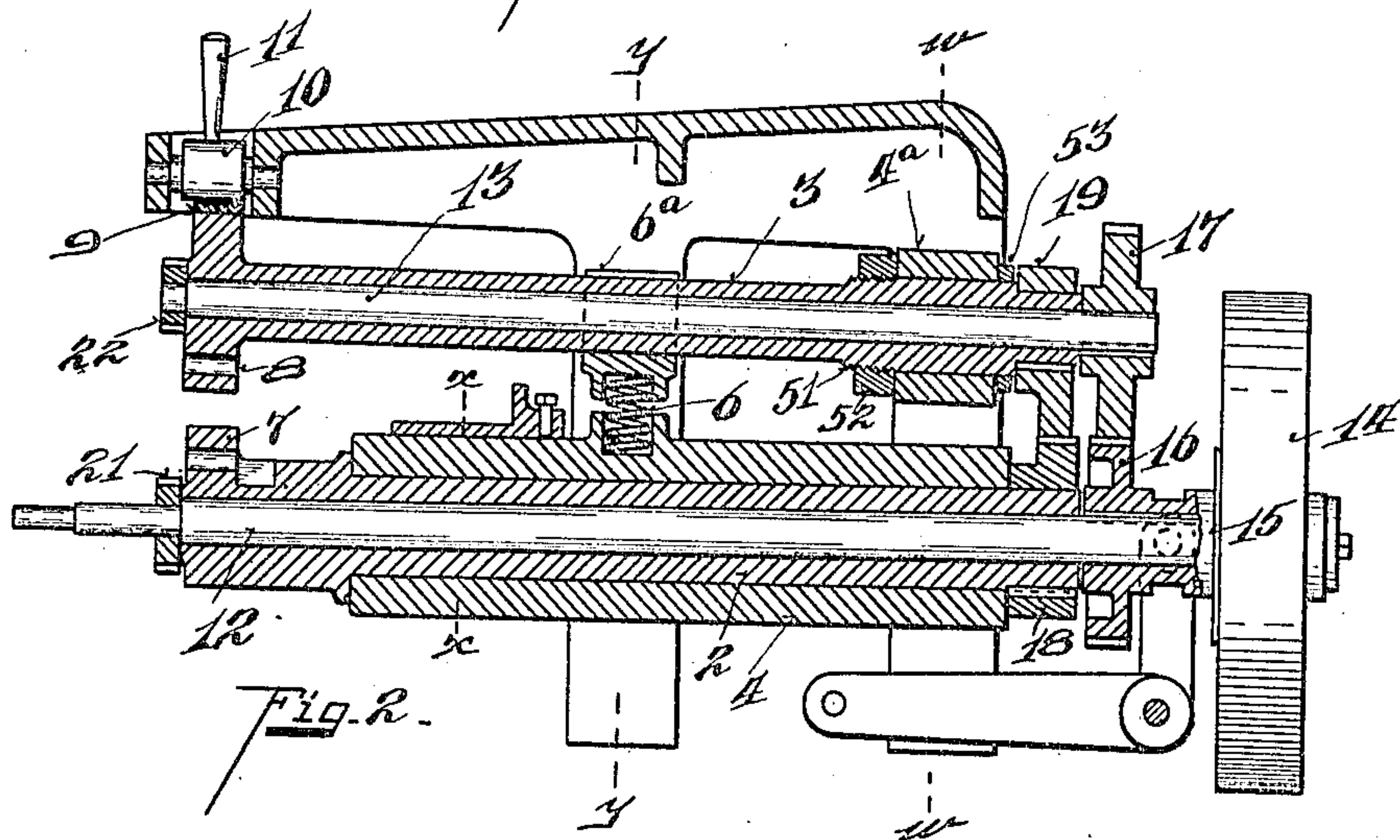
