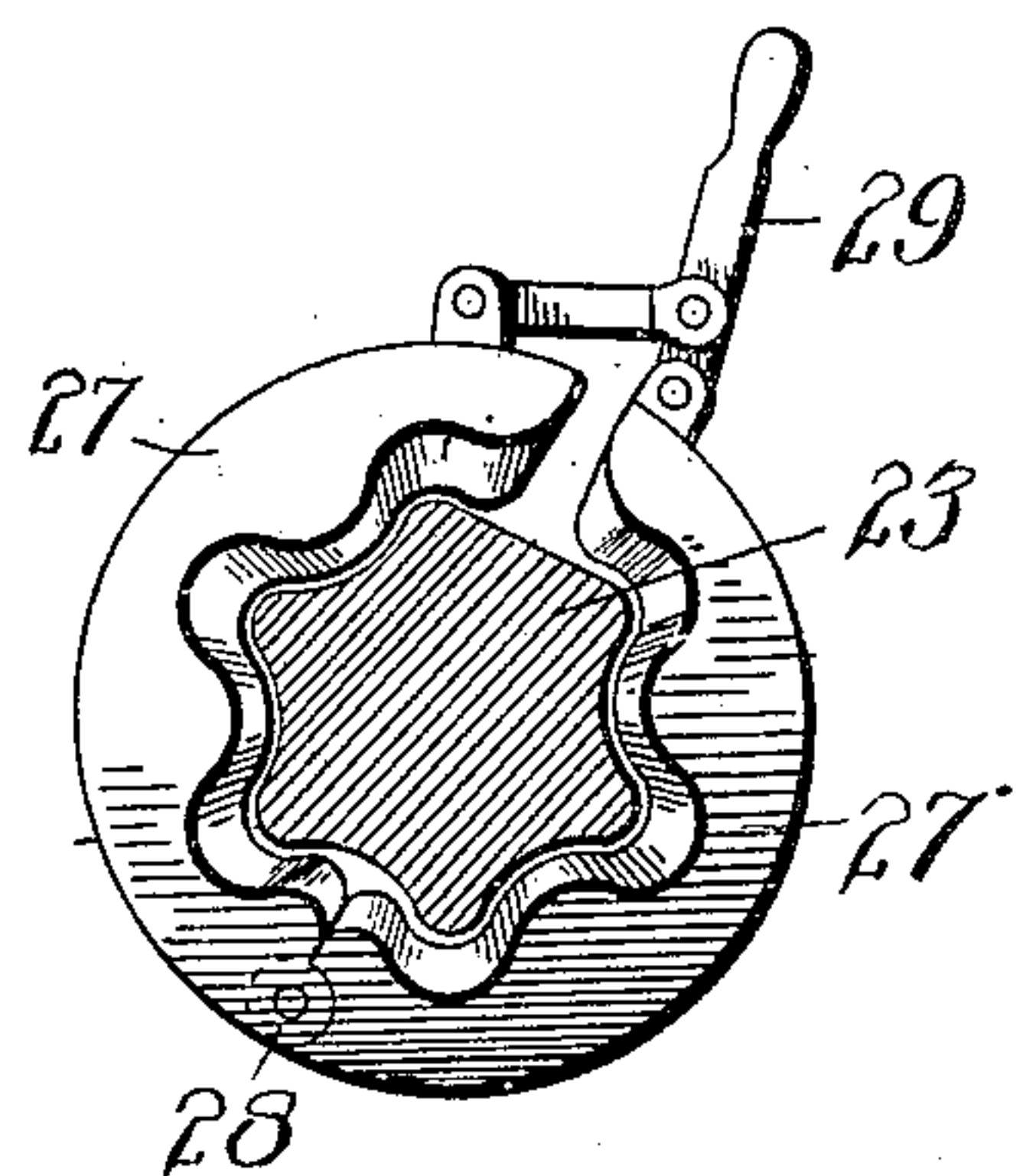
