I. B. RITTER.

MACHINE FOR ROLLING METAL RINGS.

APPLICATION FILED JUNE 29, 1907.

899,436. Patented Sept. 22, 1908.

2 SHEETS—SHEET 1.

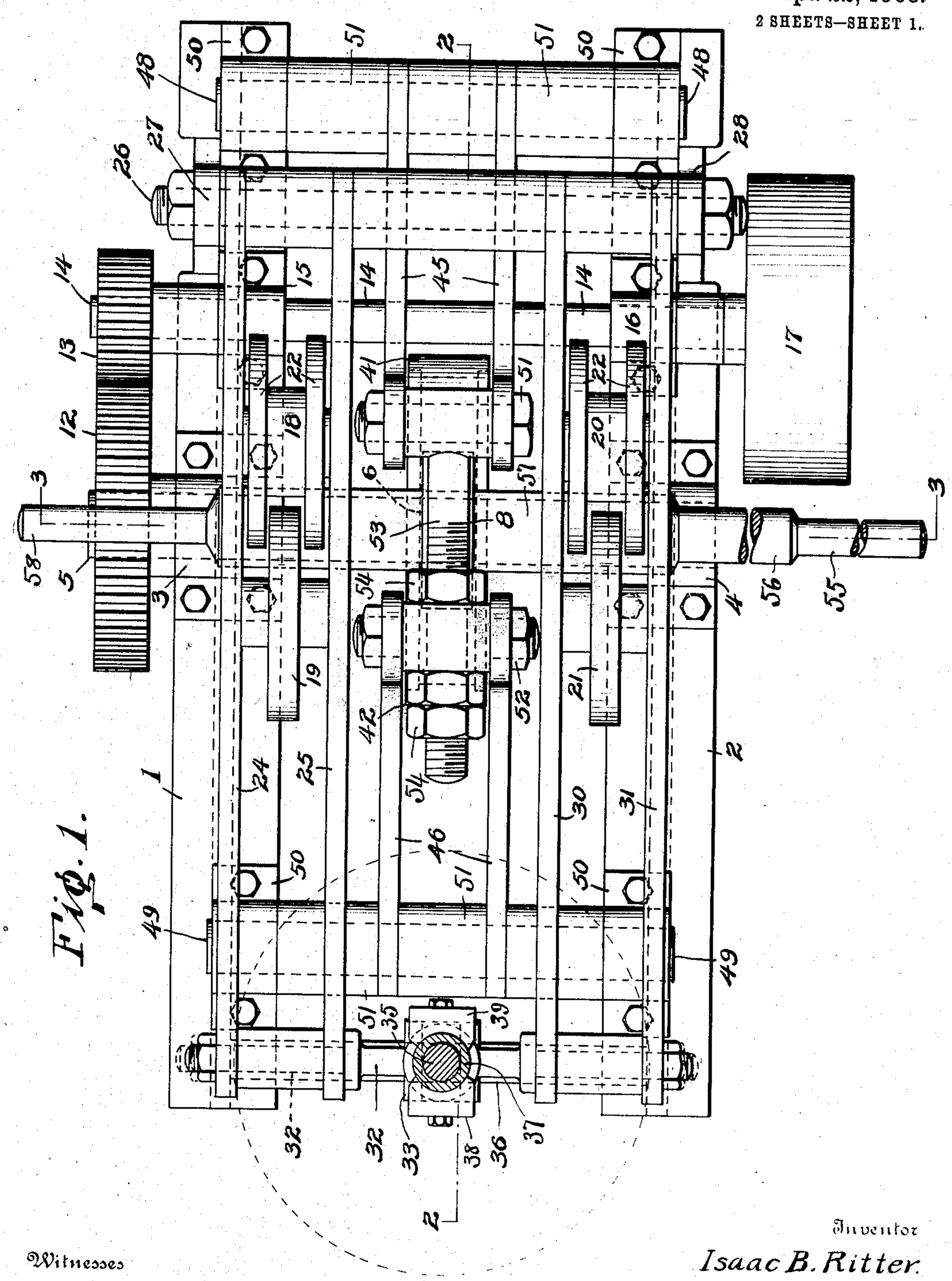


Fig. 1.