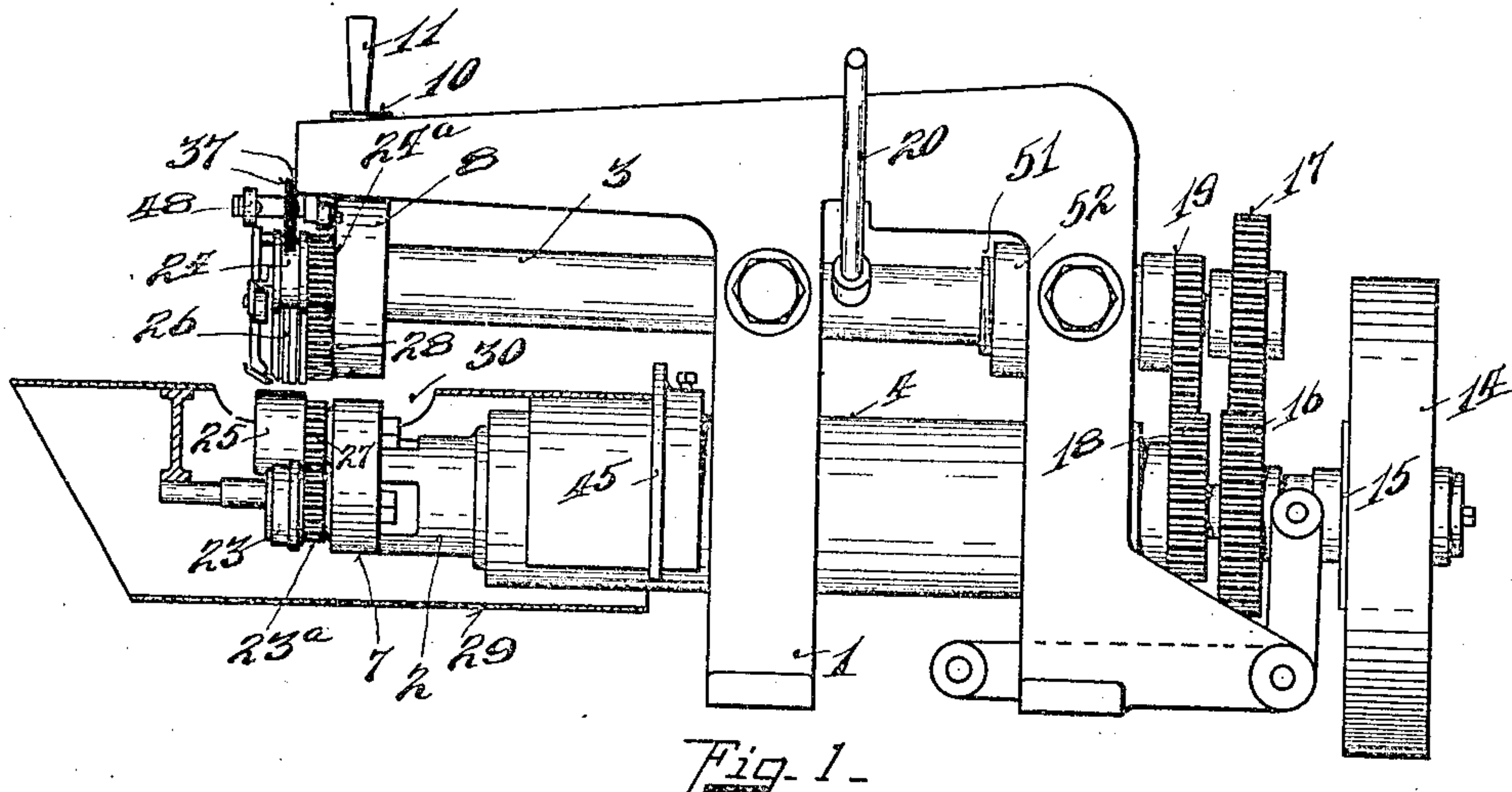