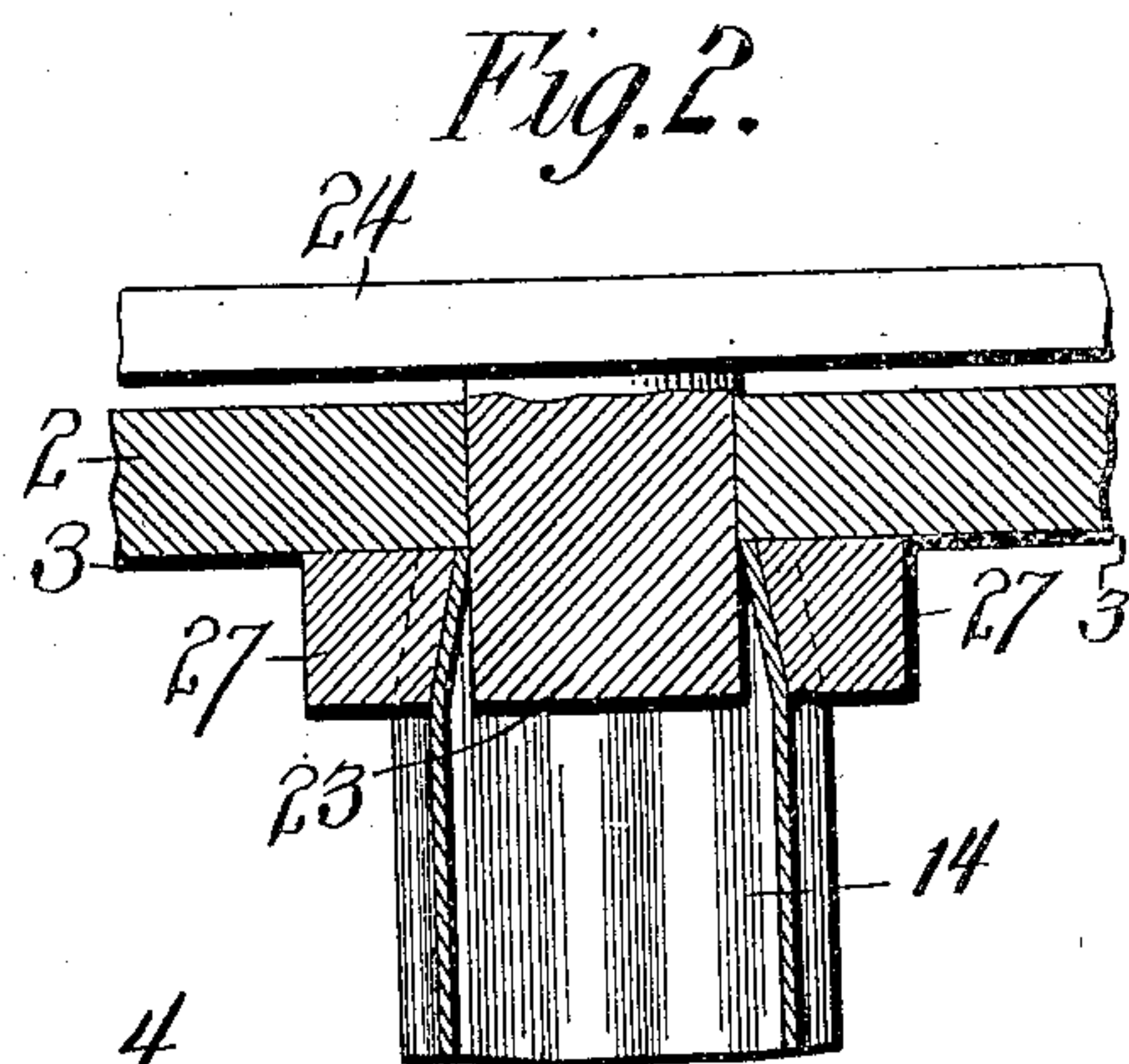
