

(No Model.)

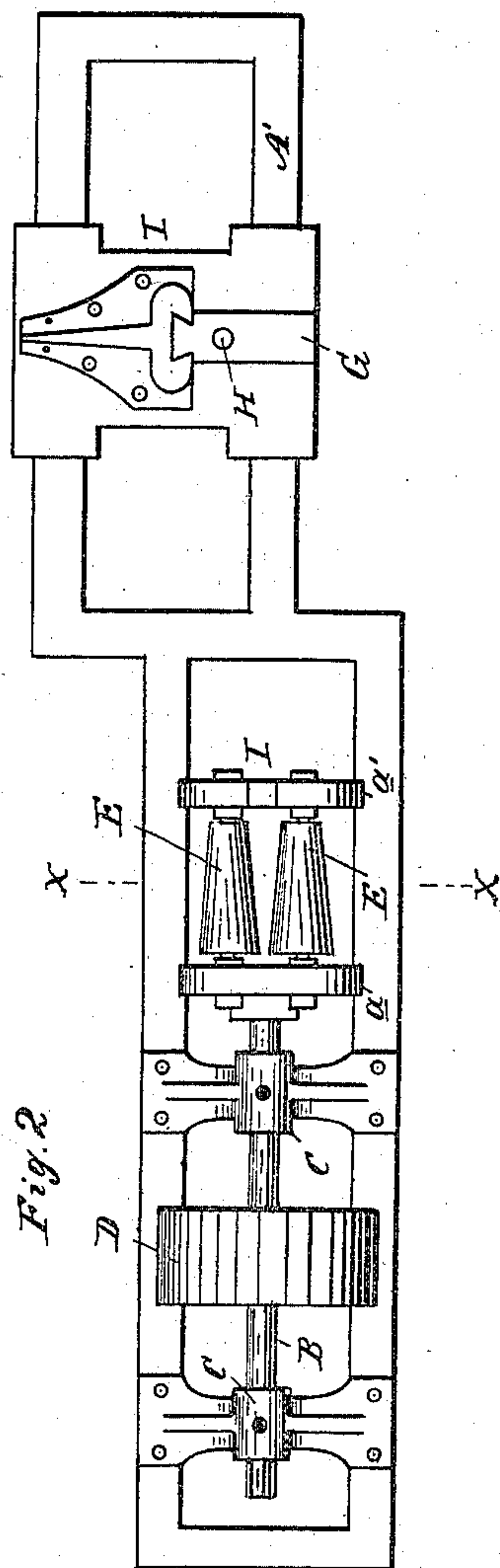
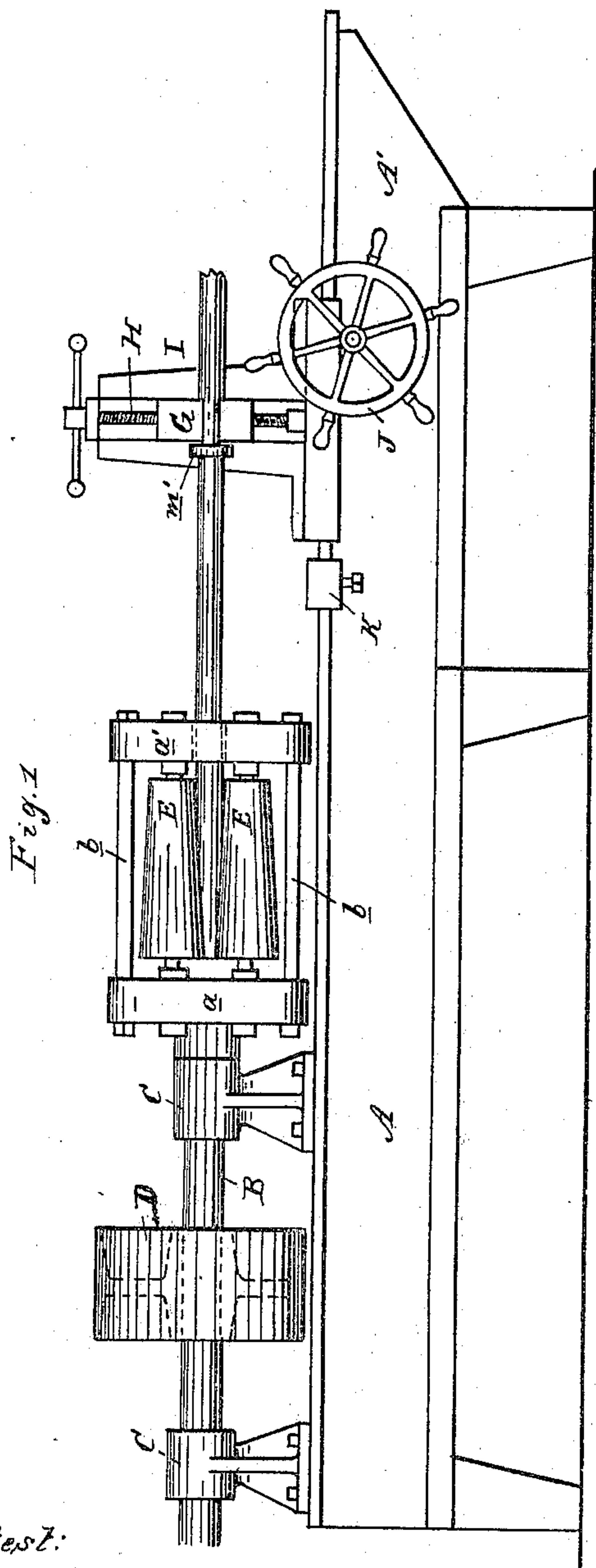
2 Sheets—Sheet 1.

