No. 803,079. PATENTED OCT. 31, 1905.

G. J. THUST.

MACHINE FOR PRODUCING SEAMLESS METALLIC TUBES.

APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 1.

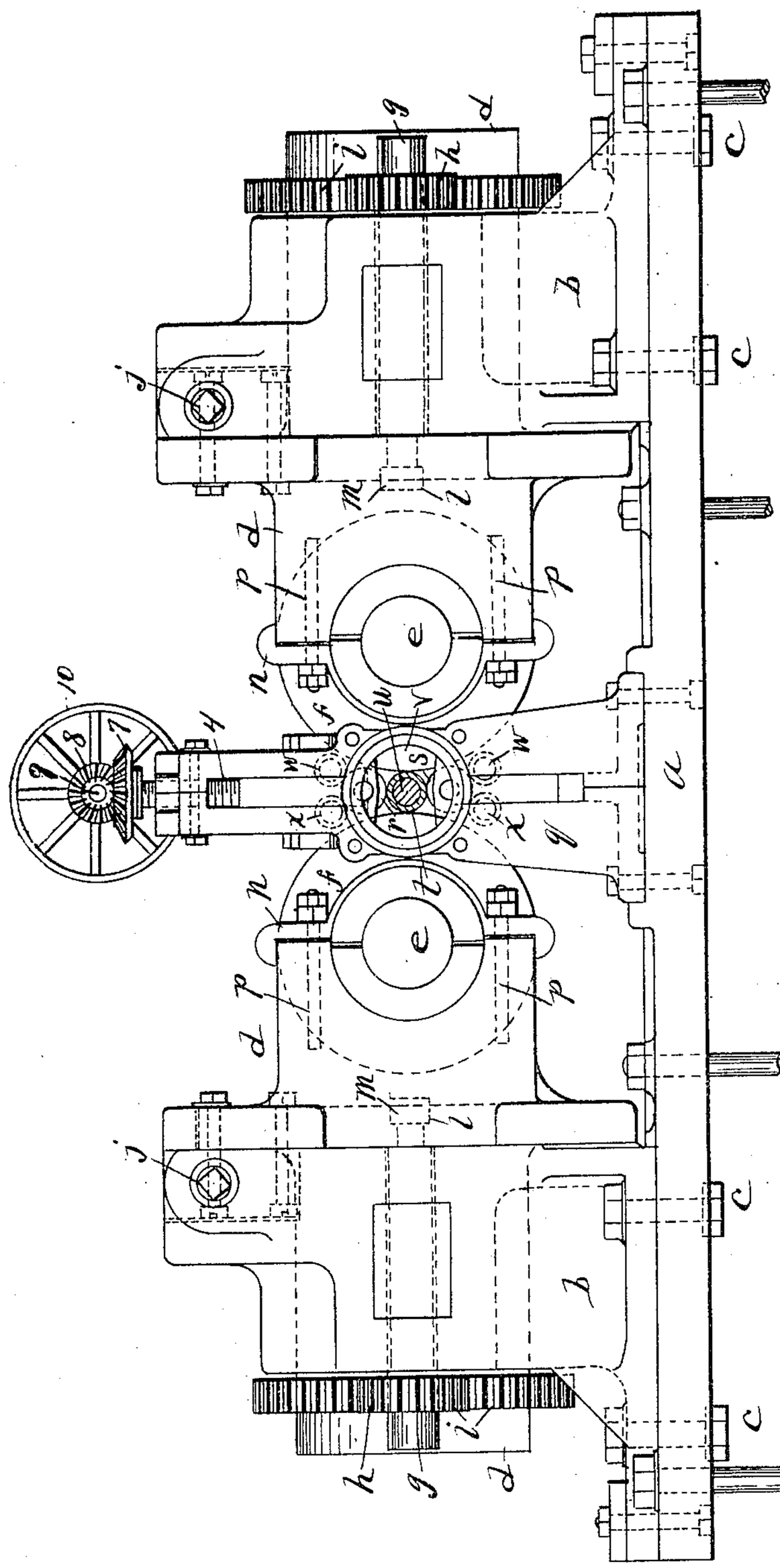

Fig. 1.

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5 SHEETS—SHEET 2.