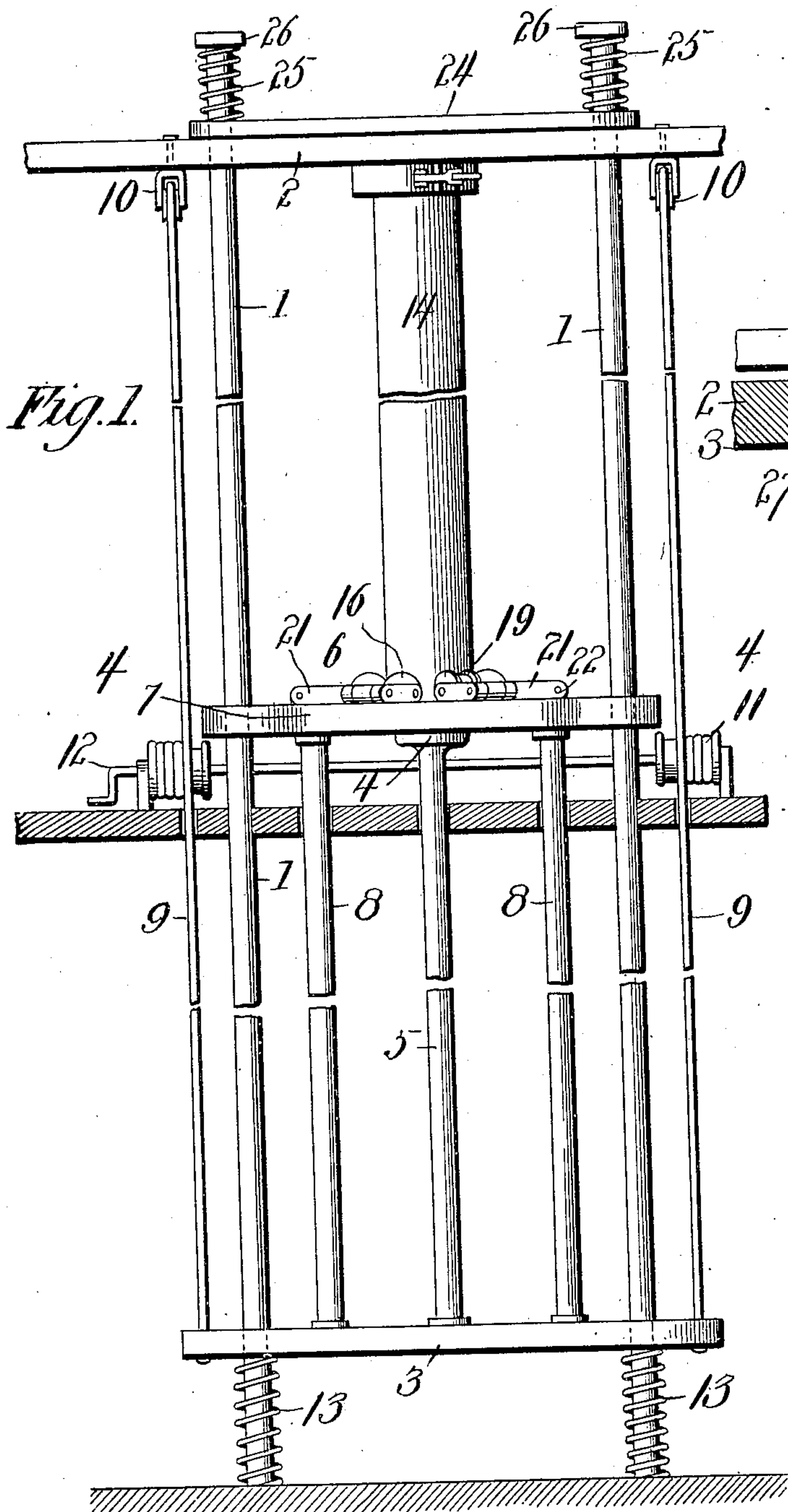


