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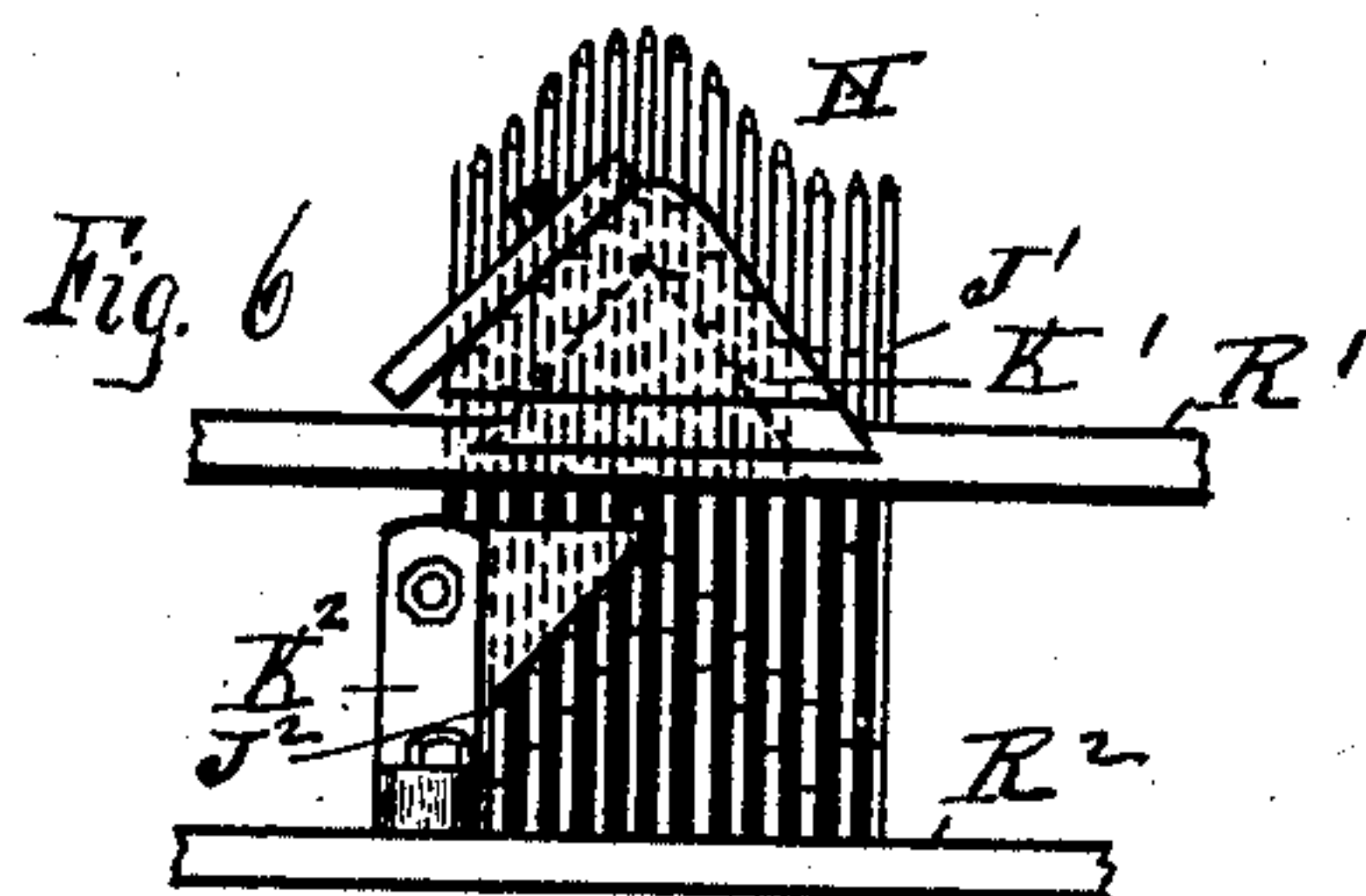
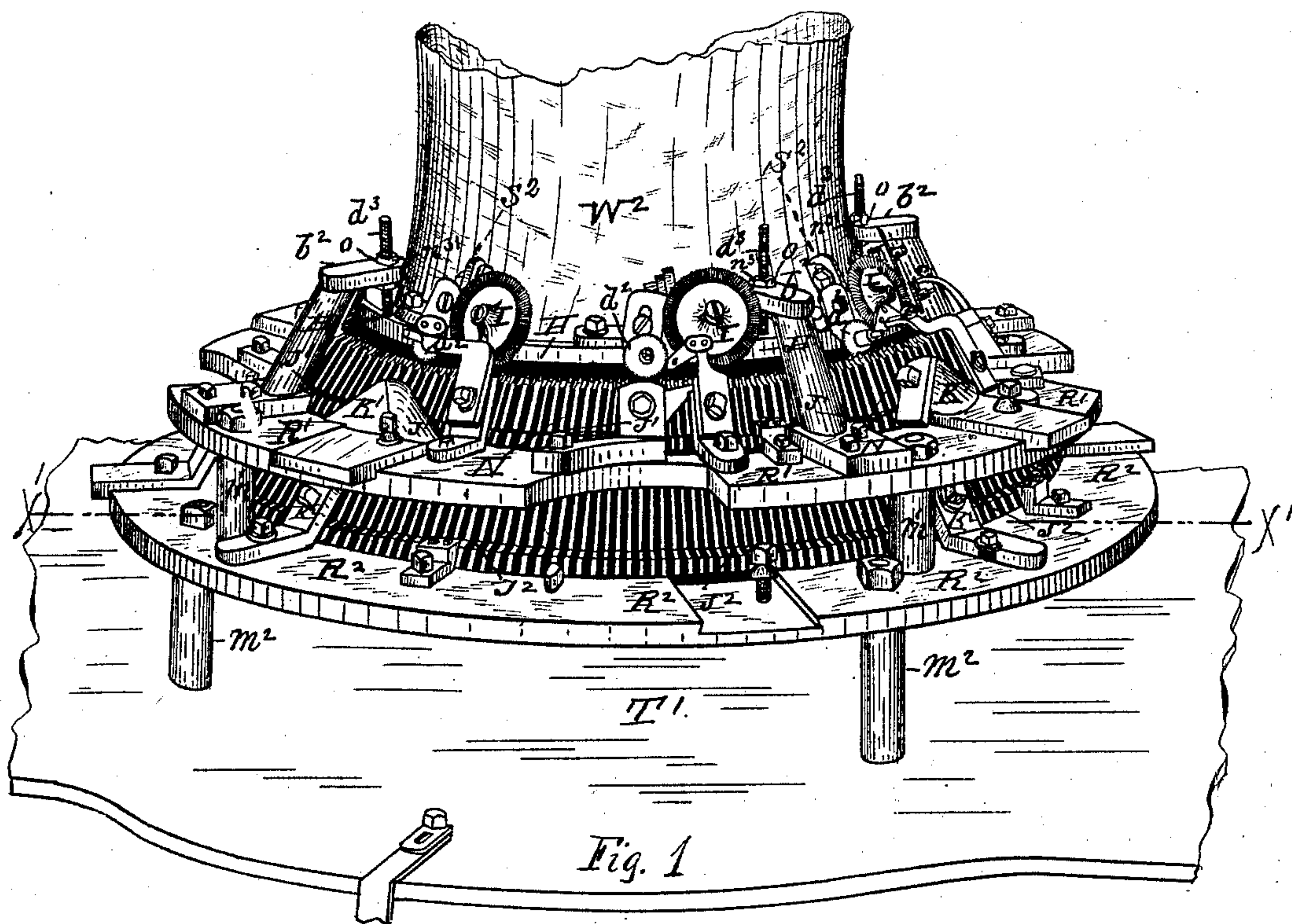
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E. VERMILYEA.