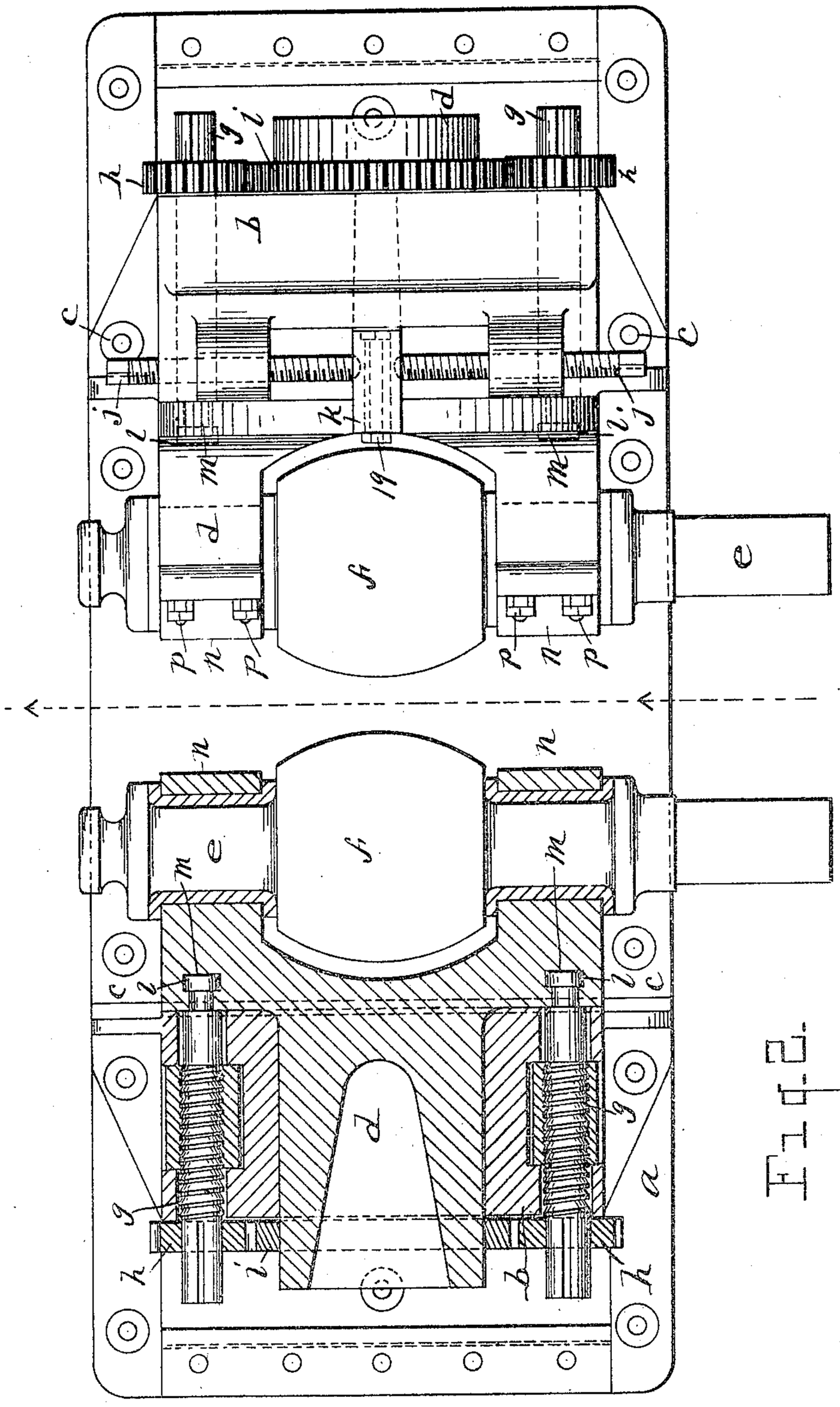

Fig. 2.