No. 832,001.

PATENTED SEPT. 25, 1906.

E. R. STASCH.  
TUBE CORRUGATING MACHINE.  
APPLICATION FILED MAY 5, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

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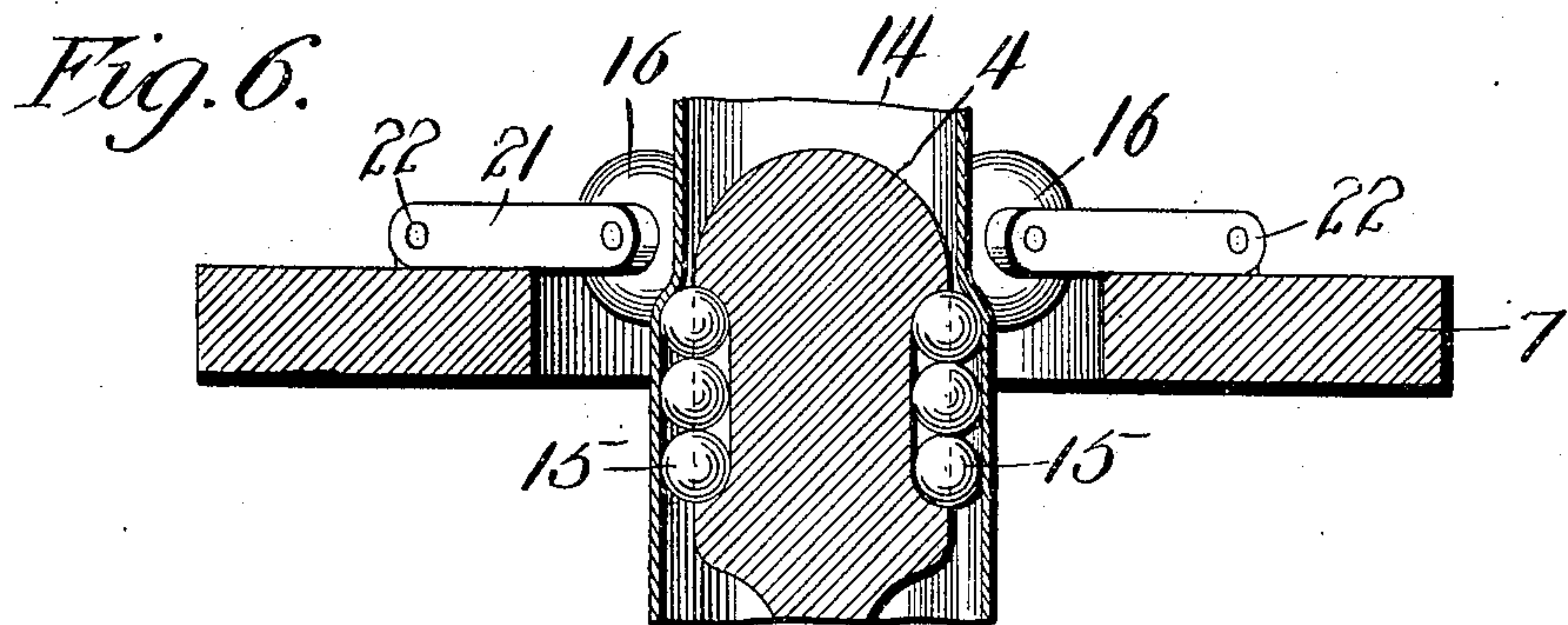
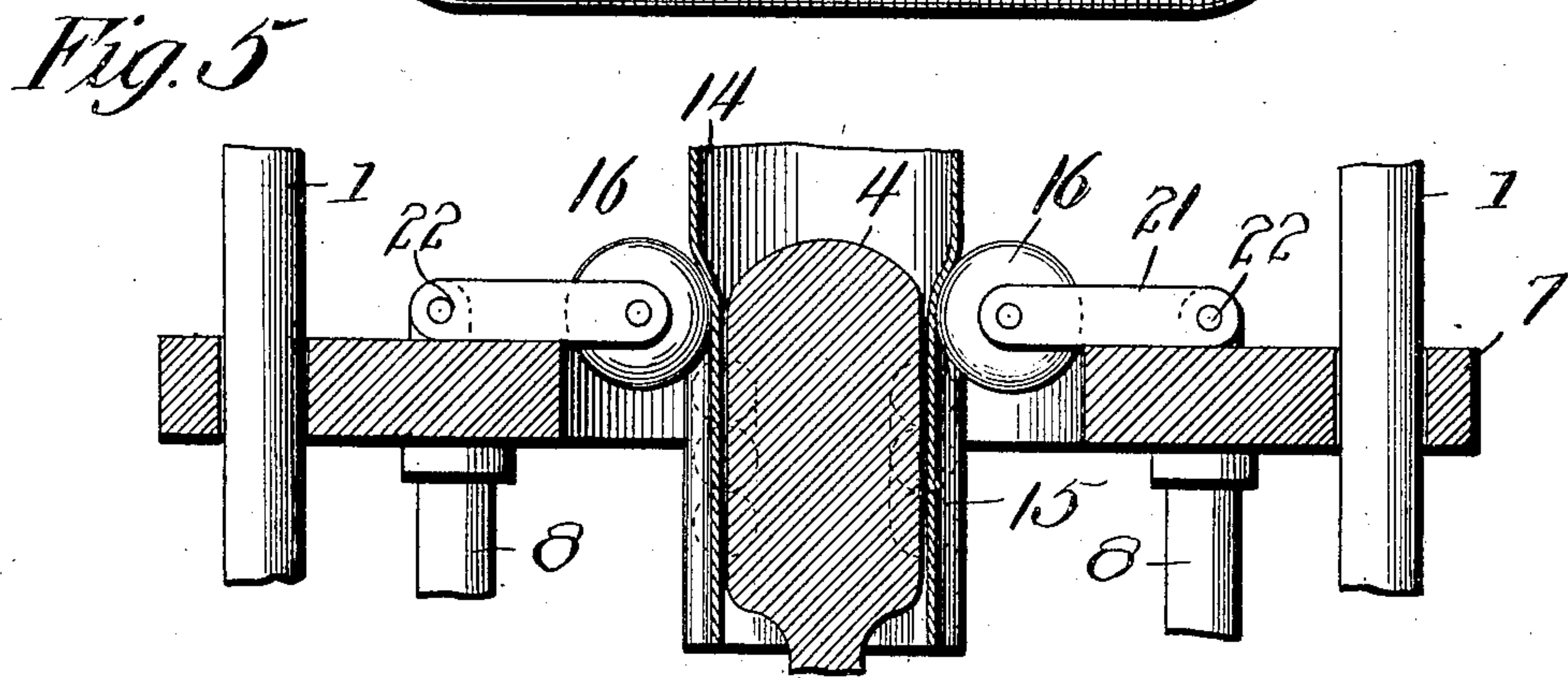
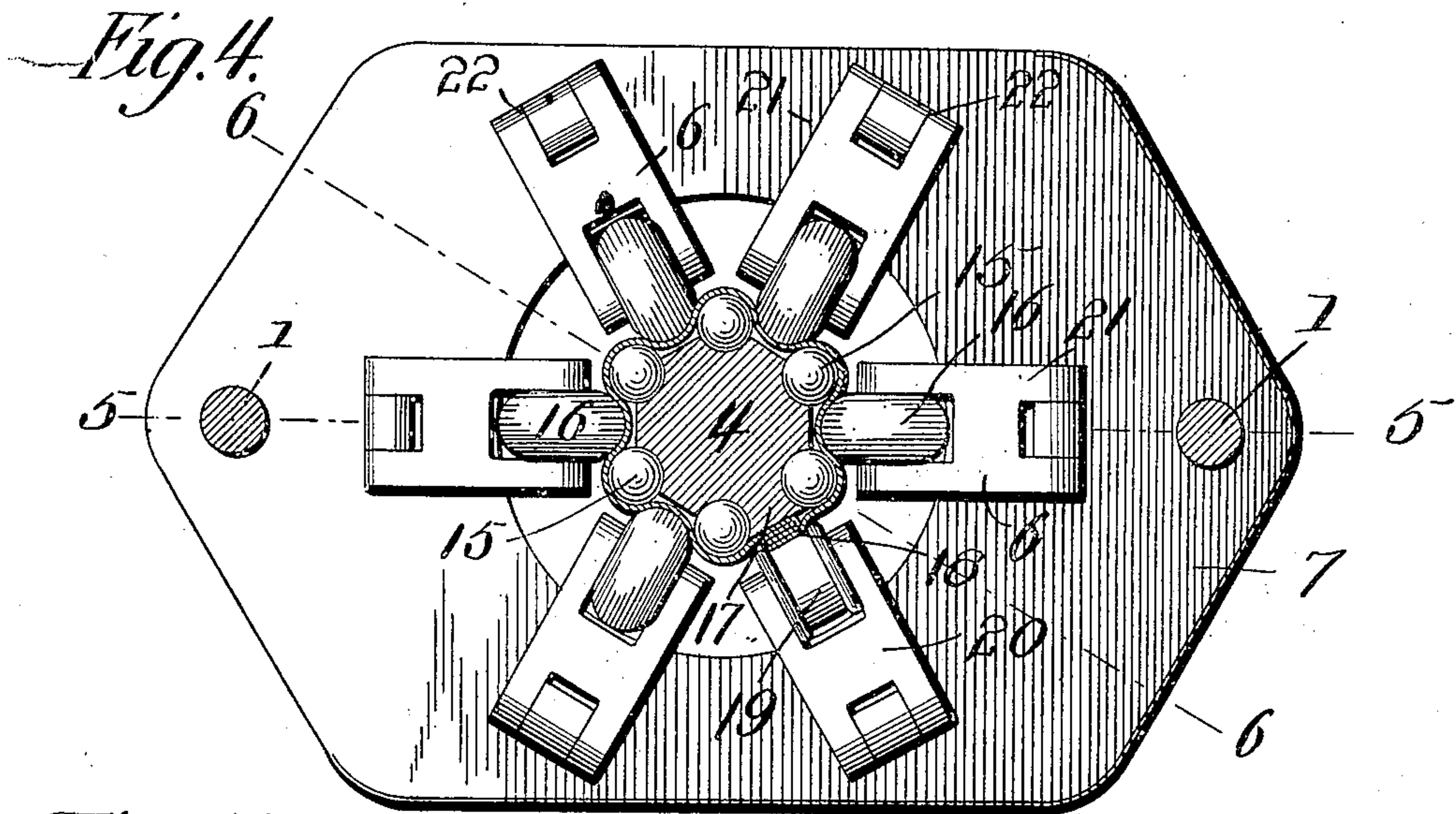
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~~WITNESSES:~~

