

(No Model.)

R. MANNESMANN.

PROCESS OF ROLLING DAMASKEENED RODS.

No. 365,482.

Patented June 28, 1887.

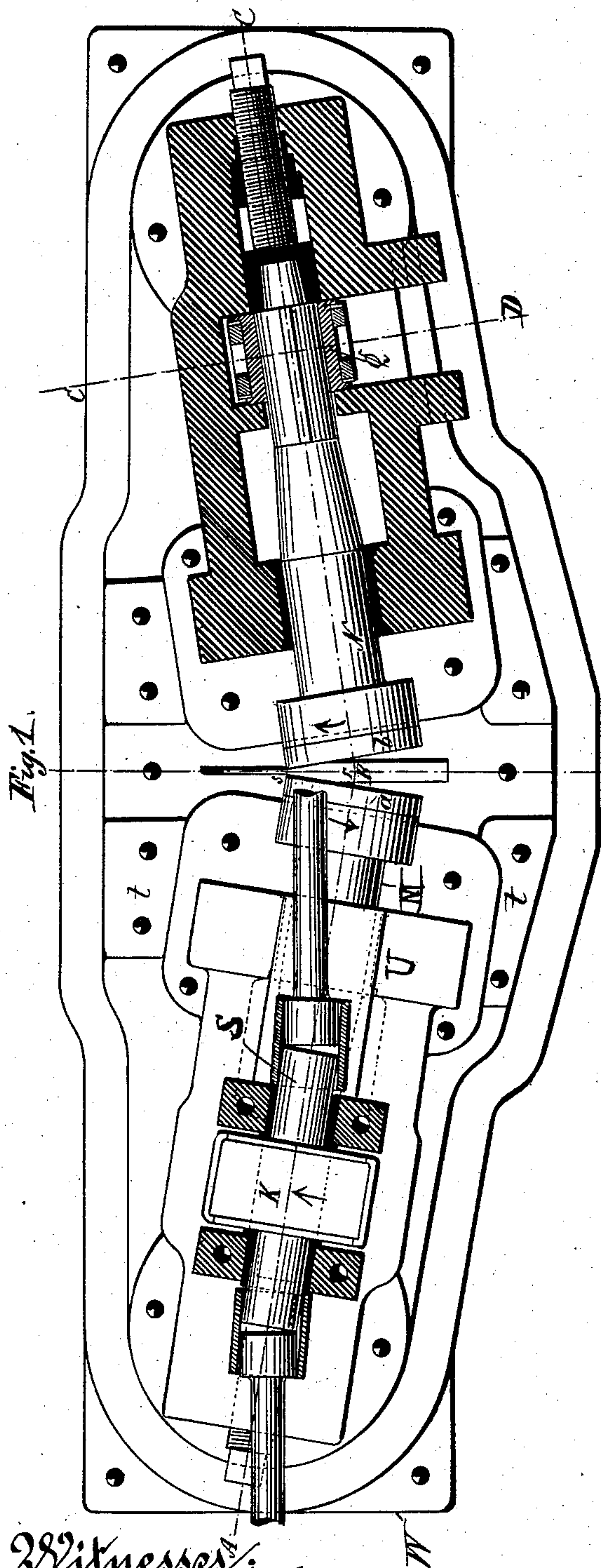


Fig. 1.