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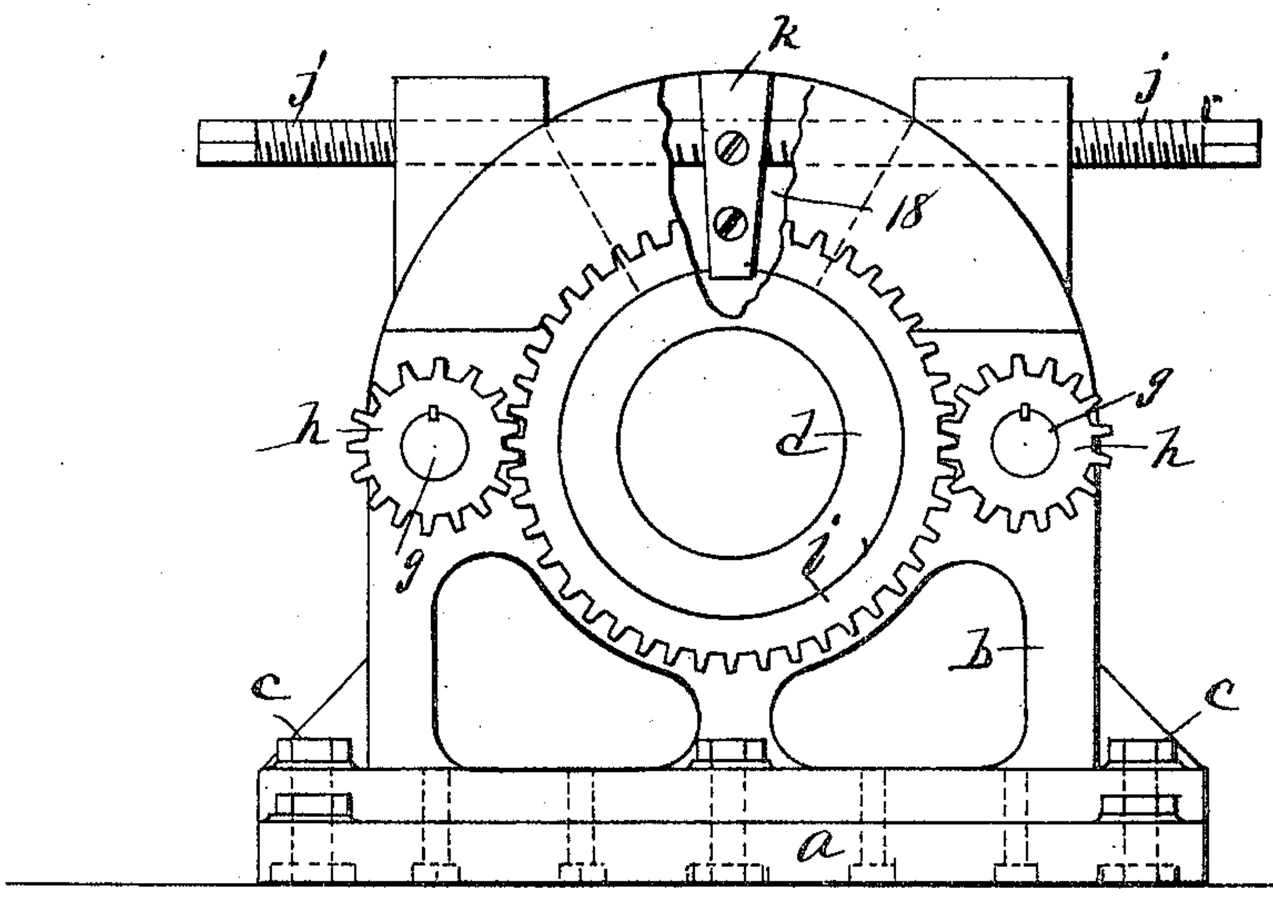

Fig. 3.