CIRCULAR KNITTING MACHINE.

No. 395,764.

Patented Jan. 8, 1889.



WITNESSES

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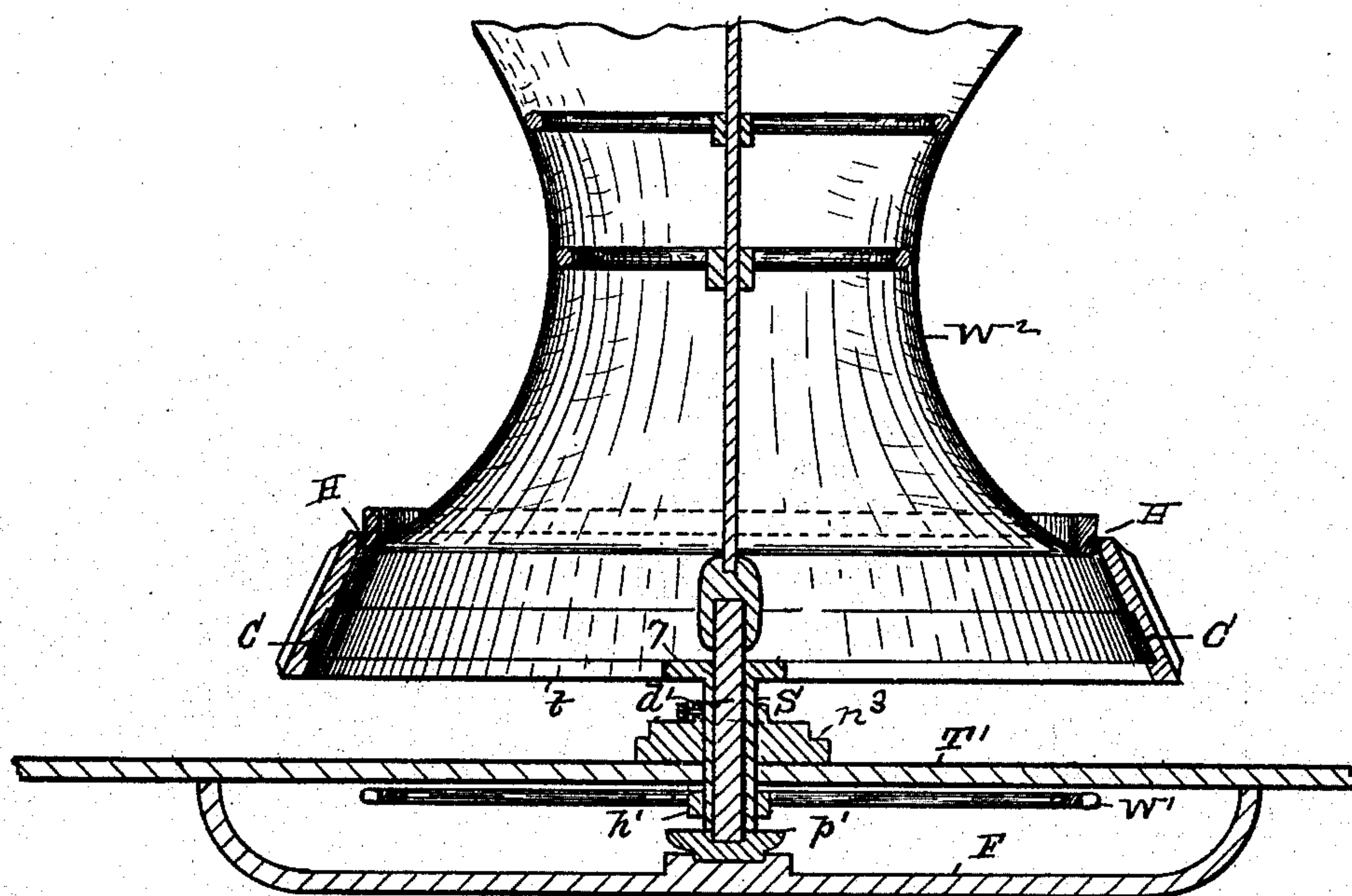