Witnesses

Daniel Webster, Jr.

W. R. Edwards

Inventor

Isaac B. Ritter.

By

H. DeWitt Goodwin.

Attorney

I. B. RITTER.

MACHINE FOR ROLLING METAL RINGS.

APPLICATION FILED JUNE 29, 1907.

899,436.

Patented Sept. 22, 1908.

2 SHEETS—SHEET 2.

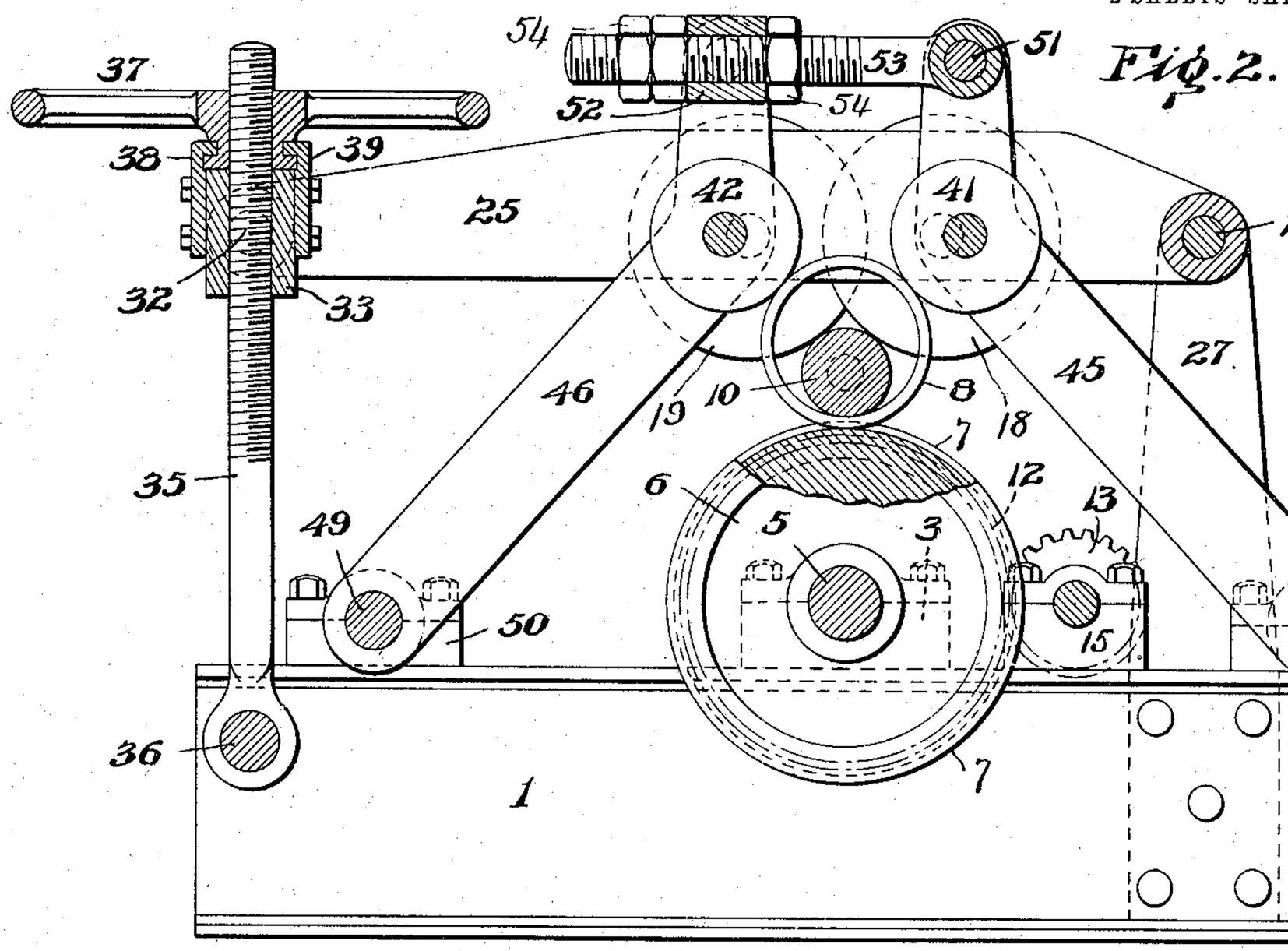


Fig. 2.