W. F. Koyle.  
Alfred T. Sage

INVENTOR

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# UNITED STATES PATENT OFFICE.

EMIL R. STASCH, OF CORNING, NEW YORK.

## TUBE-CORRUGATING MACHINE.

No. 832,001.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed May 5, 1906. Serial No. 315,362.

*To all whom it may concern:*

Be it known that I, EMIL R. STASCH, a citizen of the United States, residing at Corning, in the county of Steuben, State of New York, have invented certain new and useful Improvements in Tube-Corrugating Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to a tube-corrugating machine, and particularly to a structure involving a traveling mandrel and corrugating-rollers adapted to traverse the length of the tube or pipe to be corrugated.

15 The invention has for an object to provide an improved construction and arrangement of parts wherein the tube is held within a relatively fixed frame and the mandrel moves longitudinally over the tube and the cooperating corrugating means traverse the outer surface of the tube and are so mounted as to permit their easy withdrawal in the return movement of the mandrel after the corrugating has been completed.

20 A further object of the invention is to provide means by which the upper supported end of the tube may be crimped or tapered to correspond with the corrugations thereon and to permit its insertion in an adjacent section when assembled.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

35 In the drawings, Figure 1 is an elevation of the machine. Fig. 2 is a detail vertical section of the tube-supporting head. Fig. 3 is a horizontal section on the line 3-3, Fig. 2. Fig. 4 is an enlarged section on the line 4-4, Fig. 1. Fig. 5 is a vertical section on the line 5-5, Fig. 4; and Fig. 6 is a similar section on the line 6-6, Fig. 4.