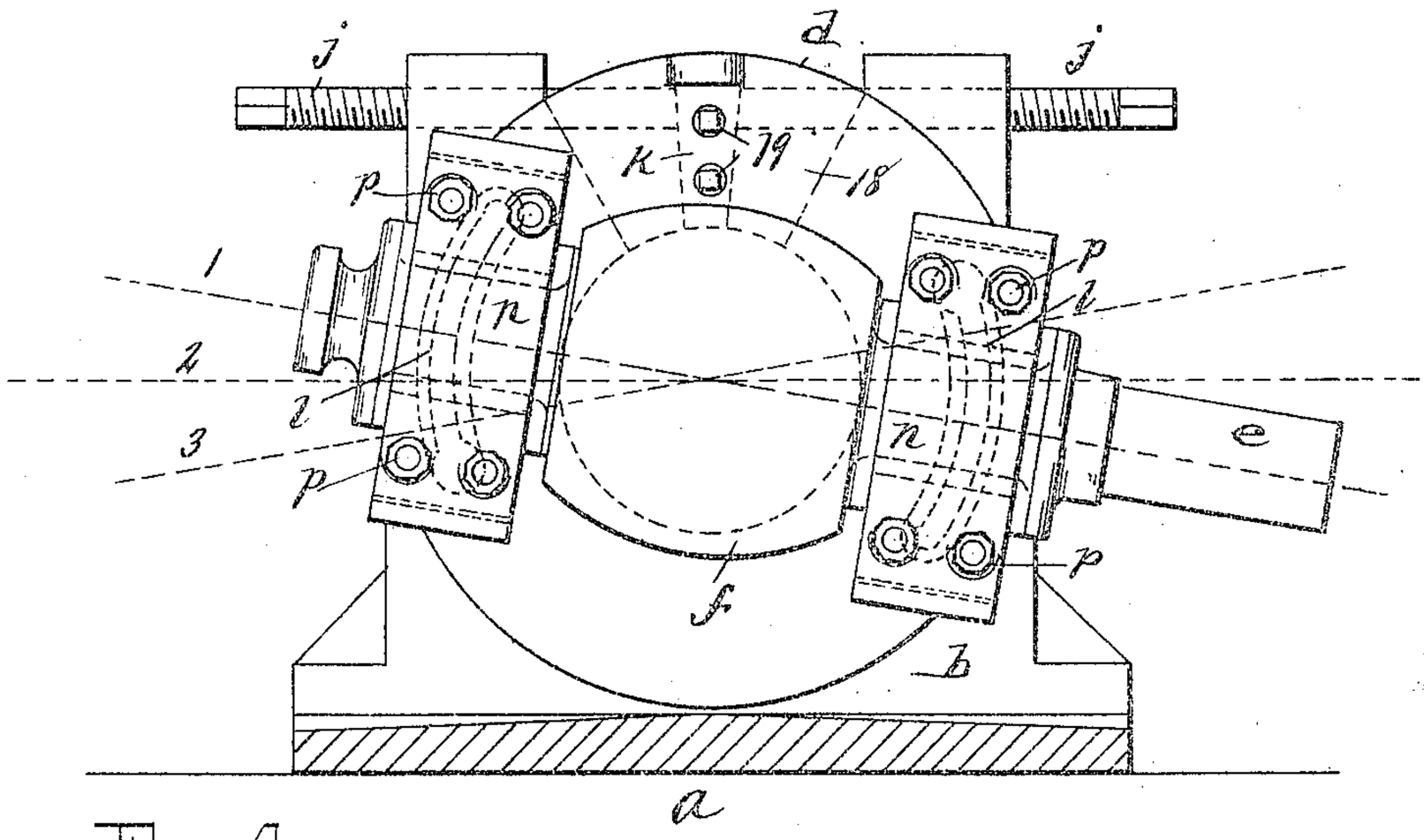

Fig. 4.

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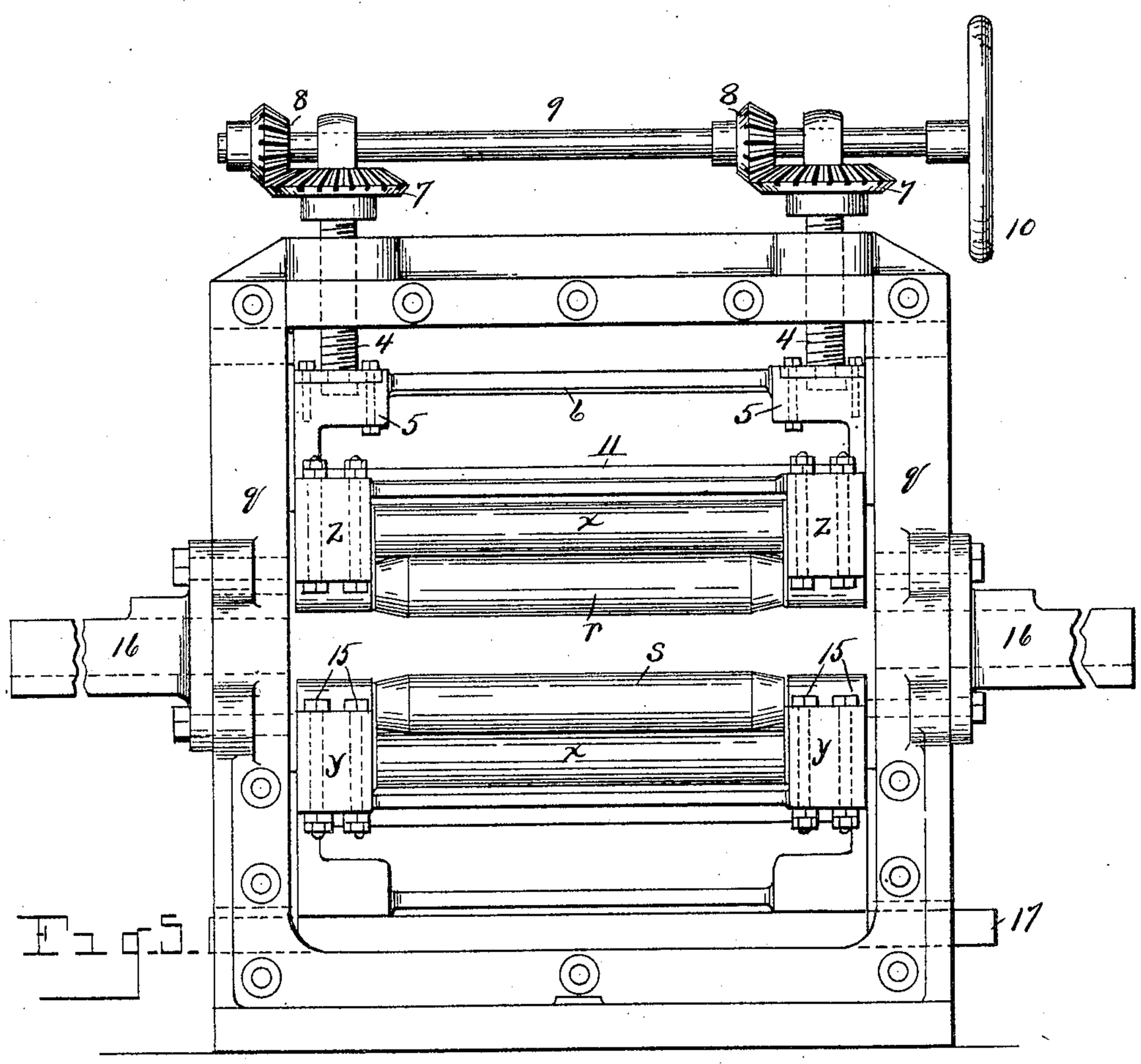