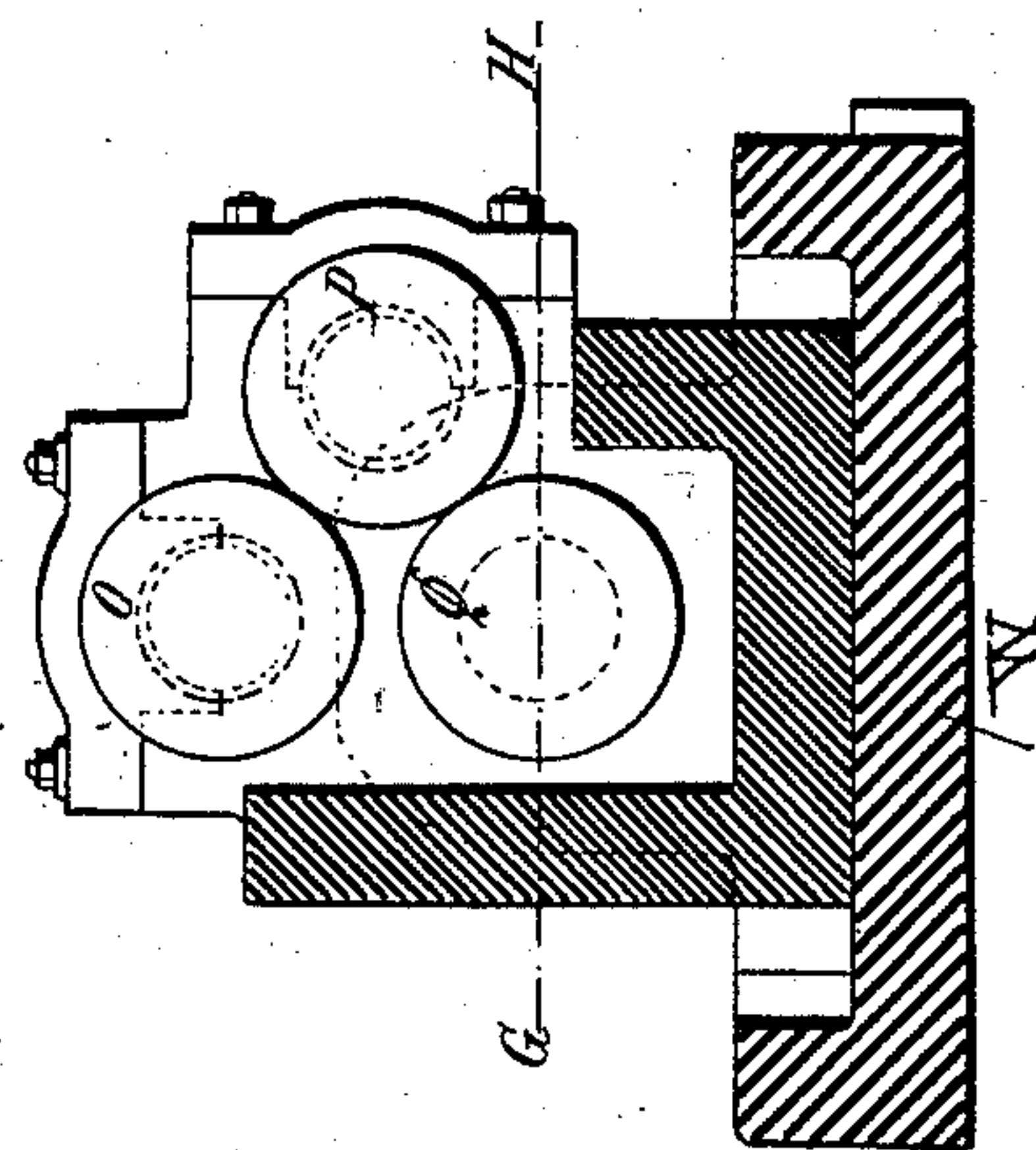


Fig. 3.

