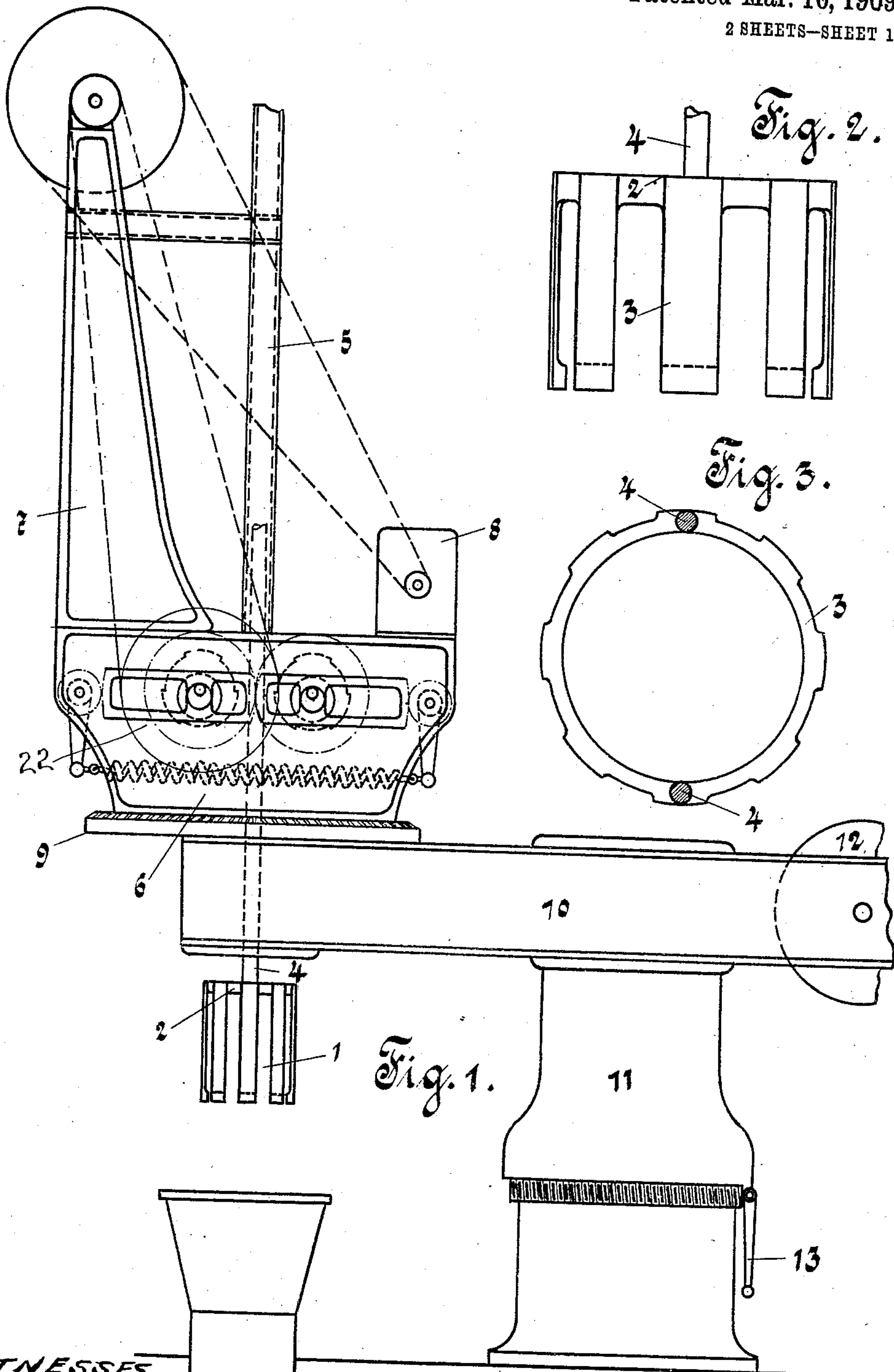


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APPLICATION FILED FEB. 27, 1906.