G. M. HUGHES.

ROLLING MACHINE FOR TAPERING BARS.

No. 368,671.

Patented Aug. 23, 1887.



Attest:  
John Schuman.  
M. Sprague

Inventor:  
George M. Hughes.  
by his Atty  
T. J. W. Robertson

(No Model.)

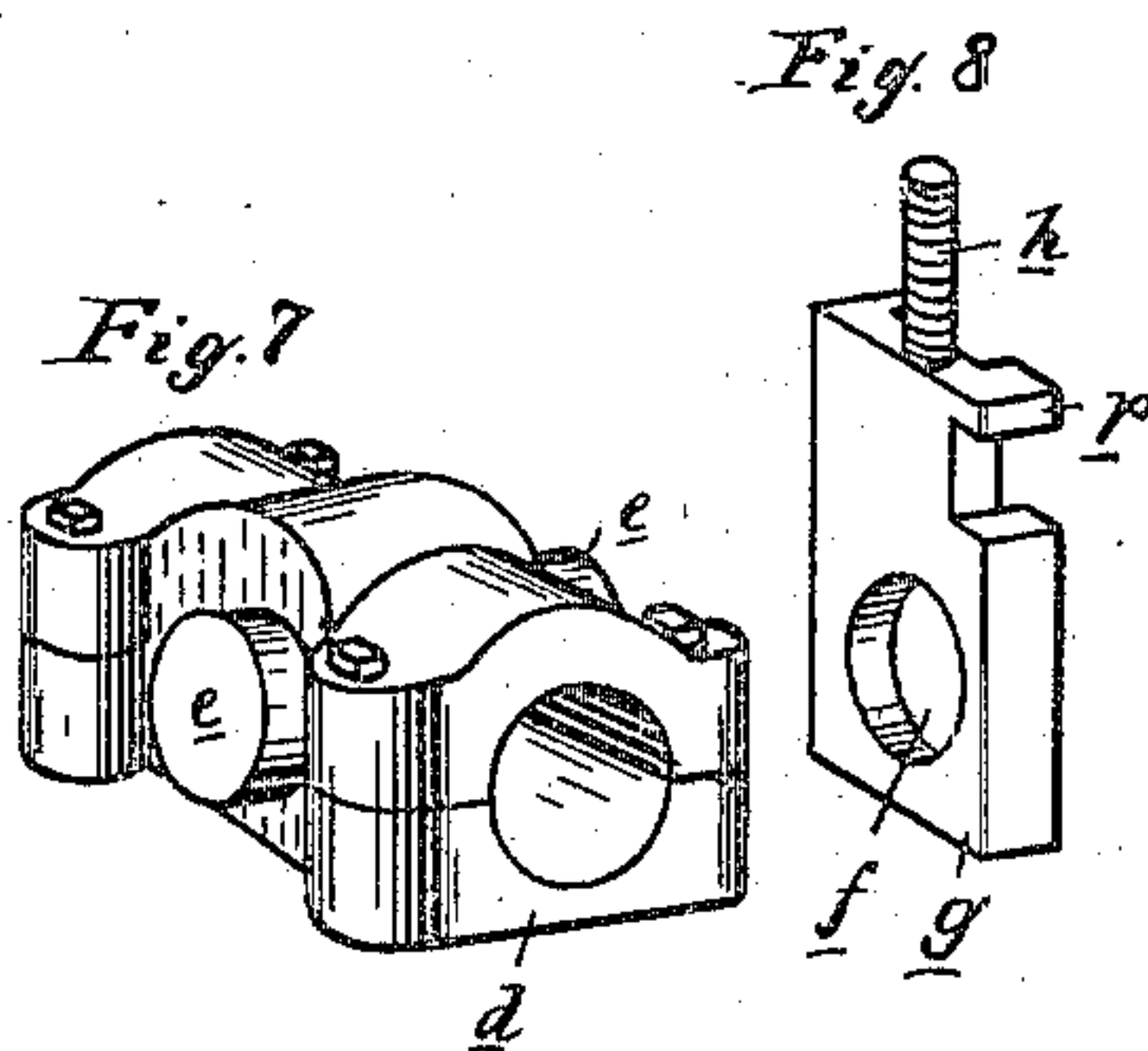
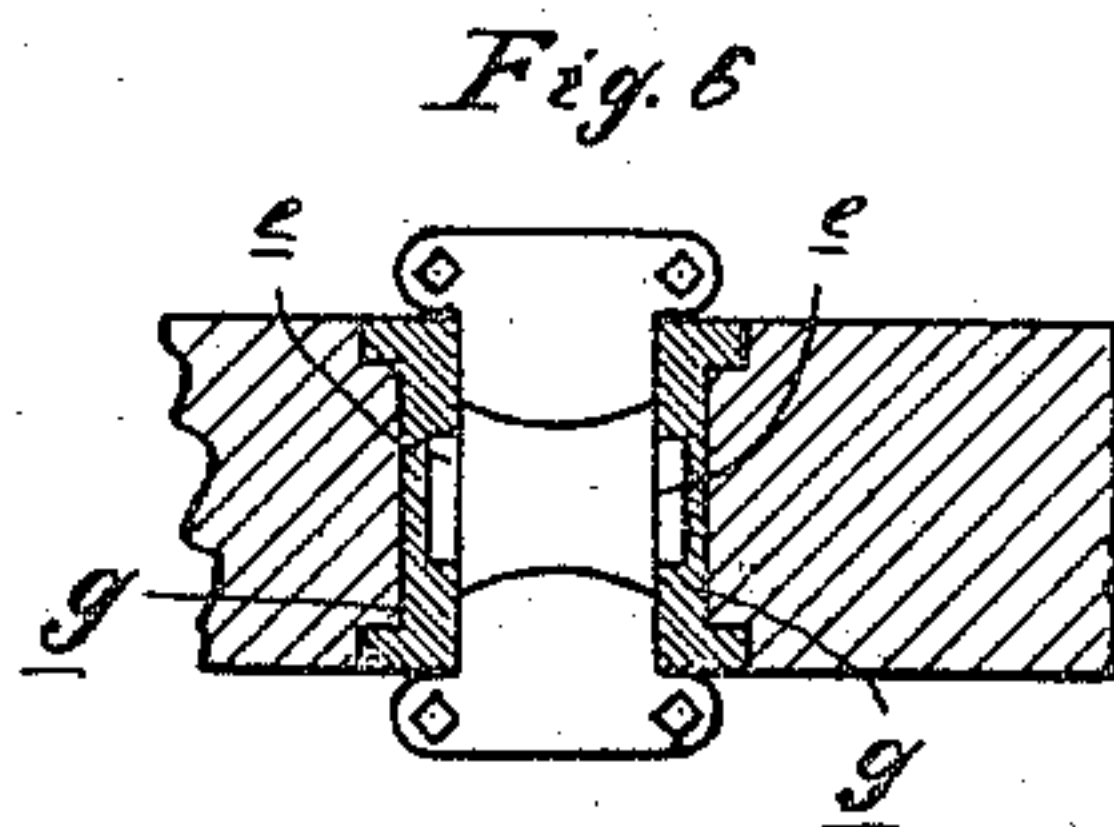
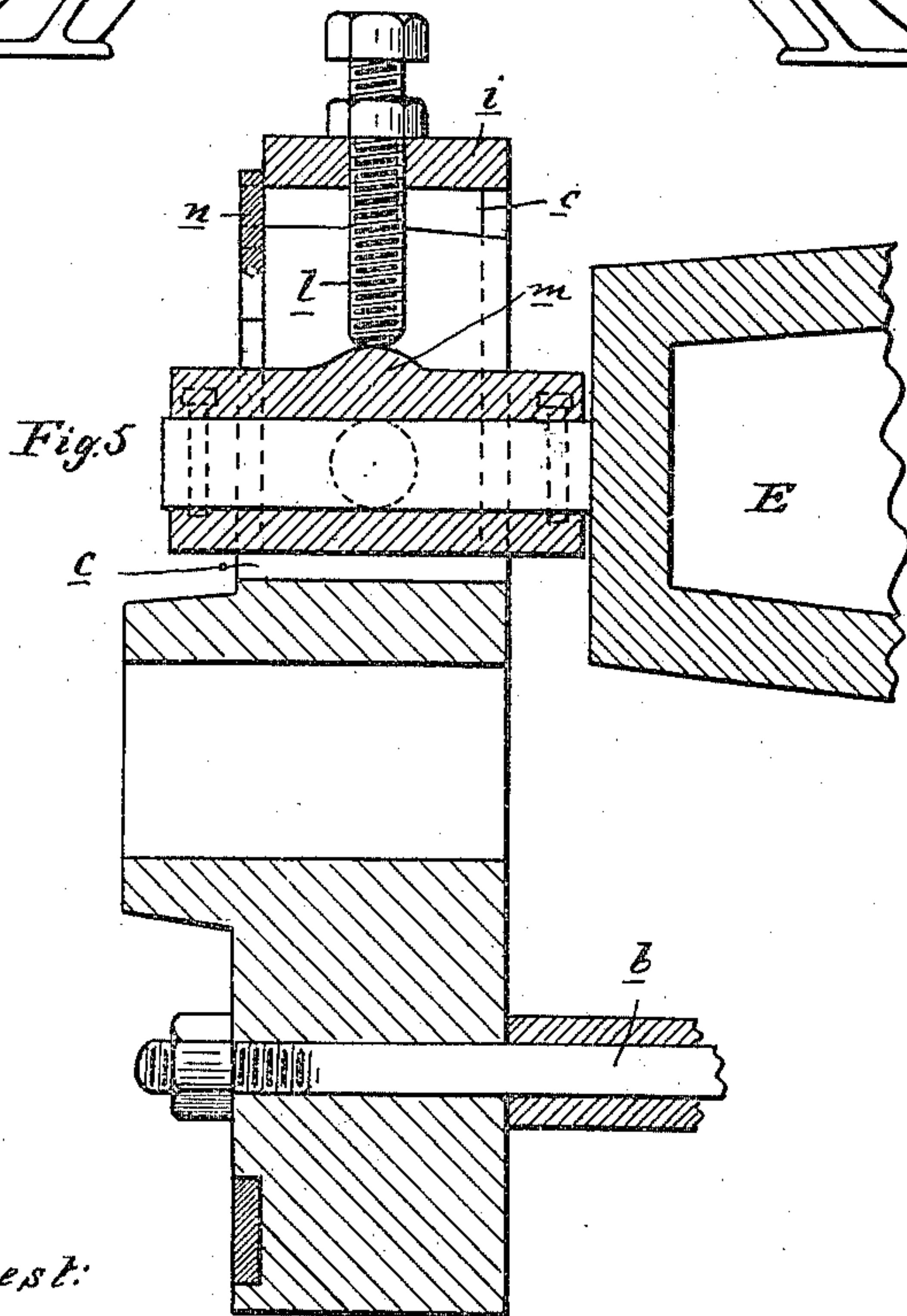