Fig. 5.

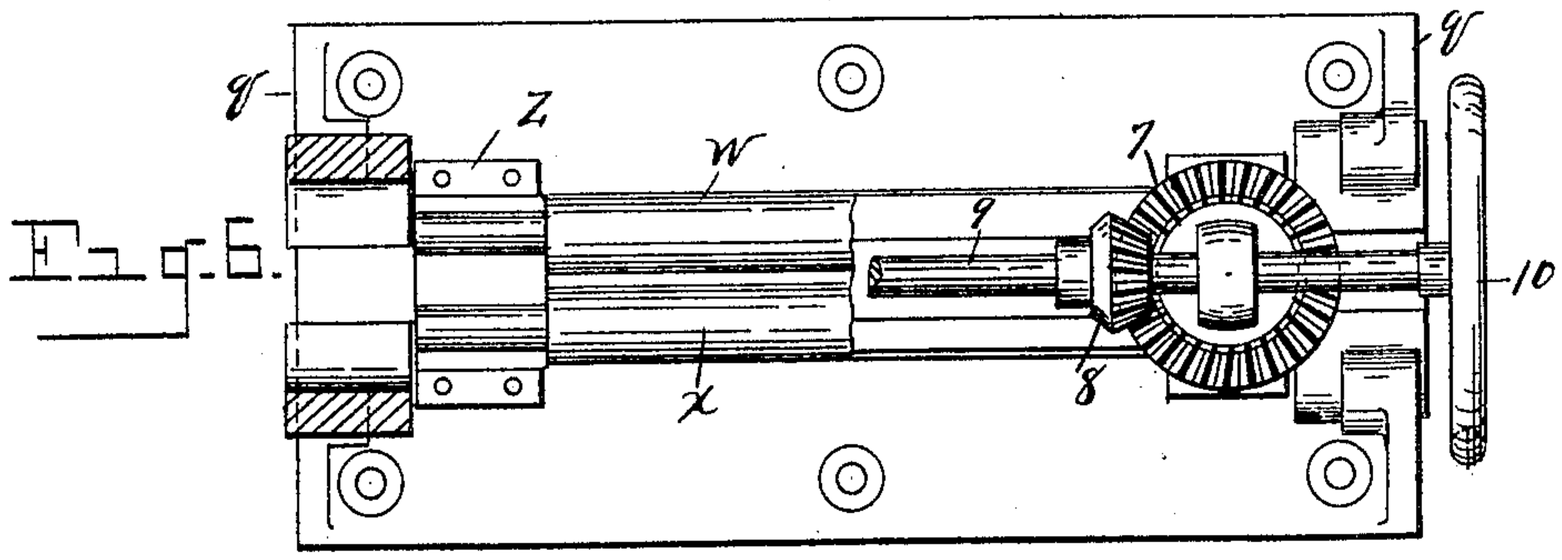

Fig. 6.