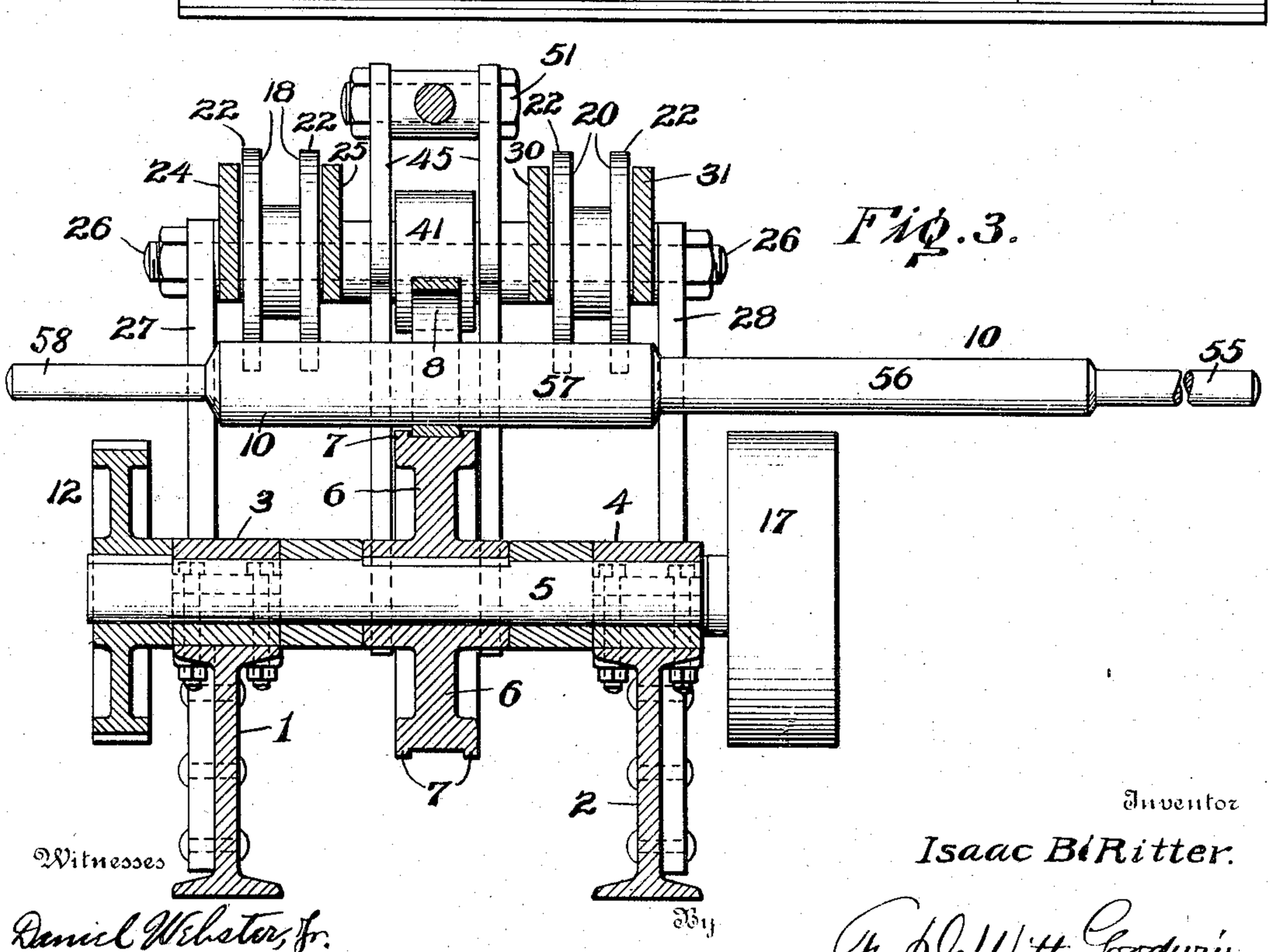


Fig. 3.