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Patented Mar. 16, 1909.
2 SHEETS—SHEET 1.



WITNESSES
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W. J. Rowan

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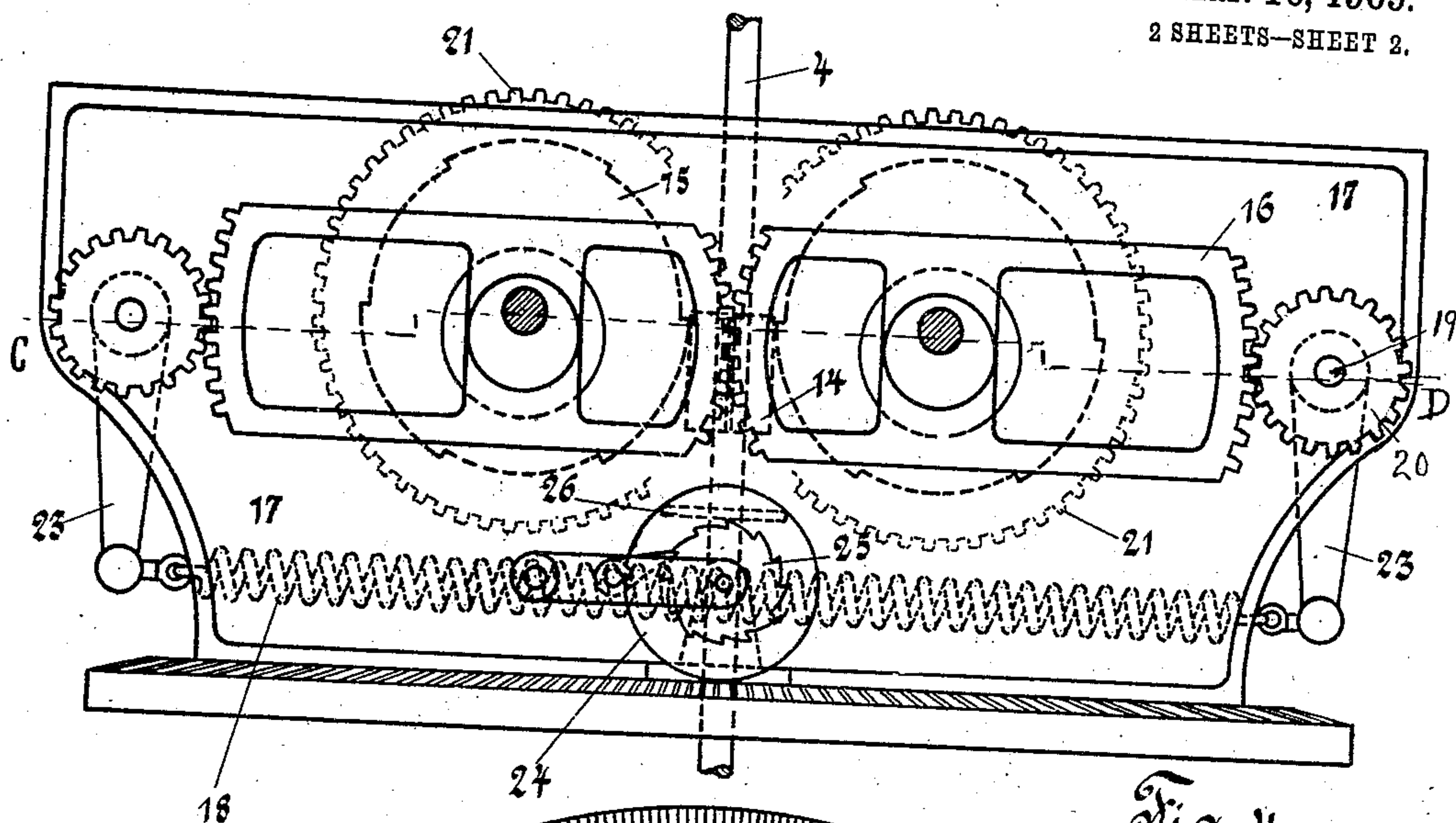


Fig. 4.