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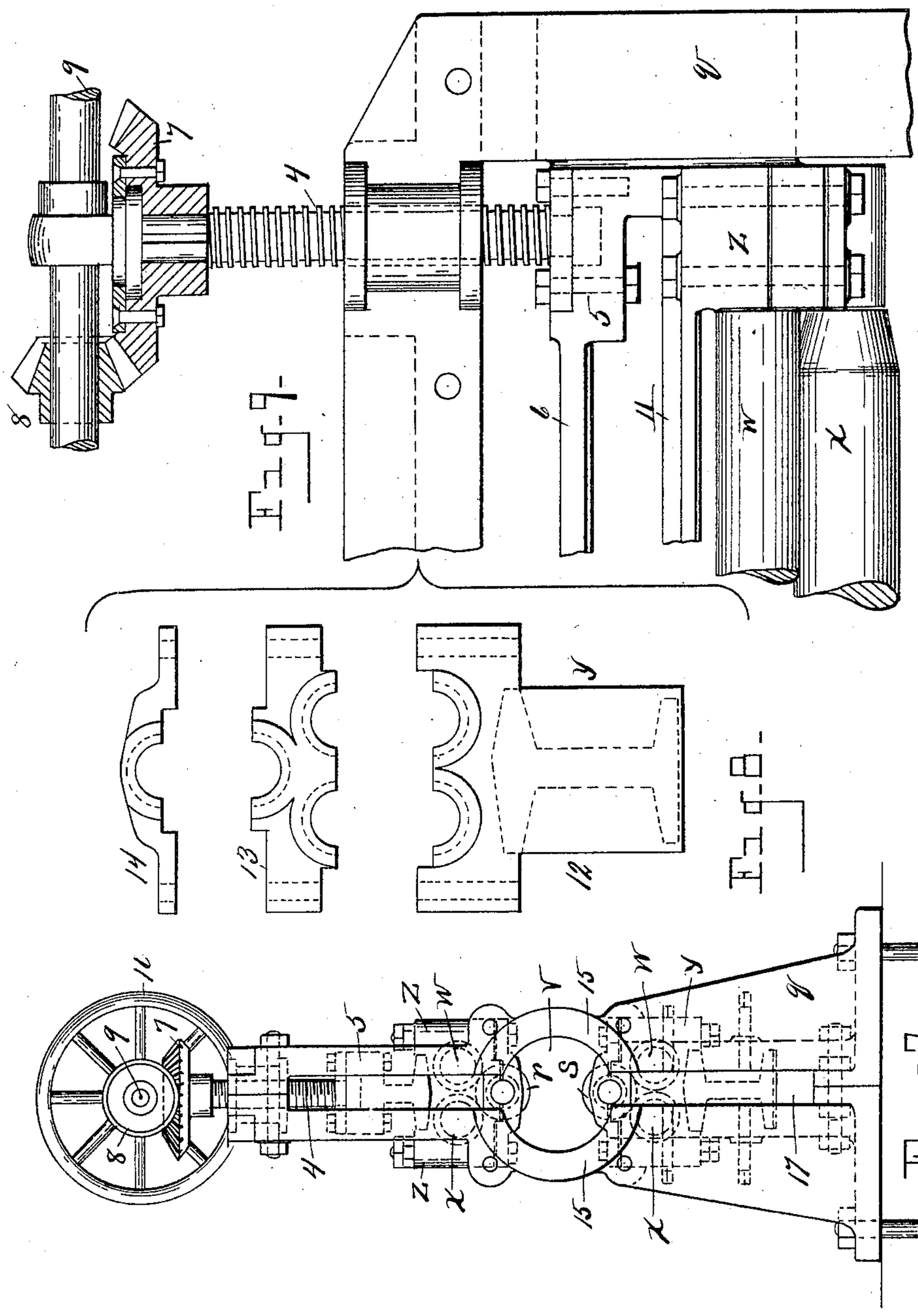
5 SHEETS—SHEET 5.



Witnesses:
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UNITED STATES PATENT OFFICE

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MACHINE FOR PRODUCING SEAMLESS METALLIC TUBES.

No. 803,079. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed March 7, 1904. Serial No. 196,942.

To all whom it may concern:

Be it known that I, GEORGE J. THUST, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Machines for Producing Seamless Metallic Tubes, of which the following is a specification, reference being had to the accompanying drawings, which form a part of this specification.