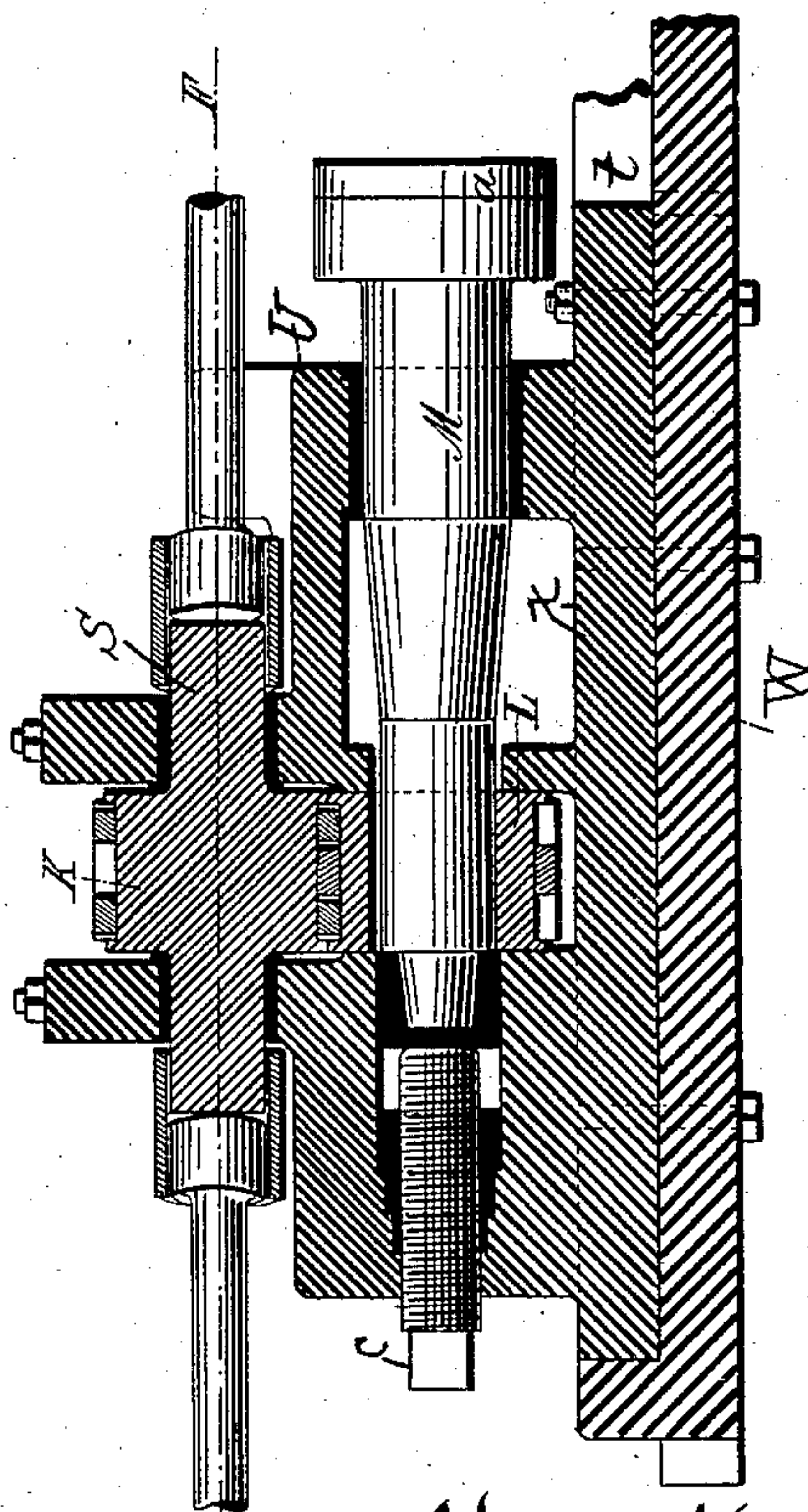


Fig. 2.

Witnesses:
Carl Kay
Martin Petry,

Inventor
Reinhard Mannesmann
by Paul Goepp.
Attorney.

UNITED STATES PATENT OFFICE.

REINHARD MANNESMANN, OF REMSCHEID, PRUSSIA, GERMANY.

PROCESS OF ROLLING DAMASKEENED RODS.

SPECIFICATION forming part of Letters Patent No. 365,482, dated June 28, 1887.

Application filed January 31, 1885. Serial No. 154,589. (No model.) Patented in Germany January 27, 1885, No. 34,617, and in England January 27, 1885, No. 1,167.

To all whom it may concern:

Be it known that I, REINHARD MANNESMANN, of Remscheid, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in the Process of Rolling Damaskeened Rods, (for which Letters Patent have been issued in Germany No. 34,617, dated January 27, 1885, and in England No. 1,167, dated January 27, 1885,) of which the following is a specification.

This invention relates to an improved process of rolling billets or blocks of metals of different qualities or kinds, such as combinations of hard and soft steel with copper, silver, or other combinations of metals into twisted rods or bars, so that the effect of damaskeening is produced.

The invention consists, first, of a process of rolling metal by passing a billet or block formed of a combination of metals differing in quality or kind through between converging rolls rotating in opposite direction to each other, whereby a reduction in the size of the billet is produced and a solid damaskeened rod of spirally-twisted fibers obtained.