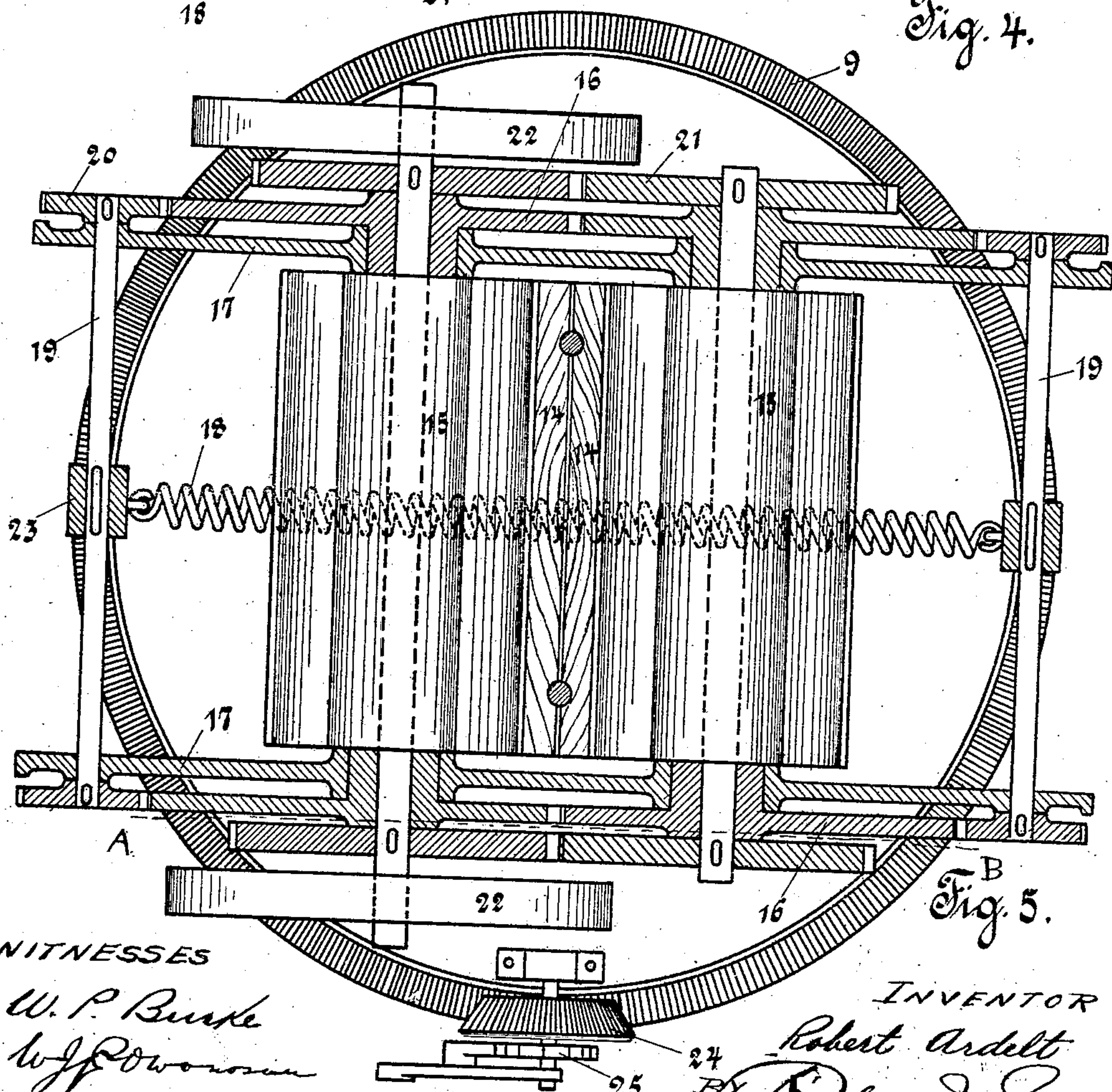


Fig. 5.