Witnesses

Daniel Webster, Jr.

M. R. Doleland

Inventor

Isaac B. Ritter.

By F. DeWitt Goodwin

Attorney

UNITED STATES PATENT OFFICE.

ISAAC B. RITTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO EDGAR ASHMAN, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR ROLLING METAL RINGS.

No. 899,436. Specification of Letters Patent. Patented Sept. 22, 1908.

Application filed June 29, 1907. Serial No. 381,453.

To all whom it may concern:

Be it known that I, ISAAC B. RITTER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Rolling Metal Rings, of which the following is a specification.

My invention relates to improvements in a machine for rolling metal rings and the object of my invention is to construct a machine by which a ring may be rolled to any desired dimensions; a further object of my invention is to construct a machine which will form a ring from a solid piece of metal without having a weld or joint in the ring. Rings of this construction are used in the manufacture of cylinders for knitting machinery, ball-bearings and the like.

Referring to the drawings: Figure 1. is a plan view of my improved machine for making rings; Fig. 2. is a vertical section on line 2—2 Fig. 1; and, Fig. 3. is a vertical section on line 3—3 Fig. 1.

In the drawings 1 and 2 are "I-beams" forming the base or frame of the machine; 3 and 4 are bearings in which is mounted a shaft 5 having keyed thereon a wheel 6 upon which the ring 8 is formed by the pressure of the mandrel 10. The mandrel 10 is made in three sections 55, 56 and 57, each section being of larger diameter than the other. The smallest diameter is used when the ring 8 is first placed upon the mandrel. As the size of the hole in the ring increases a larger section of the mandrel is used for rolling the ring. It is desirable to use a mandrel of as large a diameter as possible so that the same will not slip, which would cause flat places to be formed in the ring. The mandrel is provided with a reduced end section 58 which is used as a handle when the mandrel is being placed in the machine. The said shaft 5 carrying the wheel 6 is rotated by a gear-wheel 12 on said shaft. Said gear-wheel 12 meshes with a pinion 13 on the driving-shaft 14 which is mounted in bearings 15 and 16 on the "I-beams" 1 and 2. A belt pulley 17 is provided as a means for rotating the driving-shaft 14.

Pressure is brought to bear upon the mandrel by two pairs of pressure rollers. One pair of pressure rollers 18 and 19 is located at one side of the wheel 6 and the other pair of pressure rollers 20 and 21 is located at the opposite side of the wheel 6, so that the mandrel will be held in a horizontal position.

Each pair of pressure rollers consists of a double flanged roller and a single flanged roller, which latter fits between the flanges 22 of the double flanged roller. By making the rollers in this way greater pressure can be exerted upon the mandrel as the centers of the rollers can be brought closer together.

The pressure rollers 18 and 19 are mounted between lever members 24 and 25 pivoted on a shaft 26 mounted in bearings 27 and 28 secured upon the "I-beams" 1 and 2. The pressure rollers 20 and 21 are similarly mounted between lever members 30 and 31 also pivoted to the said shaft 26. The opposite ends of the said beams 24, 25, 30 and 31 are rigidly held together by a shaft 32 having an enlarged central portion 33 with an aperture formed through the same to receive a bolt 35. Said bolt 35 is pivoted to the cross rod 36 secured in the "I-beams" 1 and 2. The said bolt 35 is screw-threaded, as is also the central aperture formed in the hand-wheel 37. The enlarged central portion of the shaft is connected with the hand-wheel by plates 38 and 39 to permit the said hand-wheel 37 to rotate. By turning the hand-wheel 37, the shaft 32 carrying the ends of the lever members 24, 25, 30 and 31 can be adjusted to any position, and in this way any desired pressure can be brought to bear upon the mandrel through the said pressure rollers.