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MACHINE FOR FORMING PIPE JOINTS.  
APPLICATION FILED JUNE 4, 1908.

927,836.

Patented July 13, 1909.

3 SHEETS—SHEET 1.



Witnesses  
*Oliver B. Kaiser*  
*Arthur Faulhaber*

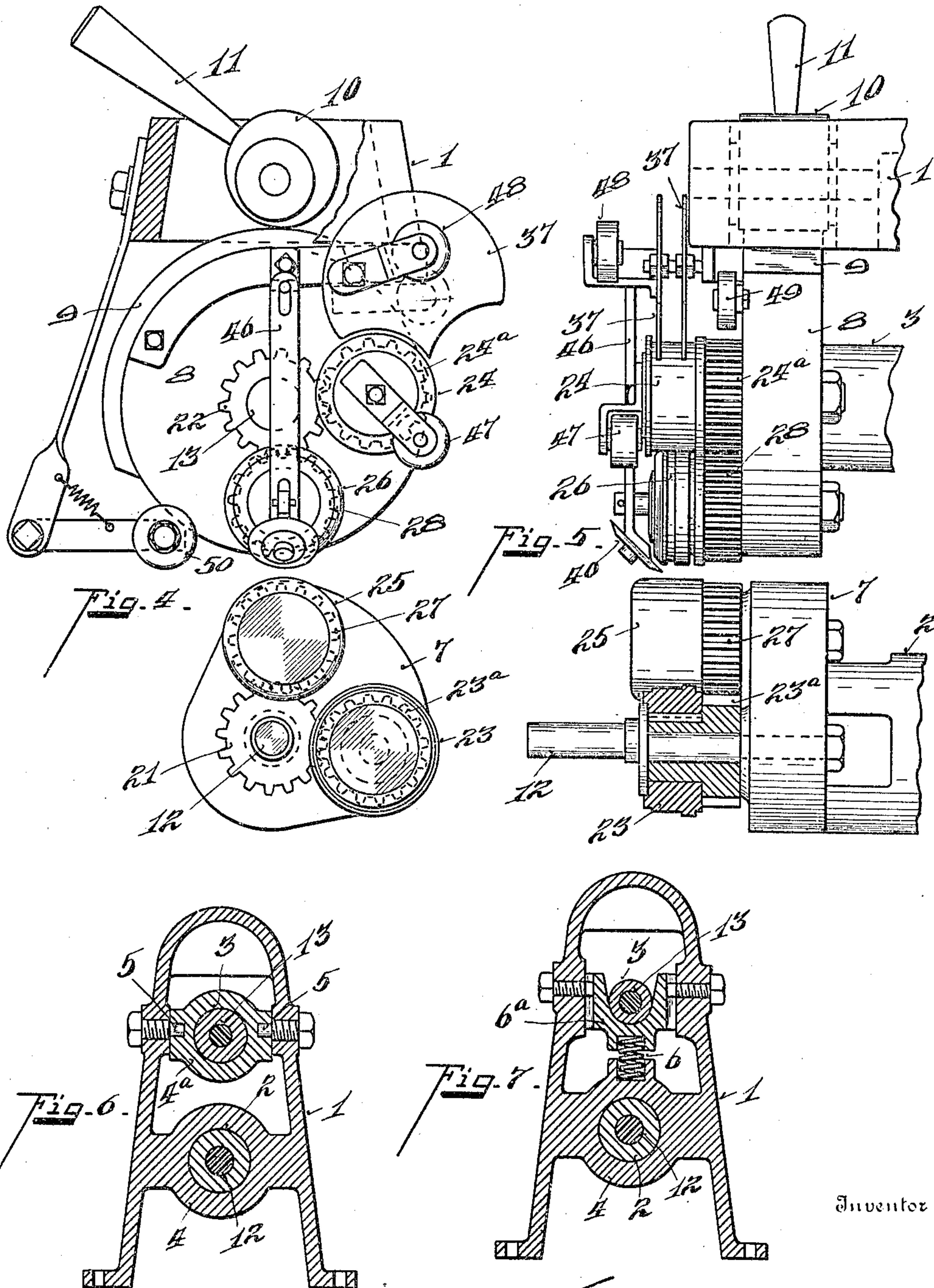
*Frank Deering*  
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Attorneys