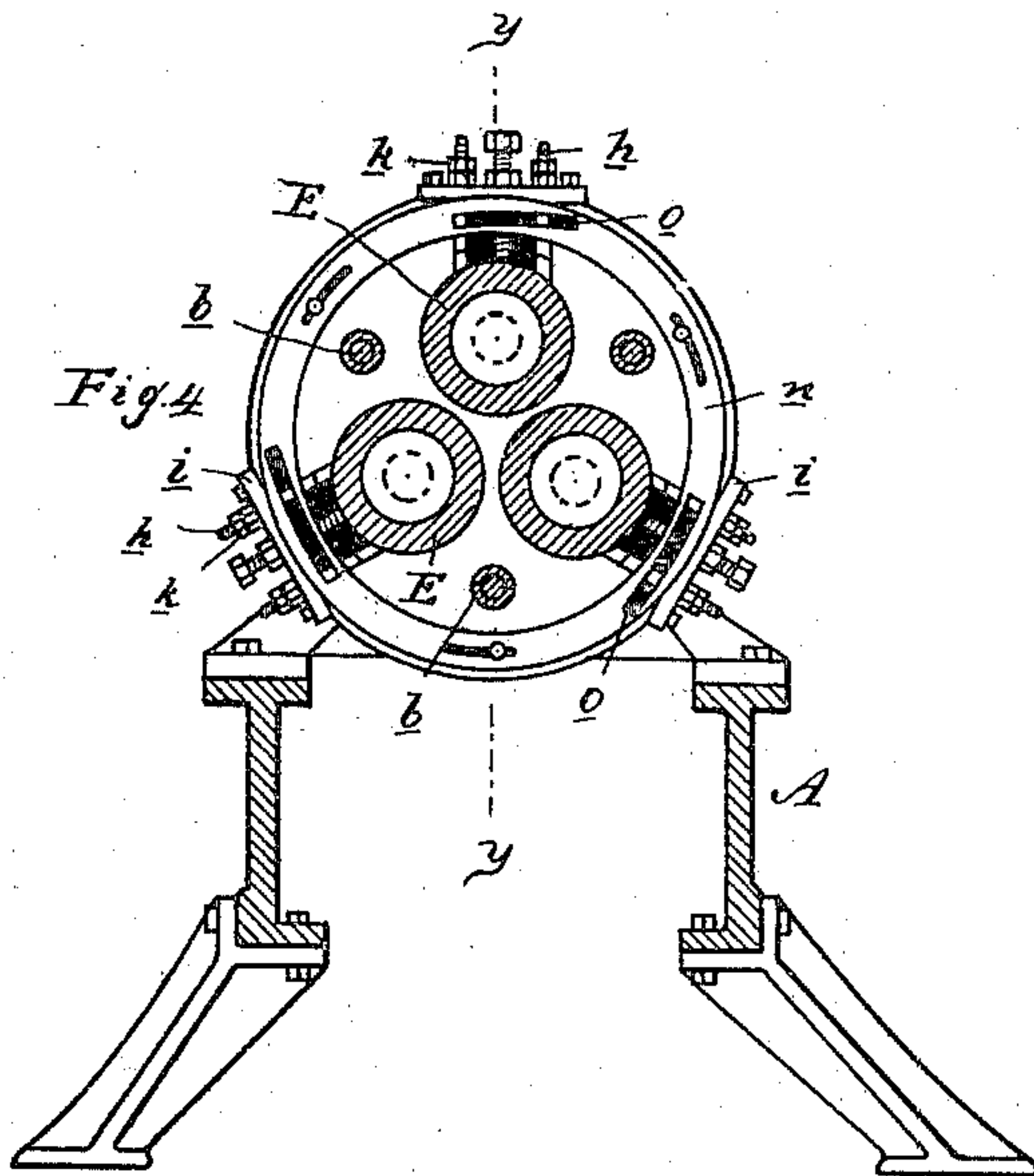
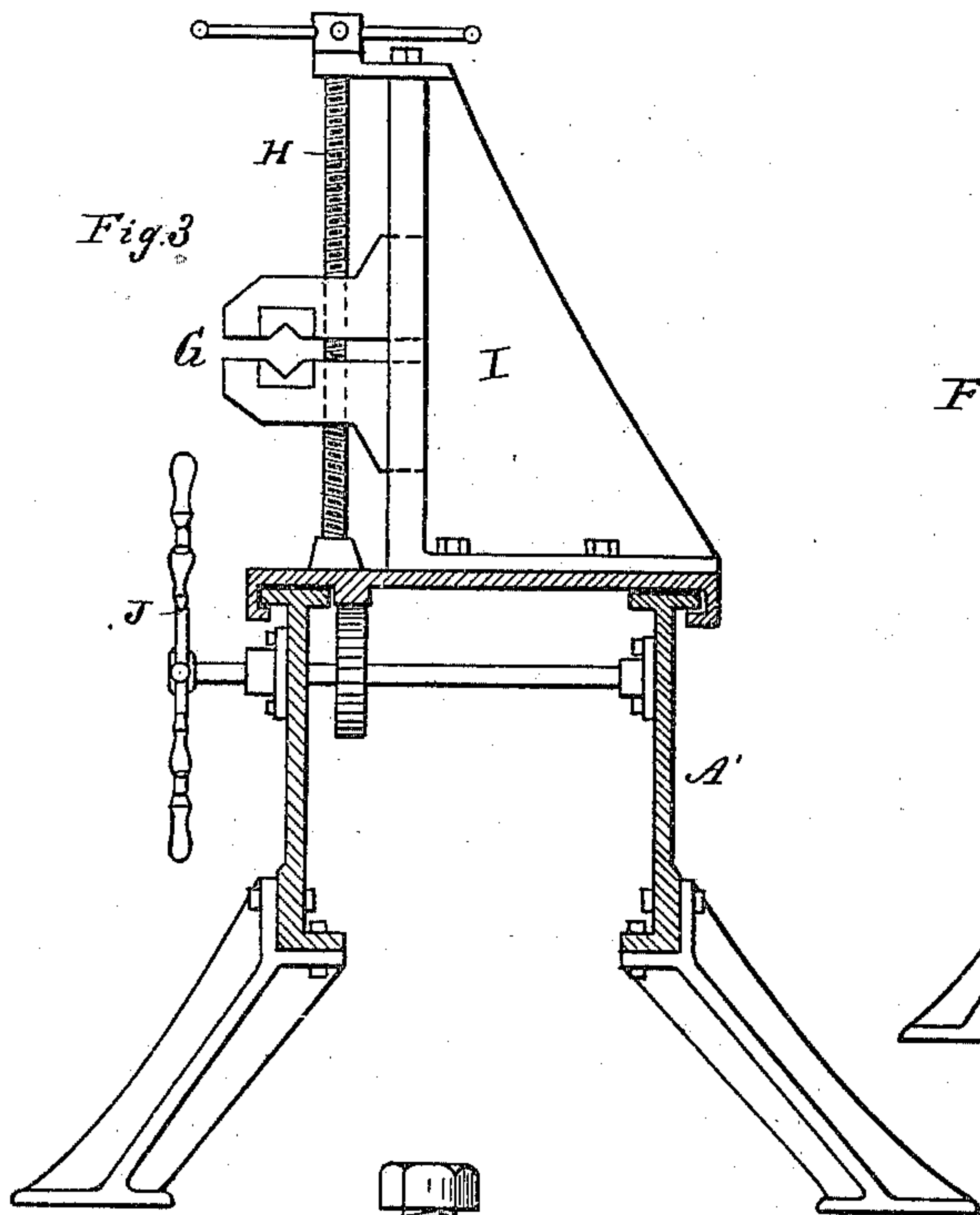
2 Sheets—Sheet 2.