My invention is designed to provide certain new and useful improvements in a machine for producing seamless metallic tubes.

My invention consists in the construction, combination, and arrangement of parts, as hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation. Fig. 2 is a view, partly in plan and partly in horizontal section. Fig. 3 is a view in end elevation, the axis of the rotary member being omitted. Fig. 4 is a central vertical section through the machine looking toward the opposite end from that shown in Fig. 3. Fig. 5 is a view in front elevation looking toward the roller-guide mechanism shown in side elevation in Fig. 1. Fig. 6 is a view, partly in plan and partly in horizontal section, the billet-rests being omitted. Fig. 7 is an enlarged view, in side elevation, of the roller-guide mechanism. Fig. 8 shows details of the lower-roller bearings. Fig. 9 shows the upper-roller bearings and the means for their adjustment.

The mechanism embodied in my present invention is designed to pass a billet of metal between the faces of rotating members or bodies of desired form, from which the billet receives both a rotary and a longitudinal movement, the billet being forced over a mandrel lying in the axial line of the longitudinal travel of the billet, the billet being thereby converted into a tube or hollow body.

My present invention, among other objects, is designed to provide efficient means of regulating the adjustment of the rotating bodies between which the billet passes, to provide an improved housing in order to secure a desired adjustment of said bodies, also to provide means for efficiently regulating the passage of the billet between said bodies and to hold the same more firmly in place in the axial line of its travel.

My invention comprises two rotary members or bodies, the axes of which have a variable adjustment, mechanism being provided for adjusting the rotatable members nearer to or farther from each other, and also to vary the axial line on which said members rotate.

I carry out my invention as follows:

In the drawings, *a* represents any suitable frame or support, and *b* represents housings mounted thereupon, the same being shown engaged therewith, as by bolts *c*. In said housings are located rotatable barrels *d*, respectively. In each of said barrels is journaled an axis *e* of the corresponding rotary member *f*. My invention contemplates employing two of said housings, each carrying one of said barrels and each barrel carrying one of said rotary members, the housings and their barrels, together with the rotary members, being located upon the support, so that said rotary members face each other, leaving a passage therebetween for the passage of the billet, the billet being rotated and advanced between said members by the rotary action of said members. Any suitable mechanism may be employed to rotate the axes *e* of said members. In the mechanism illustrated in Fig. 2 the billet would advance, for example, between the members *f f* in the direction of the arrow. To adjust the rotary members *f f* nearer to or farther away from each other, I have shown adjusting-screws (indicated at *g*) engaged in the respective housings and with the respective barrels, as shown, or in any suitable manner, whereby the barrels may be moved toward or away from each other, the barrels carrying the rotary members therewith. I prefer to employ two adjusting-screws *g g*, engaged with each housing and with its corresponding barrel. In order to actuate both of the companion adjusting-screws simultaneously, they may each be provided with a corresponding pinion, (indicated at *h*,) an intermediate gear *i*, meshing with both companion pinions, being mounted upon the outer end of the barrel *d*. By means of these adjusting-screws the members *f* may be adjusted for different sizes of billets. The barrels *d* are also made adjustable on the axial line of said barrels, respectively, or, in other words, the barrels are each made partially rotatable in their respective housings, so as to adjust the axial line of the corresponding ro-

tatable member *f* as may be desired. To this end the housings *b* are respectively provided with laterally-extended adjusting-screws *j*, engaging an upwardly-extended arm *k* of the corresponding barrel. By means of these adjusting-screws actuating the corresponding arm *k* it will readily be perceived that the barrel may be rotated on its axial line in either direction. In order that the barrels may each rotate with relation with the corresponding adjusting-screws *g g*, the barrel is formed with circular grooves (indicated at *l*) to receive a head *m* of the corresponding screw *g*. In this way the axial line of the axes *e* may be varied, as indicated by the dotted lines 1 2 3, more particularly in Fig. 4. Removable boxings of the axes *e* are indicated at *n*, secured upon the corresponding ends of the barrels *d* by means of bolts *p*.