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Inventor

Witnesses

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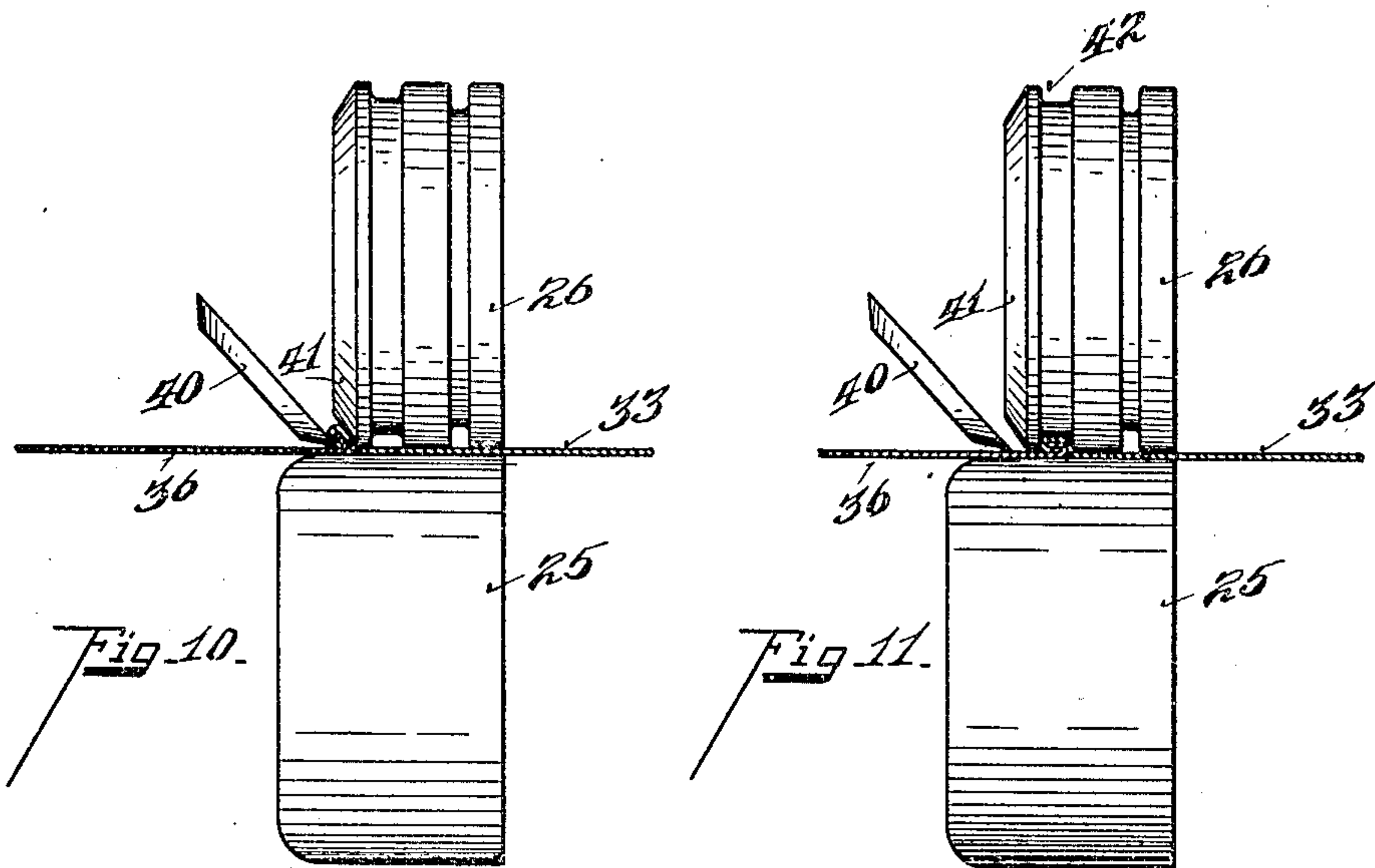
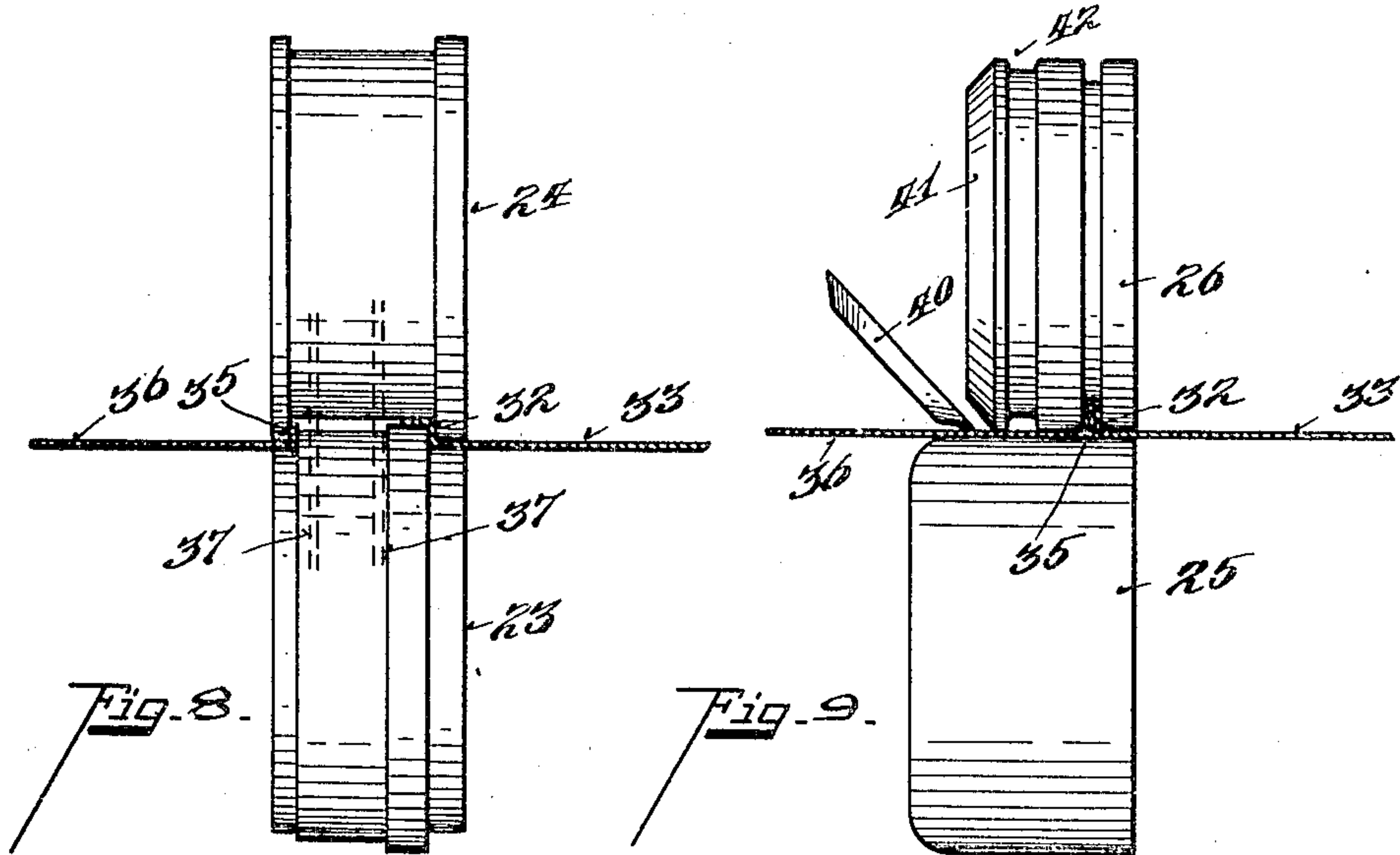