G. M. HUGHES.

ROLLING MACHINE FOR TAPERING BARS.

No. 368,671.

Patented Aug. 23, 1887.



Attest:

John Schuman.  
J. Schuman

Inventor:  
George M. Hughes.

by his Atty

J. W. Robertson



# UNITED STATES PATENT OFFICE.

GEORGE M. HUGHES, OF WAGON WORKS, OHIO, ASSIGNOR TO CHAS. F. MILBURN, OF SAME PLACE.

## ROLLING-MACHINE FOR TAPERING BARS.

SPECIFICATION forming part of Letters Patent No. 368,671, dated August 23, 1887.

Application filed May 12, 1887. Serial No. 237,977. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. HUGHES, of Wagon Works, in the county of Lucas and State of Ohio, have invented new and useful  
5 Improvements in Machines for Rolling Axle-Spindles and other Tubes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a  
10 part of this specification.

This invention relates to new and useful improvements in machines for rolling the spindles of carriage and wagon axles and other tubes; and the invention consists in the im-  
15 proved construction, arrangement, and combination of parts, all as more fully hereinafter described.

In the drawings which accompany this specification, Figure 1 is a side elevation of my im-  
20 proved machine. Fig. 2 is a plan thereof. Fig. 3 is a side elevation of the carriage with the supporting-frame shown in cross-section. Fig. 4 is a cross-section on the line *x x* in Fig. 2. Fig. 5 is a section on line *y y* in Fig. 4. Fig.  
25 6 is a plan of one of the radially-adjustable boxes in which the taper-rolls are journaled. Figs. 7 and 8 are perspective details of these boxes, as indicated by the letters of reference.