It consists, secondly, in uniting several rods rolled as described and passing them again through the rolls, whereby a rope-like inter-twisting of the fibers is obtained.

In the accompanying drawings, Figure 1 represents a plan of one form of the rolling-mill by which my improved process may be carried out, the left-hand side of the same being shown in horizontal section on line E F, Fig. 2, and the right-hand side in horizontal section on line G H, Fig. 3. Fig. 2 is a vertical longitudinal section of one-half of the rolling-mill on line A B, Fig. 1; and Fig. 3 is a vertical transverse section on line C D, Fig. 1.

Similar letters of reference indicate corresponding parts.

In the drawings, *a* and *b* represent two rolls that are arranged obliquely to each other at the ends of the shafts M N, which shafts are supported in suitable bearings of standards U, said standards being arranged between adjusting-pieces *t* and screwed to a bed-plate, W. By adjusting the pieces *t* the inclination of the two shafts M N toward each other may be varied. The shafts are arranged at an angle of

inclination to each other and located in different planes, so that their axes do not intersect with each other. The outer ends of the standards of each shaft are adapted to be swung by bottom disks on the bed-plate, so that the angle formed by the shafts may be changed and the rolls adjusted by set-screws *c*, so that their faces are closer to or farther from each other. One shaft is supported somewhat higher than the other, which is preferably obtained by interposing plates *x* between the bed-plate and the standards of the shafts. The shafts M N are rotated at high speed by a coupled driving-shaft, S, located above the shafts M N, the shafts receiving motion in opposite direction to each other, as indicated by the arrows in Fig. 1, by two gear-wheels, K L, imparting motion to the shaft M, and by three gear-wheels, O P Q, imparting motion to the shaft N. The billet to be rolled is introduced at *r* and withdrawn at *s*. The rolls *a b* impart by their opposite direction of movement an equal speed and a rapid rotation of the billet. Besides the rotary motion, the friction of the rolls imparts to the billet a forward motion, so that it advances according to the speed at which the rolls are rotated. The billet is drawn forward with equal force at all points, while its speed of rotation increases gradually toward the eduction-point, so that its diameter is thereby decreased and at the same time a gradually-increasing spiral twist imparted to the fibers of the metal. When the billet or block is formed of metals differing either in quality—such as hard and soft steel—or differing in kind and color—such as steel, copper, silver, or a combination of any of these metals with each other or with other metals—a beautiful damaskeening effect is imparted to the spirally-twisted fibers of the rods rolled out in this manner. The adjustment of the rolls and their shafts toward each other may be effected while the machine is at rest by means of the adjusting-pieces *t* and interposed bottom plates, *x*, or during the working of the machine by any other approved means. By the rolling-mill both rough rolling and finishing is combined in one heat by means of the converging rolls, which may be used for rolling out various dimensions by means of a single

passage between the rolls. The spiral twist imparted to the fibers may be made greater or smaller, according as the billet is passed quicker or slower through between the rolls, and whether it is applied nearer to the centers of the disks or their periphery. The spiral twisting of the fibers is especially useful in the manufacture of damaskeened steel and other combinations of different metals, which are to be used for gun-barrels, cutlery, and other applications in the arts.

By welding or otherwise uniting several damaskeened rods together and passing the so-formed blank again through the converging rolls, a compound blank or rod with a rope-like twisting of the fibers is obtained, by which a variegated damaskeening effect is produced, which greatly increases the beauty of the metal and permits it to be furnished at a greatly reduced price, so as to render it generally applicable in the arts.

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

1. The process of forming damaskeened rods, which consists in passing a block or billet formed of metals differing in quality or kind between rolls, and thereby reducing the size of the block simultaneously with imparting a spiral twist to the fibers of the metal, substantially as set forth.

2. The process of forming damaskeened rods, which consists in rolling a block or billet composed of metals differing in quality or kind through between rolls, so as to reduce the size and impart a spiral twist to the fibers, then uniting several of these rods and passing them again through rolls, so as to produce a rope-like intertwisting of the fibers, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

REINHARD MANNESMANN.

Witnesses:

GEORGE KOCH,

AUG. NOLTE.