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3 SHEETS—SHEET 3.



Inventor

Witnesses

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# UNITED STATES PATENT OFFICE.

FRANK DEERING, OF COVINGTON, KENTUCKY, ASSIGNOR TO THE PECK, WILLIAMSON HEATING AND VENTILATING COMPANY, OF CINCINNATI, OHIO, A CORPORATION.

## MACHINE FOR FORMING PIPE-JOINTS.

No. 927,836.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed June 4, 1908. Serial No. 436,606.

*To all whom it may concern:*

Be it known that I, FRANK DEERING, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Machines for Forming Pipe-Joints, of which the following is a specification.

My invention relates to a machine for forming pipe joints.

The object of the invention is to provide a single machine for uniting the edges of pipe sections, the organization of the mechanism preferably permitting the joints to be formed consecutively so that the pipe may be formed, section upon section, of any desired length.

The features of my invention will be more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which:—

Figure 1 is a side elevation of my machine with the mandrel shown in section. Fig. 2 is a central vertical section through the same with the forming rolls omitted. Fig. 3 is an enlarged section on line *x, x*, Fig. 2. Fig. 4 is an enlarged front elevation of the heads carrying the forming rolls. Fig. 5 is a side elevation of the same. Fig. 6 is a section on line *w, w*, Fig. 2. Fig. 7 is a section on line *y, y*, Fig. 2. Figs. 8, 9, 10, and 11, illustrate the different forming rolls and steps of forming the pipe joints.

1 is the frame or headstock supported upon any suitable base, not shown.

2, 3, represent sleeves journaled in bearings, 4, 4<sup>a</sup>, the upper bearing 4<sup>a</sup> being pivoted at its inner end by means of pintles 5, see Fig. 6, permitting the outer end of sleeve 3 to be raised and lowered relative to the outer end of the lower sleeve 2, the joints being formed between these outer ends of the sleeves.

6 is a spring supported on lower bearing 4 at one end, the opposite end bearing against a yoke 6<sup>a</sup> straddling the sleeve 3, and pressing sleeve 3 normally upward.

7 represents a head on the outer end of the lower sleeve 2, and 8 represents a head on the outer end of the upper sleeve 3, the forming tools being mounted on these heads. Head 8 is provided with a yielding surface 9 against which cam 10 has a bearing. Cam 10 is pivoted to the frame 1 and has a handle 11

for depressing the upper sleeve to bring the forming tools into commission under manual controlled tension.

Within sleeve 2 is journaled main driving shaft 12, and 13 represents the driven shaft journaled in sleeve 3.

14 is a driving wheel on shaft 12, preferably brought into commission through clutch 15.

16, 17, represent gears connecting shafts 12 and 13.

18, 19, are segment gear members connecting sleeves 2, 3, for rocking them in either direction to bring the heads 7, 8, into and out of their several operative positions.

20 is a handle for rocking the sleeves.

Fixed upon the outer ends of shafts 12, 13, and adjacent to the outer faces of heads 7, 8, are the tool driving gear wheels 21, 22.

The forming tools consist of a coöperating pair of rolls 23, 24, journaled on heads 7, 8, having gear members 23<sup>a</sup>, 24<sup>a</sup>, engaging respectively gears 21, 22, for rotating the tools. 25, 26, is a second set of rolls journaled on heads 7, 8, respectively and having gears 27, 28, engaging gears 21, 22, respectively.

29 is a mandrel adjustably mounted on the bearing 4, having a cut out orifice 30 adjacent to head 7.

The first pipe section is placed on the mandrel with its inner edges placed against the stop gage 45, with its outer end between the tools, the second section is placed over the mandrel with its inner end between the tools. The rolls 23, 24, have at their inner edges die formations adapted to form the double right angle flange 32 on the outer edge of the inner pipe section 33. These rolls also have at their outer edges die formations adapted to form the right angle flange 35 at the inner edge of the outer section 36, these sections being brought into the position shown in Fig. 8, and the first set of rolls being brought into commission by uniting the sleeves 2, 3, appropriately. The proper position of the opposing ends of the pipe sections relative to one another and to the forming tools is fixed by engaging the ends of the pipe sections against gages 37, carried by head 8, see Figs. 4 and 5, dotted lines Fig. 8. The bends 32, 35, having been formed, the rollers are rolled to separate tools 23, 24, the flange