Between the vertical planes of the axes *e e* of the rotatable members *f f* and at opposite ends thereof I locate supports *q* of a roller-guide mechanism, (shown more particularly in Figs. 1, 5 to 9,) said supports carrying guide-rolls, (indicated at *r* and *s*,) the one above and the other below the work. In Fig. 1 is shown a billet at *t*, the mandrel over which the billet is drawn being indicated at *u*. The supports *q q* are formed with openings *v* for the passage of the billet and the mandrel. Bearing upon the corresponding rolls *r s* are additional rolls *w* and *x*, arranged in pairs above and below the corresponding rolls *r s*. The roll *s*, with the companion rolls *w x* below the billet, may be journaled in bearings *y*, engaged upon the support *q*. The upper roll *r* with its companion rolls *w x*, however, are made adjustable, the rolls *r*, *w*, and *x* above the billet being carried by adjustable bearings *z*, actuated by the adjusting-screws, (indicated by the numeral 4.) The bearings *z z* are preferably provided with bracket-arms 5, united by an arm 6, the said screw 4 engaging with the arms 5. The adjusting-screws 4 4 in order to simultaneously actuate the adjustable bearings at opposite ends of the upper rolls may be provided with gears 7, meshing with pinions 8 upon the shaft 9, said shaft being preferably provided with an operating hand-wheel 10. A cross-bar 11 is preferably employed to connect the bearings *z z*. The boxes *y* are preferably constructed as shown more particularly in detail in Fig. 8, the lower portion 12 and cap 13 to engage over the corresponding rolls *w x* and with an additional cap 14 to engage over the axes of the roll *s*, the different portions of the said boxes being united by bolts 15. The supports *q* are engaged upon the bed *a*, as indicated in Fig. 1. In Fig. 5 are shown billet-rests 16 16. The bars for the lower rolls *w x* are preferably supported upon the wedge or plate (indicated at 17) and may be raised or lowered by inserting wedges or plates of different thicknesses. It will be obvious that the rotating members *f f* have convex centers to contact with the work.

The housings *d* may simply be recessed, as indicated at 18, to permit the engagement of the adjusting-screws *j j* with the arm *k*, said arm preferably consisting of a separate piece bolted to the housing, as indicated at 19.

It will be evident that the companion rollers *r s* contact longitudinally thereof with the work to hold the work firmly in place as it is being advanced between said guide-rolls and the rotary members *f f*. In this way the work is held steadily in its axial line of travel.

What I claim as my invention is—

1. In a machine for producing seamless metallic tubes the combination of a support, housings upon said support, bodies rotatable in said housings respectively, each provided with bearings at its inner end, a rotatable member journaled in the bearings of each of said bodies, and means to adjust each entire body longitudinally to carry said members toward and away from each other.

2. In a machine for producing seamless metallic tubes the combination of a support, housings upon said support, a body rotatable in each of said housings provided with bearings at its inner end, a rotatable member journaled in each of said bodies, mechanical means to rotate said bodies to adjust the axial line of the corresponding rotatable member, and means to adjust each entire body longitudinally to carry said rotatable members toward and from each other in their respective housings.

3. In a machine for producing seamless metallic tubes the combination of a support, housings upon said support, a rotatable body in each of said housings provided with bearings at its inner end, a rotatable member journaled in the bearings of each of said bodies, mechanical means to rotate said bodies to adjust the axial line of the corresponding rotatable member, and adjusting-screws in said housings arranged to adjust each entire body longitudinally in said housings respectively to carry said rotatable members toward and away from each other.

4. In a machine for producing seamless metallic tubes the combination of a support, housings upon said support, a body rotatable in each of said housings, a rotatable member journaled in each of said bodies, mechanical means to rotate said bodies to adjust the axial line of the corresponding rotatable member, and adjusting-screws arranged to adjust said bodies in their respective housings to carry said rotatable members toward and away from each other, said bodies each constructed with an arc-shaped groove to receive the head of the corresponding adjusting-screw.

5. In a machine for producing seamless metallic tubes, the combination of a support, housings upon said support, a body rotatable in each of said housings, a rotatable member

journaled in each of said bodies, mechanical means to rotate said bodies to adjust the axial line of the corresponding rotatable member, adjusting-screws arranged to adjust said bodies to carry said rotatable members toward and away from each other, and gears upon said adjusting-screws, whereby the adjusting-screws may be actuated simultaneously.

6. In a machine for producing seamless metallic tubes, the combination of a support, housings upon said support, a body rotatable in each of said housings provided with bearings at its inner end, a gear loosely mounted upon the opposite end of said body, rotatable members between which the work is to pass journaled in the bearings of each of said bodies, adjusting-screws passed through said housings and engaged at their inner end with the corresponding body, and gears upon the outer ends of said adjusting-screws meshing with the gear upon the body, and means to adjust the axial line of each of said members at different angles.

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

GEORGE J. THUST.

Witnesses:
N. S. WRIGHT,
N. L. SIMMONS.