Fig. 2

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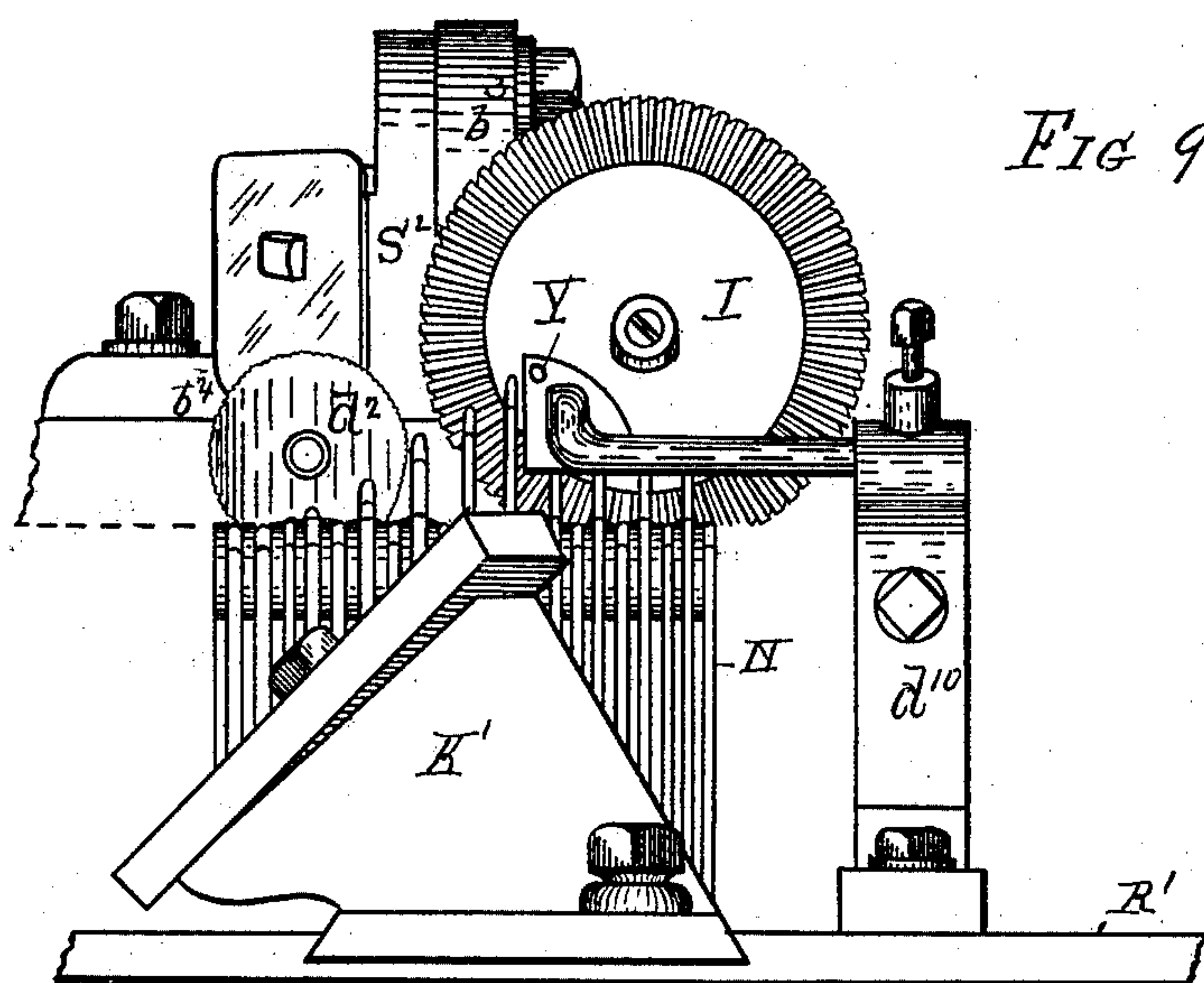