35 is then placed under flange 32, and the second set of rollers 25, 26, are brought into commission by rocking the rollers and swinging the heads 7, 8, into position. Rolls 25, 26, have die formations for bending the horizontally extending edge of the flange 32, down over the vertical edge of flange 35 forming the upstanding head of three-ply metal. The tools are then separated and this three-ply head is placed between the inclined bevel roller 40, the bevel 41 of roller 26, and the face of roller 25, the rotation of the rollers tilting the head as shown in Fig. 10. The rolls are again separated and the tilted head is placed between die formation 42 of the same rollers, see Fig. 11, and the tilted head is flattened down and rolled upon the periphery of the pipe, the joint now being completed. The united sections may now be slipped outwardly from the mandrel, another section placed in the mandrel and the meeting edges of the pipe and the new sections united by repeating the operation. In like manner the pipe may be built up of any desired length.

The improvement is very simple, efficient in operation and easily and quickly manufactured. The making of any desired number of sections in a single machine is a great labor saver and materially cheapens the cost of the products and makes the joints absolutely uniform and perfect.

The beveled roller 40 is journaled upon a bar 46, said bar being loosely supported and having vertical movement, so as not to interfere with the downward pressing action of head 8 in bringing the die forming rolls into operative position.

47, 48, 49, represent guide rolls adapted to contact the periphery of the pipe to prevent the same from buckling as the ends of the pipe sections are formed and joined. 50 represents a guide roll yieldingly mounted, contacting the periphery of the pipe section, in rear of the forming rolls.

The sleeve 3 is provided with means for adjusting the same to bring the heads 7, 8, and forming rolls into operative position and is accomplished as follows:—The sleeve 3 is screw threaded at 51 and provided with an adjusting nut 52 adapted to bear against the bearing 4<sup>a</sup>. 53 represents a collar bearing against the opposite face of the bearing 4<sup>a</sup>, whereby the sleeve 3 is locked in its adjusted position. By this means the forming rolls can be delicately adjusted relatively to each other.

The seam formed by my machine is an interlocking hook joint in character and the

union is so effective that the pipe sections are practically integral.

The forming of a pipe of any desired length on a single machine is of great practical advantage as a labor and money saver.

Having described my invention, I claim:—

1. A machine for forming pipe joints comprising a pair of rotatable shafts, having gears on their outer ends, a pair of sleeves rotatably mounted on the shafts, two or more pairs of forming rolls journaled at the ends of the sleeves and driven by the gears on the end of said shafts, and means for rotating said sleeves to bring the said rolls sequentially into operation to form the bending steps, substantially as described.

2. In a machine for forming pipe joints, the combination of driving shafts, rotatable sleeves thereon, two pairs of forming rolls held by the sleeve, transmission mechanism between the shafts and rolls, and means for rotating the sleeves to bring the rolls sequentially into operation upon the opposing ends of pipe sections held between the rolls, substantially as described.

3. A machine for forming pipe joints, comprising rotatable heads, two or more pairs of rolls on the heads, having die formations adapted to sequentially bend the ends of the pipe sections, means for rotating the rolls, means for rotating the heads to bring the rolls into and out of operation, and means for rocking one of the heads to and from the other, substantially as described.

4. A machine for forming pipe joints, comprising rotatable heads, two or more pairs of forming rolls on each head adapted to sequentially bend and unite the meeting ends of the pipe sections held between the cooperating rolls, means for rotating the rolls and for rotating the heads, substantially as described.

5. In a machine for forming pipe joints, the combination of driving shafts, rotatable sleeves thereon, two pairs of forming rolls held by the sleeves, transmission mechanism between the shafts and rolls, and means for rotating the sleeves to bring the rolls sequentially into operation upon the opposing ends of pipe sections held between the rolls, and means for adjusting one of said sleeves laterally relative to the other for alining the forming rolls, substantially as described.

In testimony whereof, I have hereunto set my hand.

FRANK DEERING.

Witnesses:

OLIVER B. KAISER,  
LEO J. O'DONNELL.