45 Like numerals of reference indicate like parts throughout the several views of the drawings.

50 The numeral 1 designates standards or supporting-rods, which may be disposed either in a horizontal or vertical position, as found most convenient, and are here shown as disposed in a vertical position, which has been found desirable in the use of the invention. These rods are provided at one end with a fixed cross-bar 2, connecting the same, and slidingly mounted upon the rods 1 is the carriage 3 for supporting the mandrel 4, which is provided with the stem 5, extending

back to the carriage. Cooperating corrugating-rollers 6 or other means for that purpose are supported upon a cross-frame 7 connected with the carriage 3 by means of the rods 8, 60 so as to travel therewith upon the supporting-rods 1. Any desired means may be used for producing the travel of this carriage—for instance, cables 9 extending from the carriage over suitable pulleys 10, carried by the cross-bar 2, and thence to winding-drums 11, carried by the shaft 12 for operating the same. 65 For the purpose of permitting the introduction of the tube upon the mandrel 4, the carriage is supported upon springs 13 at one end, 70 so that it can be withdrawn to permit the introduction of the tube 14 in position, when it will automatically return to engage the end thereof and support it in its centered relation.

The corrugating means comprise a series of 75 balls or rollers 15, mounted in any suitable manner in the mandrel 4 and at suitable intervals apart to provide the necessary space to receive the cooperating corrugating devices 6 which in the present instance are 80 shown as rollers 16, so disposed as to force the material of the tube inward toward the mandrel between each of the series of balls 15 thereon. The mandrel is also provided with a flat face 17, upon which the seam 18 85 of the tube is adapted to be disposed, and this seam is closed and properly finished by means of the seaming-roller 19, mounted in the pivoted carrier 20 upon the cross-frame 7. Each of the rollers 16 is similarly mounted 90 in the carriers 21, these several carriers having their pivots 22 at their ends farthest from the mandrel 4, so that in the return of the carriage with the mandrel the carriers are adapted to swing outward, so as to remove 95 any frictional contact of the rollers with the tube.

At one end of the machine a supporting-head 23 is provided, over which the tube is placed when inserted, this head being carried 100 by a frame 24, mounted at its opposite ends to slide upon the rods 1 and held in contact with the cross-bar 2 by means of the tension-springs 25, extending between the frame and the caps 26, carried by the rods. This holding-block may be corrugated to correspond 105 with the mandrel, as shown in Fig. 3, and is adapted to cooperate with the crimping-jaws 27 of any desired character, which are secured upon the inner face of the cross-bar 2— 110 for instance, as shown in Fig. 3, where they are pivoted together at 28 and provided with



a closing mechanism, as indicated at 29, so as to engage the end of the tube and bring it into contact with the head-block 23, thus completing the corrugation thereof and also tapering the same inwardly, so as to fit within the cooperating section.

In the operation of the invention the tube to be corrugated is inserted in the machine, so that one end embraces the head 23, while the carriage is withdrawn against the tension of the springs, so as to permit the mandrel to enter the opposite end of the tube with the corrugating-rollers in the position shown in Figs. 5 and 6. The springs now hold the parts in their adjusted position relative to the tube, and the power is applied so as to cause the corrugating devices to traverse the length of the tube, and as they approach the opposite end thereof the mandrel strikes the head 23, forcing the same backward away from the tube, so as to carry the corrugations as near as possible to the end of the tube. The complete corrugating to the end of the tube cannot be accomplished, owing to the position of the rolls, and for this purpose the crimping device is provided and after the withdrawal of the corrugating means is closed upon the tube to continue the corrugation thereof up to the end and force said end slightly inward to produce a tapered structure. The crimping device is then released and the carriage completely withdrawn, so as to allow the ready removal of the tube from the mandrel. It will be seen that this invention provides a simple, efficient, and economical construction of machine for effecting the corrugation of tube-sections.

Having now described my invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. In a tube-corrugating machine, tube-supporting means, a carriage, a mandrel carried by said carriage, and cooperating corrugating devices supported from said carriage to traverse the outer surface of the tube in fixed relation to the traveling mandrel.