Fig 9

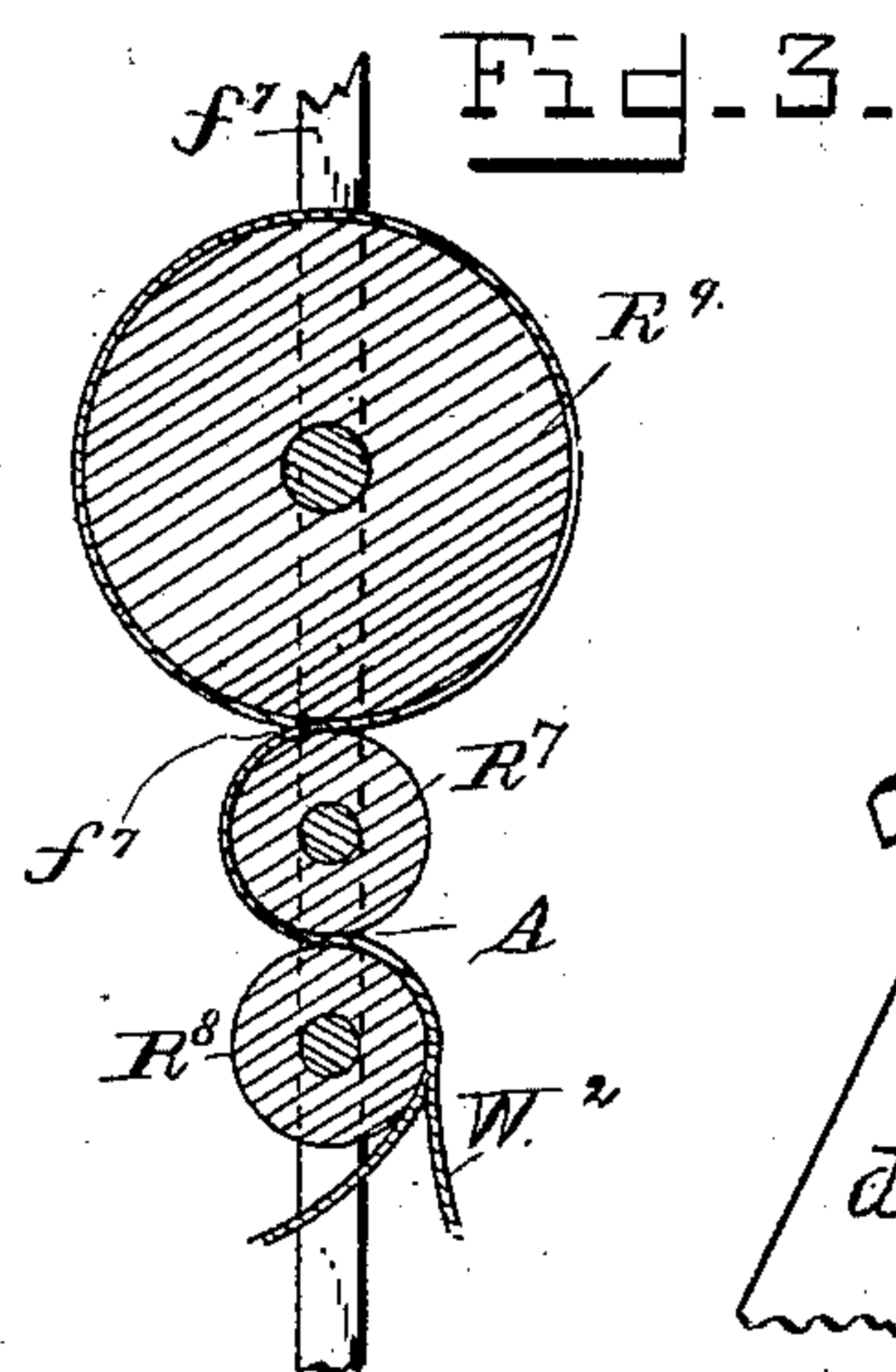


Fig 3.