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UNITED STATES PATENT OFFICE.

ROBERT ARDELT, OF WETZLAR, GERMANY.

PIPE-MOLDING MACHINE.

No. 915,323.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed February 27, 1906. Serial No. 303,232.

To all whom it may concern:

Be it known that I, ROBERT ARDELT, a subject of the Emperor of Germany, and resident of Wetzlar, Germany, have invented a certain new and useful Improvement in Pipe-Molding Machines, of which the following is a specification.

In stamping machines for forming pipe molds it has heretofore been usual to employ bell-shaped rammers which entirely inclosed the pipe pattern and the length of which had therefore to be somewhat greater than that of the pattern. This arrangement occasioned serious disadvantages chiefly due to the fact that the driving mechanism for the rammer had to be mounted at a relatively large distance above the opening of the molding box so as to make room for the rammer throughout its length between said two parts. If it be further taken into account that for each rammer a guide has to be provided which is likewise of the same length as the rammer then the total height of the machine must be at least double the length of the pipe. With the common lengths of piping, about 4 meters, there must therefore be a space of 8 meters free above the molding box opening. The great distance of the driving mechanism above the molding box opening and on the other hand the relatively large weight of the rammer further cause the adjustment of the rammer above the molding box to be accompanied by considerable difficulties and loss of time, a circumstance which becomes very important in the production of pipes on a large scale. In order now to avoid these inconveniences under the present invention instead of a bell shaped rammer a short annular shaped rammer is employed, the height of which is only dependent upon conditions of rigidity and production. This annular rammer is further connected with actuating rods which are mounted in the interior space of the mold to be stamped so that they need not be taken into account in determining the height of the driving mechanism above the mold box opening. The same is dependent only on the short height of the rammer. With this arrangement there are thus avoided the above mentioned disadvantages inherent to constructions with long rammers so that not only is it possible to set up the stamping machine with relatively slight weight but also to increase the output of the same, which again is very important in production on a

large scale. It is also to be remembered that in unit time the rammer can make a larger number of strokes than heavy rammers. In order to attain this result the driving mechanism is provided with automatic means for regulating the stroke of the rammer. A regular stamping out of the mold is obtained by causing the rammer to turn slightly after each stroke. The molding-sand can always be filled-in from the mouth of the molding-box, the stamper being provided in the inner part of the box so as not to obstruct such filling-in.

The drawing shows one embodiment of the improved molding machine.

Figure 1 is an end elevation of the machine: Fig. 2 an elevation and Fig. 3 a plan of the rammer: Fig. 4 is a section on line A—B of Fig. 5 with the wheels 9 and 24 in elevation and Fig. 5 is a section on line C—D of Fig. 4.

As shown, the rammer 1 comprises a ring 2 which is provided with fingers 3. These are thickened at their lower ends in order to have as large an engaging surface as possible acting on the molding sand. In order also to be able to stamp the sand firmly at the lower end of the mold—the faucet end of the pipe—the fingers must spread apart somewhat on contact of the faucet piece with the pattern. They are therefore made of resilient material. Two of the fingers are prolonged above the ring in the form of actuating rods 4 which are made rigid relative to one another at their upper ends. By said rods the rammer is guided in the frame 5 above the actuating mechanism 6. The frame 17 which carries the latter is extended in a bracket 7 at the upper end of which are mounted belt pulleys or the like which transmit power from an electro motor 8 to the actuating mechanism. Besides the up and down movement the rammer also receives a rotation around its axis in order that all parts of the surface may be affected regularly, as the fingers only occupy a part of the surface. In order to effect this rotary movement the driving mechanism is rotatable on a toothed wheel 9 which is slidable on the supporting beam 10 of a frame 11 rotated by means of worm gear 13. The weight is balanced by a counter-weight 12.