2. In a tube-corrugating machine, tube-supporting means, a carriage, a mandrel carried by said carriage, cooperating corrugating devices supported from the carriage to traverse the outer surface of the tube in fixed relation to the traveling mandrel, and pivoted carriers for said devices to permit their movement away from the mandrel in one direction of travel of the carriage.

3. In a tube-corrugating machine, tube-supporting means, a carriage, a mandrel carried by said carriage, cooperating corrugating devices supported from the carriage to traverse the outer surface of the tube in fixed relation to the traveling mandrel, and a crimping device adapted to embrace the supported end of the tube toward which the mandrel travels.

4. In a tube-corrugating machine, tube-

supporting means, a carriage, a mandrel carried by said carriage, cooperating corrugating devices supported from the carriage to traverse the outer surface of the tube, a crimping device adapted to embrace one supported end of the tube, a head adapted to enter said supported end, and means for yieldingly supporting said head in position.

5. In a tube-corrugating machine, tube-supporting means, a carriage, a mandrel carried by said carriage, cooperating corrugating devices supported from the carriage to traverse the outer surface of the tube, and means for yieldingly forcing said carriage toward the tube-holding means.

6. In a tube-corrugating machine, supporting-rods provided with a cross-head, a tube-support carried by said cross-head, a carriage slidingly mounted upon said rods, a mandrel provided with a stem mounted upon said carriage, and cooperating corrugating-rolls supported from the carriage to travel with said mandrel.

7. In a tube-corrugating machine, supporting-rods provided with a cross-head, a tube-support carried by said cross-head, a carriage slidingly mounted upon said rods, a mandrel provided with a stem mounted upon said carriage, cooperating corrugating-rolls supported from the carriage to travel with said mandrel, a seaming-face upon said mandrel, and a seaming-roller cooperating with said face.

8. In a tube-corrugating machine, supporting-rods provided with a cross-head, a tube-support carried by said cross-head, a carriage slidingly mounted upon said rods, a mandrel provided with a stem mounted upon said carriage, cooperating corrugating-rolls supported from the carriage to cooperate with said mandrel, supporting-springs for said carriage carried by one end of the supporting-rods, and means for actuating said carriage upon said rods.

9. In a tube-corrugating machine, supporting-rods provided with a cross-head, a tube-support carried by said cross-head, a carriage slidingly mounted upon said rods, a mandrel provided with a stem mounted upon said carriage, cooperating corrugating-rolls supported from the carriage to cooperate with said mandrel, supporting-springs for said carriage carried by one end of the supporting-rods, means for actuating said carriage upon said rods, a yieldingly-supported head carried by the rods at the opposite end from the carriage, and a corrugating device surrounding said head.

10. In a tube-corrugating machine, supporting-rods provided with a cross-head, a tube-support carried by said cross-head, a carriage slidingly mounted upon said rods, a mandrel provided with a stem supported upon said carriage, cooperating corrugating-rolls supported from the carriage to cooperate



ate with said mandrel, supporting-springs  
for said carriage carried by one end of the  
supporting-rods, means for actuating said  
carriage upon said rods, a yieldingly-sup-  
5 ported head carried by the rods at the oppo-  
site end from the carriage, cooperating cor-  
rugating-jaws having inclined inner faces ad-  
jacent to said head, and means for moving  
said jaws toward and from the head.

10 11. In a tube-corrugating machine, a car-  
riage, a mandrel carried thereby and pro-  
vided with longitudinally-disposed series of  
balls mounted thereon, and cooperating  
15 rollers supported by the mandrel-carriage  
intermediate each series of balls.

12. In a tube-corrugating machine, a tube-  
support, a carriage, a mandrel supported  
upon said carriage, cooperating corrugating  
devices to traverse the outer surface of a  
tube, and carriers for said devices pivotally 20  
mounted upon the carriage so as to contact  
therewith during the corrugating action and  
to swing therefrom in the return movement.

In testimony whereof I affix my signature  
in presence of two witnesses.

EMIL R. STASCH.

Witnesses:

F. C. WILLIAMS,  
W. J. CHENEY.