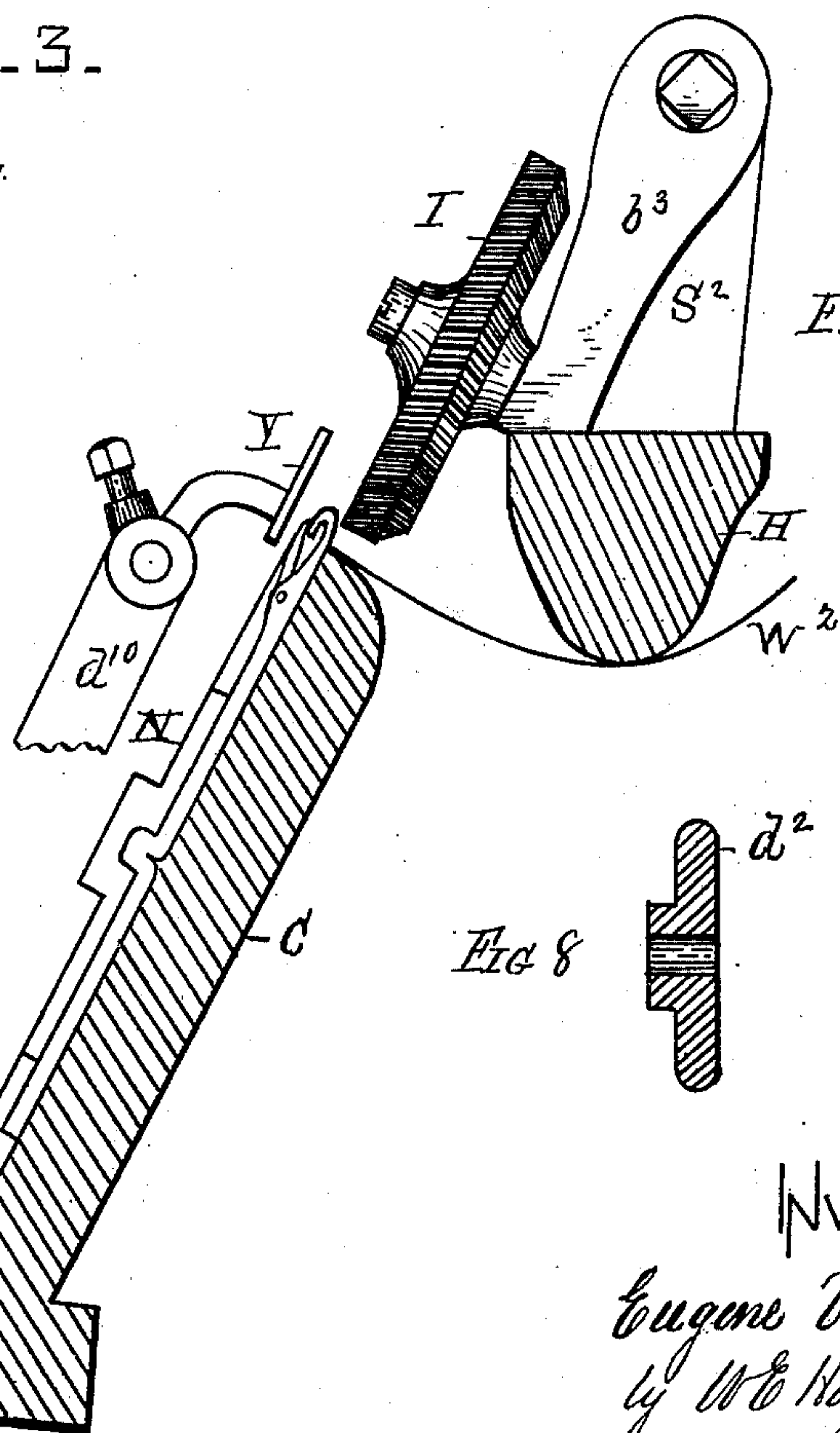


Fig 10

Fig 8

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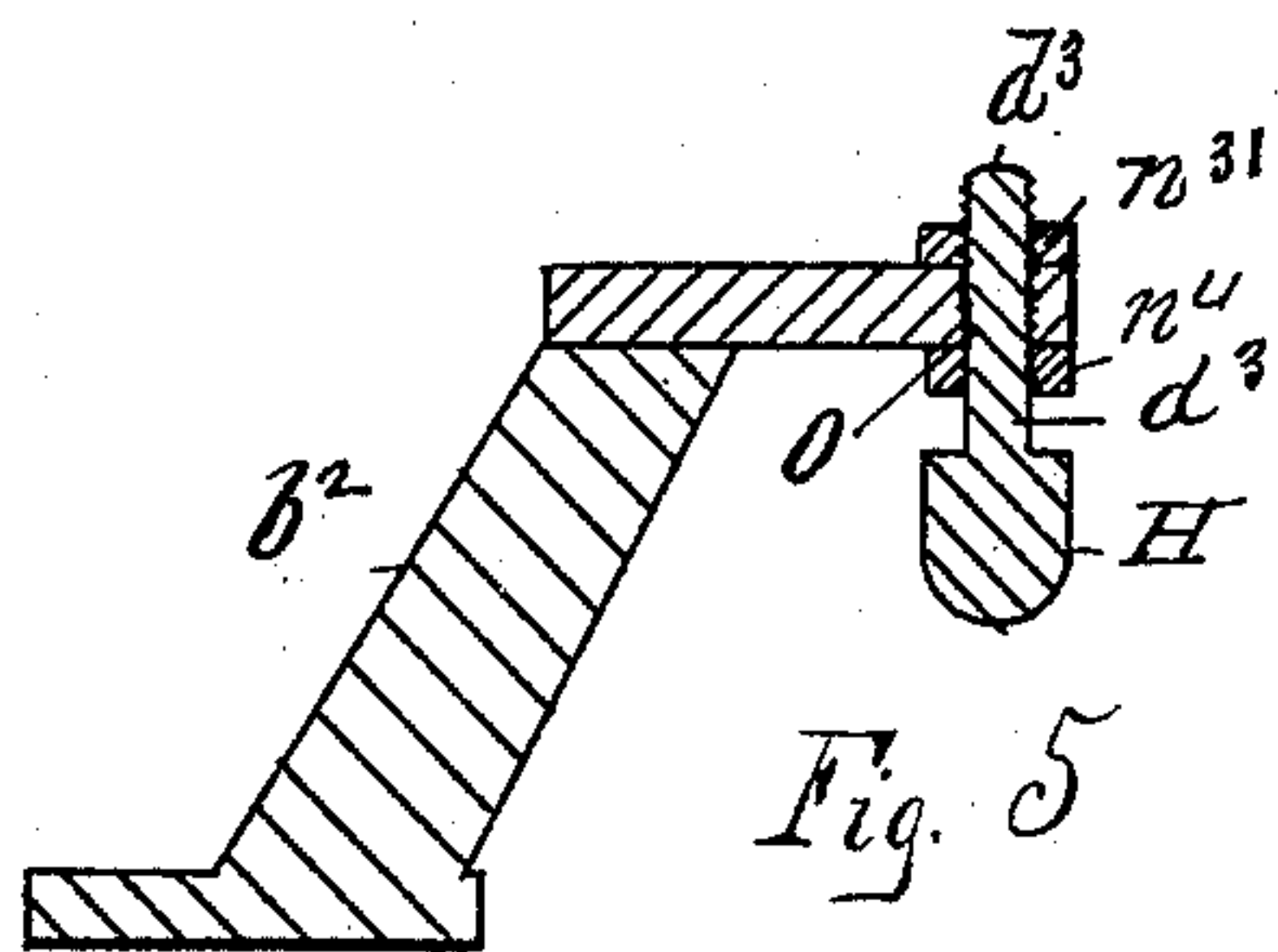
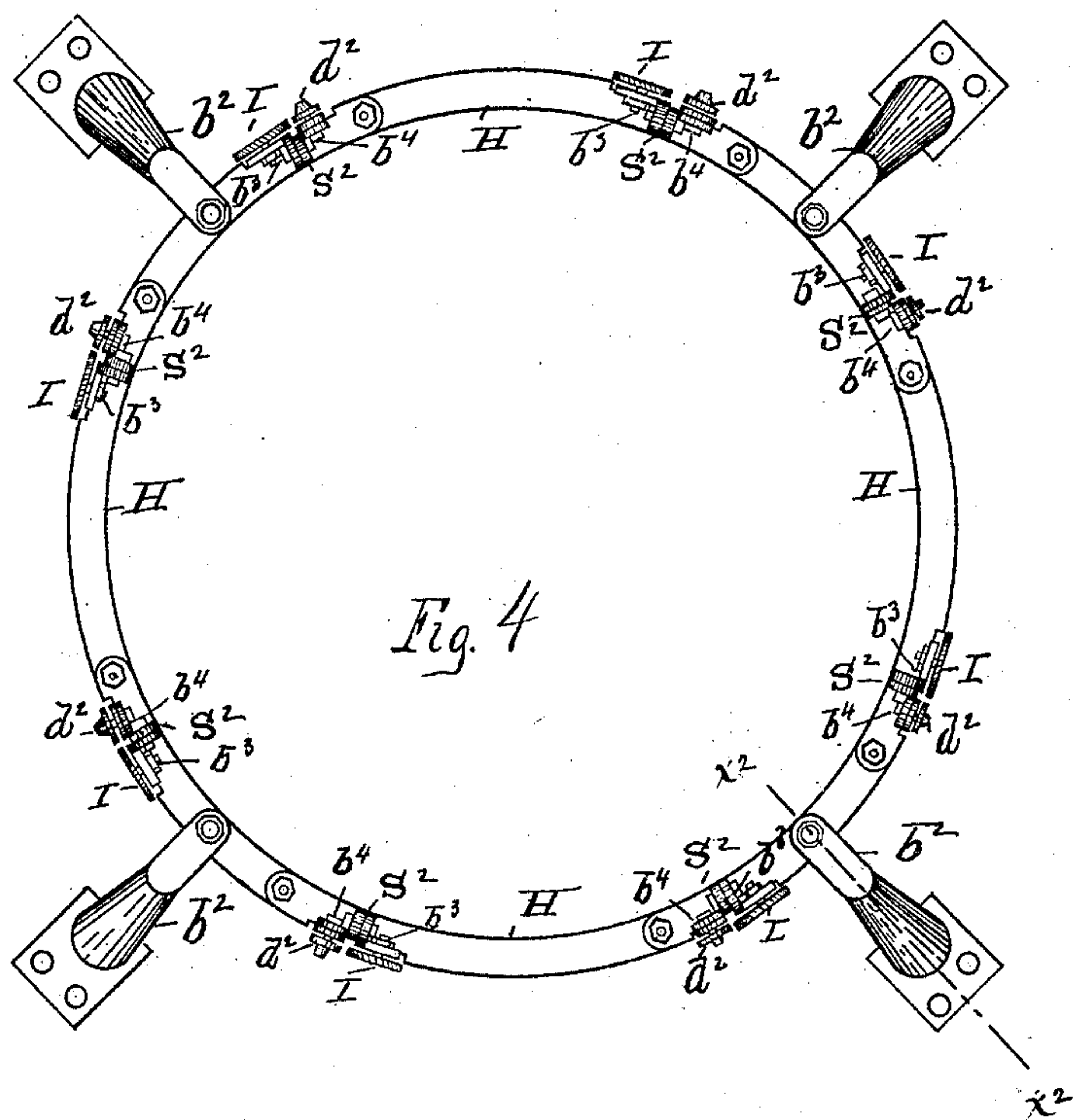