The driving mechanism of the stamper which allows the stamping to fall by gravity consists of two wooden blocks or members 14 having recesses between their meeting faces for the driving rods. These blocks which

may be composed of material other than wood, if desired, are engaged by rollers 15. These rollers are in constant rotation, being driven through the power connections hereinafter described and they have raised and depressed portions so that as they revolve the raised portions will grip the blocks 14 between them and lift the said blocks, this action continuing until the depressed portions of the rollers come opposite the blocks, whereupon the lifting action ceases and the blocks will recede slightly from each other, thus releasing the driving rods 4 and allowing the same to fall by gravity. The rollers 15 are driven through the gears 21 on their shafts and the belt wheels 22 arranged on the shaft of one of said rollers. The shafts of the rollers find bearings eccentrically in journals or hubs of levers 16, the said journals or hubs of said levers 16 finding bearings in the frame members 17. These levers are provided with segmental racks at their adjacent ends meshing with each other and at their outer ends they are provided with segmental racks also which mesh with pinions 20 on the shafts 19 bearing in the frame 17, said shafts having the arms 23 thereon connected by the spring 18. The function of these levers 16 and the spring and connections described is to take up any wear which results from the operation of the high parts of the rollers against the blocks or members 14 in raising them for the stamping action, for it will be noticed that the journals of the rollers being eccentric in relation to the journals or hubs of the segmental levers, will be moved toward each other and thus keep the peripheries of the rollers against the lifting blocks as the said blocks wear in the operation of the machine.

The pulleys 22 are driven from the motor 8. Engaging the toothed ring 9 is a bevel wheel 24 which is driven by a ratchet 25 of known construction and which effects the gradual rotation of the entire driving mechanism.

The device operates as follows:—The rollers 15 are driven by the electro motor 8. The said rollers engage the blocks at the larger parts of their circumference with the blocks and press the same against the rods 4 which they guide upward. The plate 26 limits the fall of cheek 14 so that it can again be seized by the next following raised parts of the roller. When the narrower parts of the rolls come in contact with the blocks the rammer is then free to fall while the blocks slide on the support 26 from which they are again taken up by the rollers. The spring 18 exercises a constant pressure on the rollers while the latter under the reaction of the blocks tend to turn outwardly around the

centers of the segments 16. The turning movements exercised by the spring and by the blocks are therefore equivalent. When the blocks are worn the rolls are moved together by the tension of the spring and always pressed with the same pressure against the blocks. As the ratio of transmission of the two lever arms from the middle of the toothed segment to the middle of the rolls (eccentrically) and on the other hand from the middle of the toothed segment to the arc of the outer teeth is large, a weak spring suffices to obtain the required pressure.

Having now described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. A stamping machine for pipe molds comprising a stamper of cylindrical form and having both ends open, said stamper consisting of a ring, fingers integral with said ring and projecting downwardly therefrom, said fingers being spaced apart and having their lower ends enlarged, a pair of rods secured to the ring at diametrically opposite points thereon and extending upwardly therefrom, means above the stamper engaging with the rods for alternately raising the stamper and allowing it to fall by gravity and means for rotating the rods and stamper, there being a plurality of fingers so proportioned with respect to the intervening spaces as to cause the ends of the fingers to stamp the entire surface of the sand with a minimum of rotary movement, substantially as described.

2. A stamping machine for pipe molds comprising cylinders, having raised and depressed portions on their peripheries, a stamper, two driving rods connected to the stamper, and a pair of cheeks surrounding the rods and engaged by the cylinders and means for rotating the cylinders to cause the cheeks to alternately grip and release the rods.

3. A stamping machine comprising a stamper, rods projecting upwardly therefrom, a pair of cheeks surrounding said rods, cylinders having raised and depressed portions on their peripheries engaging with the cheeks, bearings in which the cylinders are eccentrically mounted, toothed segments carrying said bearings, pinions engaging with the segments, an arm connected to each pinion and a spring connecting the free ends of the arms together.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT ARDELT.

Witnesses:

HANS EYCK,
JEAN GRUND.