Gage rollers 41 and 42 are provided to regulate the diameter to which the ring 8 is to be rolled. When the ring is of sufficient diameter to contact with the said gage rollers 41 and 42 the metal forming the ring 8 will be rolled thinner by the action of the mandrel and the width of the ring will increase. The said gage rollers 41 and 42 are hung in the center of the machine in vertical alinement with the wheel 6 as shown in Fig. 3. Bearings 45 and 46 are provided in which said gage rollers are rotatably mounted. The said bearings each consist of two plates pivoted at their lower ends to shafts 48 and 49 mounted in bearings 50 on the "I-beams" 1 and 2. Sleeves 51 are provided on said shaft 48 and 49 to hold the bearings 45 and 46 in their proper positions. The upper ends of said plates forming the bearings 45 and 46 are secured together by bolts 51 and 52 between which extends a rod 53 pivoted at one end to the bolt 51 in the bearings 45 and adjust-

ably secured in the enlarged portion of the bolt 52 in the bearing 46. By adjusting the nuts 54 on the rod 53, the position of the gage rollers 41 and 42 may be varied according to the size of the ring that is desired to be rolled.

The ring 8 is formed from a metal disk having a hole punched in the center of the same, through which hole is inserted the mandrel 10. The pressure rollers 18, 19, 20 and 21 are then brought down upon the mandrel by means of the hand-wheel 37, so that the ring 8 will be impinged between the mandrel and the wheel 6. The flanges 7 upon said wheel 6 are provided to prevent the ring from slipping off the wheel and not to regulate the width of the ring.

When the wheel 6 is rotated the ring 8 will be rolled between the mandrel and the said wheel 8, until the ring has reached the desired diameter as regulated by the position of the gage rollers 41 and 42.

If the rolling of the ring is continued after the ring contacts with the gage rollers 41 and 42, the thickness of the metal forming the ring will become thinner and the width of the ring will increase.

Having thus described my invention I claim and desire to secure by Letters Patent:—

1. In a machine for rolling rings, the combination of a frame, a wheel mounted thereon, a mandrel, pressure rollers located at opposite sides of said wheel and adapted to press upon the mandrel, said pressure rollers revolubly mounted in lever members, which said lever members are pivotally mounted on the frame, and each of which has a free end, a shaft member connecting the free ends and means between the shaft member and the frame adapted to force said pressure rollers toward the said wheel.

2. In a machine for rolling rings, the combination of a frame, a wheel mounted thereon, a mandrel, pressure rollers located at opposite sides of said wheel and adapted to press upon the mandrel, said pressure rollers arranged in pairs consisting of a single flanged roller and a double flanged roller, said pairs of pressures rollers mounted in lever members pivotally mounted on the said frame, and means for engaging the free ends of said lever members to force said pressure rollers towards the said wheel.

3. In a machine for rolling rings, the combination of a frame, a wheel mounted thereon, a mandrel, pressure rollers located at opposite sides of said wheel and adapted to press upon the mandrel, lever members in which said pressure rollers are revolubly mounted, said lever members being pivotally mounted in said frame, means for regulating the pressure of said pressure rollers against said mandrel, gage rollers, bearings in which said gage rollers are revolubly mounted, said bearings being pivotally mounted in the said frame, and means for adjusting the free ends of said bearings to regulate the position of said gage rollers in relation to said wheel.

4. In a machine for rolling rings, the combination of a frame, a wheel mounted thereon, a mandrel, pressure rollers located at opposite sides of said wheel and adapted to press upon the mandrel, lever members in which said pressure rollers are revolubly mounted, said lever members being pivotally mounted in said frame, means for regulating the pressure of said pressure rollers against said mandrel, gage rollers, bearings in which said gage rollers are revolubly mounted, said bearings being pivotally mounted in the said frame, a rod pivoted in the free end of one of said bearings, said rod adjustably mounted in the free end of the other one of said bearings whereby the position of said gage rollers may be regulated in relation to the said wheel.

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

ISAAC B. RITTER.

Witnesses:
JAMES F. BOYLAN,
M. R. CLEELAND.