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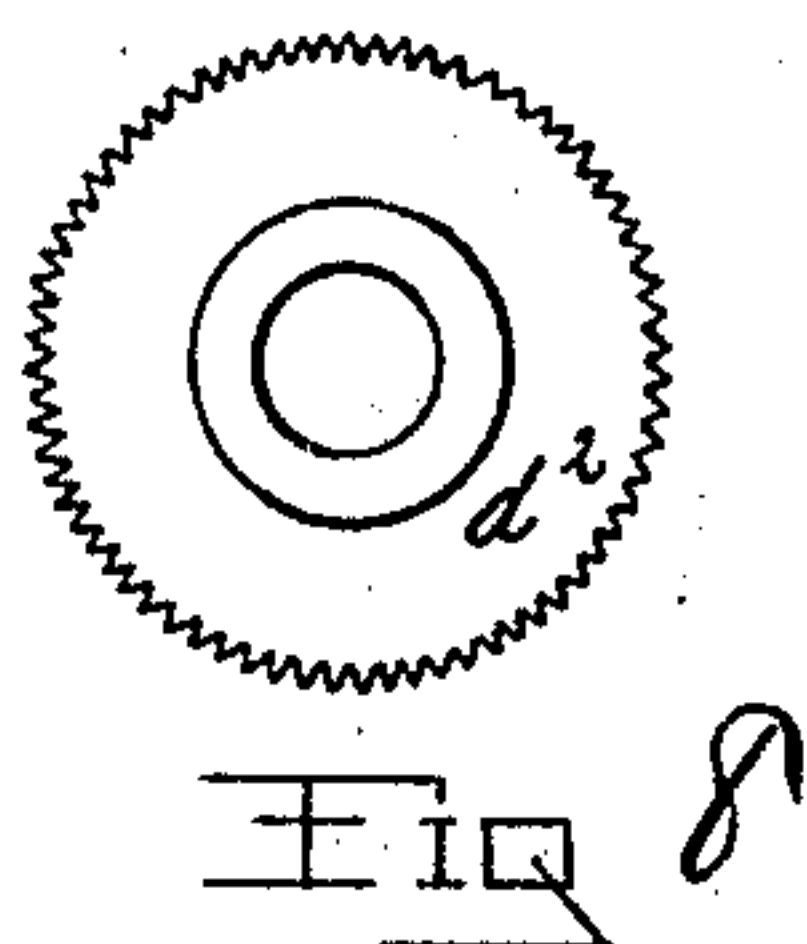
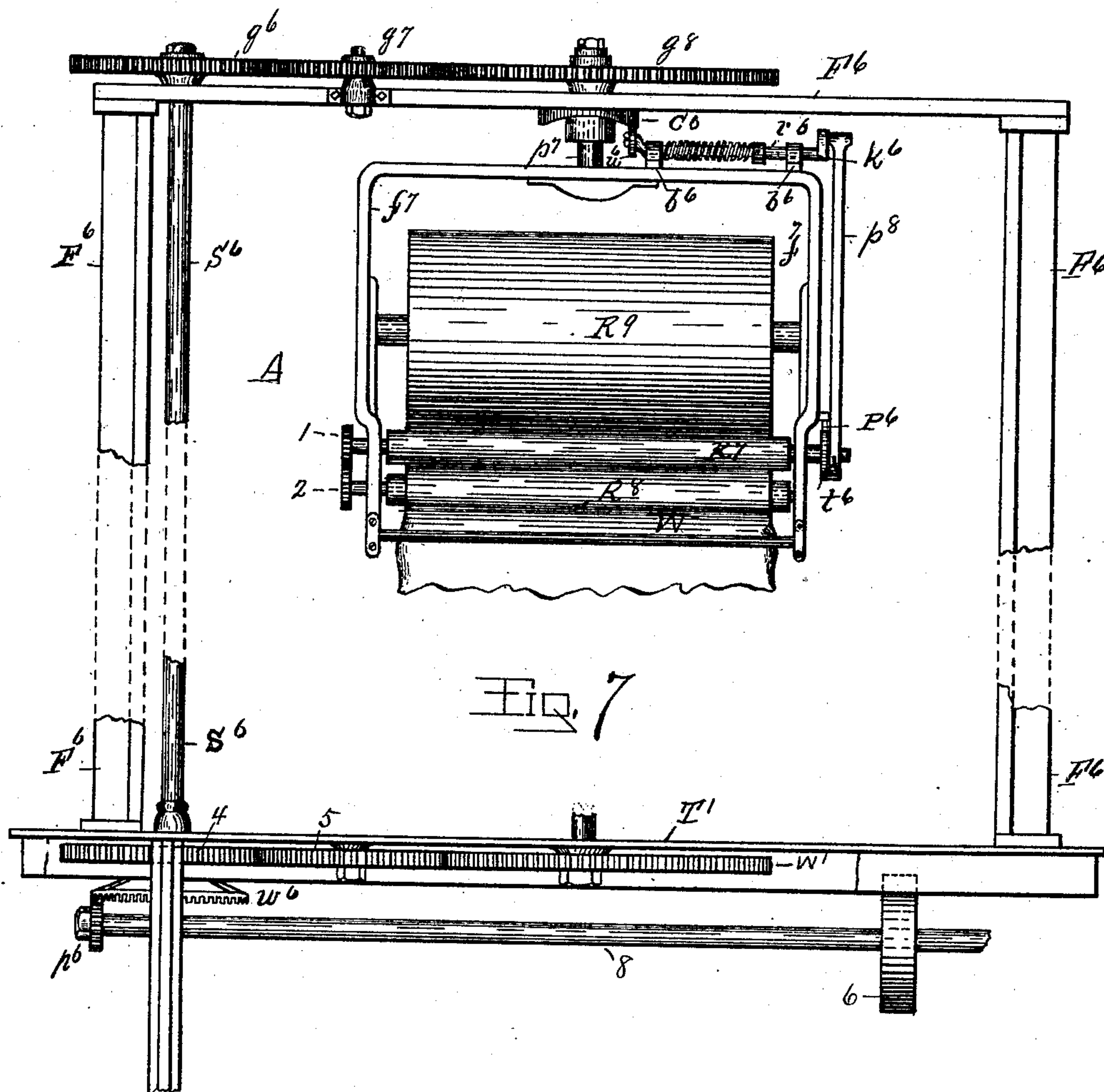
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UNITED STATES PATENT OFFICE.

EUGENE VERMILYEA, OF WATERFORD, NEW YORK, ASSIGNOR TO THE
TABOR KNITTING MILLS, OF SAME PLACE.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 395,764, dated January 8, 1889.

Application filed April 10, 1886. Serial No. 198,425. (No model.)

To all whom it may concern:

Be it known that I, EUGENE VERMILYEA, a citizen of the United States of America, residing at Waterford, in the county of Saratoga and State of New York, have invented new and useful Improvements in Circular-Knitting Machines, of which the following is a specification.

My invention relates to that class of circular-knitting machines which are adapted to use latch-needles that are operated by jacks, and in which machines the web as produced is taken from the needles downwardly through the machine-cylinder, the object and purpose of my invention and improvement being to deliver the web upwardly to the take-up mechanism, so that it will be above the machine as produced and in a better position to be seen.

Accompanying this specification to form a part of it there are five plates of drawings containing ten figures, illustrating my invention, with the same designation of parts by letter-reference used in all of them.

Of these illustrations Figure 1 is a perspective of a circular-knitting machine with my invention applied thereto, said machine being of the kind in which latch-needles are used. Fig. 2 is a vertical section taken on the line $x' x'$ of Fig. 1. Fig. 3 is a cross-section of the friction-rolls of the "take-up" mechanism and the cloth-roll. Fig. 4 is a top view of a deflecting-ring and the brackets by which it is connected with one of the stationary rings of the knitting-machine. This illustration also shows the position of the pressing-wheels that are by means of a stud and brackets connected with said ring. Fig. 5 is a vertical section of one of the ring-brackets and ring where connected with said parts, (shown as taken on the line $x^2 x^2$ of Fig. 4.) Fig. 6 is an enlarged representation of one set of the cams which operate the needle-jacks, showing also the adjacent parts of the upper and lower stationary rings of the knitting-machine on which the cams are placed, and also showing some of the jacks and needles. Fig. 7 is a side elevation of the take-up mechanism and the frame which supports it, with a part of the latter and the vertical shaft which operates

it shown as broken out. Fig. 8 shows a section of one of the small pressing-wheels. Fig. 9 shows an enlarged front view of a part of the needles, one of the large pressing-wheels, and one of the small pressing-wheels, one of the yarn-guides, and the outside of one of the cam-standards. Fig. 10 shows a section taken through the ring under which the fabric passes to move up to the take-up mechanism, an edge view of one of the larger pressing-wheels, and also an edge view of one of the yarn-guides and one of the needles, and a section of part of one of the cylinders.

The several parts of the mechanism thus illustrated are designated by letter-reference, and the function of the parts is described as follows:

The letter C indicates the machine-cylinder, adapted to be rotated by power applied to the wheel W' by any of the well-known means employed to operate knitting-cylinders of the kind shown.

The letter S designates a sleeve, that is centrally and downwardly projected from the cylinder-bottom t to pass through the machine-table T', to rest with its bearing end on the plate p' of the shelf F, the latter being downwardly projected from the under side of this table T'.

The letter d' designates a stud, on which the sleeve S and cylinder C connectedly rotate.

The letter n^3 designates a nut on the sleeve S, arranged to rest with its under face on the table T'. This nut or ring serves as a support to the cylinder and to steady the sleeve S, to which it is secured by a set-screw, substantially as shown.

W' designates a gear-wheel arranged below the table, with the sleeve S projected through and secured in its hub h' . The sleeve S is cast or formed on a cross-piece, 7, arranged across the bottom of the cylinder C. On the shaft S^6 is a gear-wheel, 4, which meshes with a gear-wheel, 5, journaled on a bearing fixed in the table, substantially as shown, and the latter in turn meshes with the wheel S, which rotates the cylinder. Power is applied through the band-pulley 6 on shaft 8 and gears p^6 and w^6 .

The letter N designates the latch-needles,

which are arranged in the outer face of the cylinder C, so as to project upwardly and inwardly on an incline.

The letter R' designates an upper stationary ring that is supported on posts m' . This stationary ring contains cams K', that engage with jacks J' to raise the needles as the cylinder C rotates.

The letter R² designates another stationary ring arranged below the upper ring that is supported on the table T' by the posts m^2 , and which is also provided with cams K², arranged to operate the jacks J², to draw down the needles forced upwardly by the cam K' of the upper stationary ring, R', as the cylinder is rotated.

The letters S² designates studs, that are projected upwardly from the top of the deflecting-ring H. These studs are provided with brackets b^3 and b^4 , oppositely projected from the two sides of the studs.

The letters I designate pressing-wheels, that are provided with offset-bearings in each of the brackets b^3 , and the periphery of each of these wheels is arranged to press down upon the web inside of the needles between the latter and the ring H, to hold down the web when the needles rise.

The letters d^2 designate other and small pressing-wheels, having the same function as the larger pressing-wheels, I, each of which wheels d^2 is provided with an offset bearing in one of the brackets, b^4 , so as to turn thereon. The rim-face of these pressing-wheels I and d^2 are milled to engage with the web while holding it down.

The letter Y designates a yarn-guide, and d^{10} its standard.

The cylinder thus arranged with latch-needles and rings provided with cams to operate jacks to raise and lower the needles together with the pressing-wheels, before described, constitute no part of my invention considered separately and apart from my improved attachment to the machine containing them, and with which they may co-operate.

The letter H designates a ring, the function of which is to downwardly and in sequence upwardly deflect the web coming from the needles. This ring H is attached to the upper stationary ring, R', by the brackets b^2 . These brackets are arranged to project upwardly and to extend inwardly with an overhang above—that is, vertically inside of the needles—and each of these brackets is provided with an opening, O, at its upper and inner ends for the upward passage through it of one of the series of studs d^3 , arranged on the upper surface of the ring H. These studs are threaded at their upper ends for the reception of nuts n^3 n^4 to make the studs and the ring H, which they connect vertically adjustable relatively to the position of the lower surface of said ring where inside of and below the upper ends of the needles. The ring H thus placed and held, the web W² coming from the needles is carried down from the

latter in the usual manner, as in this kind of circular-knitting machines, and is then, by my improvement, made to pass under said ring H, and thence upwardly to the take-up mechanism at A. This take-up mechanism (shown at Fig. 7) is constructed as follows:

The letter F⁶ designates a stationary frame, S⁶ a vertical shaft, receiving power from a beveled gear-wheel, w^6 , on its lower end, and which meshes into a beveled pinion, p^6 , on the shaft which drives the knitting-machine cylinder.

The letter g^6 designates a gear-wheel on the upper end of the said shaft S⁶, the latter gear-wheel meshing into another gear-wheel, g^7 , and the latter into a gear-wheel, g^8 , on the vertical shaft, which moves the take-up frame proper, and this geared connection, by which it is operated, is arranged to give it the same speed as the machine-cylinder. The pintle p^7 , with which the gear-wheel g^8 turns, passes down through so as to turn in a stationary cam-plate, C⁶, that is pendent from the other side of the frame F⁶.

The letter r^6 designates a rod or shaft, having bearings b^6 in the top of the frame f^7 of the take-up mechanism, and one end of this rod has a cam-roller, u^6 , which serves to turn the rod in connection with the cam C⁶, and the other end of this rod is provided with a crank, k^6 , which operates a pitman, p^8 , and a pawl, P⁶, to turn a ratchet, t^6 , on the friction-roller R⁷, which is provided with a gear, 1, meshing with a gear, 2, on the other friction-roller, R⁸. The cloth-roll R⁹ is made to have its journaled ends turn in the usual vertical slots made on each of the inner and opposite sides of the frame f^4 , so that as the web is rolled thereon and its diameter increases the journal ends of the roller R⁹ will rise in said slotted bearings with the fabric or web on the lower side thereof resting upon the sanded surface of the roller R⁷. The web in passing between and over the rollers R⁸ and R⁷, the surfaces of which are sanded, is caused to make a strong frictional engagement therewith, by which it is moved upwardly, and by the frictional engagement between the web and the rollers R⁹, and the rolled-up web and said roller actuated to turn.

The take-up mechanism thus shown is of the usual and ordinary kind, and any other well-known form of take-up mechanism may be used that will roll up the web in like manner.

When the web passes down through the cylinder, as is the usual method in operating circular-knitting machines having latch-needles, the web is not so easily examined when produced as it is when caused to pass upwardly to the take-up mechanism by the use of my improvement.

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

1. The combination, with the cylinder of a circular-knitting machine containing latch-

needles and adapted to be rotated, and an exterior stationary ring provided with cams to operate the needle-jacks, of an interior deflecting-ring arranged inside of and immediately below the upper ends of the needles, and overhanging brackets connecting the deflecting-ring with the said exterior stationary ring, as shown and described.

2. The combination of the cylinder C, adapted to be rotated and provided with latch-needles, the exterior stationary rings, R' and R², provided with cams to operate the needle-jacks, the deflecting-ring H, secured to overhanging brackets b², and arranged inside of and immediately below the upper ends of the needles, said ring H being provided with pressing-wheels I and d², and a take-up mechanism, A, substantially in the manner as and for the purpose set forth.

3. The combination, with the cylinder C, provided with latch-needles and adapted to be rotated, of the stationary ring R', provided with brackets b², and the stationary deflecting-ring H, secured to the overhanging ends of the brackets b², and arranged below and inside the upper ends of the needles, substantially as and for the purpose set forth.

4. The combination, with the cylinder C, provided with the latch-needles and adapted to be rotated, of the stationary ring R', provided with brackets b², the stationary deflecting-ring H, secured to the brackets b², and arranged below and inside of the upper ends of the needles, substantially as shown, and the pressing-wheels I and d², arranged on said ring H, substantially as and for the purpose set forth.

5. The combination, with the cylinder, the table, and the cam-ring of a circular-knitting machine, of brackets secured to the cam-ring and overhanging the upper edge of the cylinder, and a deflecting-ring, H, secured to the overhanging ends of said brackets, with its lower edge below the top edge of the cylinder, substantially as described.

6. The combination, with the cylinder, the needles, and the table of a circular-knitting machine, of the stationary cam-ring R², supported on posts on the machine-table, the stationary cam-ring R', supported on posts on the ring R², the brackets b², having their upper ends projected over the upper edge of the cylinder, and the ring H, secured to the end of the brackets, with its lower edge below the inner top edge of the cylinder, substantially as described.

7. The combination, with the cylinder C, the needles, and cam-rings of a circular-knitting machine, of brackets mounted on the upper cam-ring, a fabric-deflecting ring secured on the upper end of said brackets, arranged as described, and presser-wheels mounted on the fabric-deflecting ring, substantially as described.

Signed at Troy, New York, this 23d day of February, 1886, and in the presence of the two witnesses whose names are hereto written.

EUGENE VERMILYEA.

Witnesses:

CHARLES S. BRINTNALL,
GEO. A. DARBY.