A is the supporting-frame of the machine.  
30 B is a shaft journaled in suitable bearings, C. D is a drive-pulley on the shaft B; and E are taper-rolls journaled in bearings in the disks *a a'*, which are secured to each other and to the shaft B, so as to form a single revolving  
35 head in which the taper-rolls are free to turn on their axis. The disks *a a'* are firmly secured together the necessary distance apart by means of stay-bolts *b*. The disk *a* is secured by means of a hub on the end of the shaft B, and the disk  
40 *a'* has a central aperture. The two disks *a a'* have corresponding radial slots *c*, in which the boxes for the taper-rolls are secured radially adjustable.

There are preferably three taper-rolls placed  
45 at equal distances apart and at the same radial distance from the axis of the disks *a a'*, and the boxes *d*, in which these taper-rolls are journaled, are what is termed "rocking boxes," so that the rolls may be adjusted radially in or  
50 out independently at either end so as to change their inclination toward the common axis.

The specific means which I have devised for the radial adjustment of these rolls are as follows: The boxes *d*, in which the rolls are jour-  
naled, are provided with trunnions *e*, and these 55 engage into eyes *f*, formed in the lower ends of radially-adjustable stirrups *g*, one of which is shown detached in Fig. 8. These stirrups engage with the parallel sides of the radial slots *c* in the disks and terminate at their 60 upper ends in threaded bolts *h*, which pass through caps *i*, secured over the peripheral openings of the slots, and are adjustably suspended therefrom by nuts *k*. A screw-bolt, *l*, is threaded through the center of each cap and 65 bears against the top of the box, which is provided at this place with a circular bearing, *m*, which has its center of radius in the axial center of the box.

By means of the construction described it 7c will be seen that each box is free to rock and can be adjusted radially in or out. As it is, however, required to have the boxes in each disk adjusted alike, I provide each disk with a ring, *n*, which has eccentric slots *o*, into which 75 each stirrup engages by means of a suitable lug, *p*, all so arranged that by turning the ring all the stirrups are radially adjusted in or out alike. After the adjustment each box is then 80 firmly secured by its own adjusting devices.

G is a two-part clamp, preferably formed by two sliding clamp-jaws, which carry V-shaped steel blocks, the common center of which is in exact line with the axis of the shaft B, and which are provided with a right and left hand 85 screw, H, for operating them, and are mounted on a carriage, I, which slides on ways on the frame A'. The latter forms an integral portion of the frame A, but makes a rearward off-  
90 set therewith, as shown, whereby a closer ap-  
proach is provided to the carriage.

The carriage is provided with suitable means—such as a rack and pinion—and with a large hand-wheel, J, to apply manual power to approach and retract the carriage toward 95 and from the rolls.

An adjustable stop, K, is provided to stop the advance of the carriage at a desired point.

In practice the machine is devised and ap-  
100 plicable for rolling the spindles of so-called "tubular axles" and other taper-tubes, and the mode of operating is as follows: The blank,



being properly heated at one end, is clamped between the jaws with the heated end toward the rollers, and with a collar, *m'*, previously secured thereon, in contact against the jaws, 5 as shown. Motion being given to the shaft B, the operator, by means of the hand-wheel J, gradually advances the carriage and forces the heated end of the blank into the central space between the rolls, thereby compressing it into 10 the desired shape.

The rolls in being revolved around the common center are free to rotate on their own axis; but they remain in fixed relation to each other during the entire process of rolling, and the 15 machine therefore differs in its construction and operation from other machines of a similar character wherein rolls are employed which impart the desired shape and size by closing down upon the work with a radial movement; 20 and it is obvious that my machine is not alone of a much more simple character, but is capable of superior work in connection with tubular axles and other taper-tubes, as it produces no longitudinal displacement and is susceptible of very accurate adjustment for any and 25 all sizes and shapes of spindles or ends.

It is obvious that the head which carries the taper-rolls may be also supported at the outer end by means of a hollow bearing which permits the introduction of the blank. Such 30 bearing, however, I preferably dispense with by a suitable mechanical construction of the other parts, as I am enabled thereby to shorten the movement of the carriage and enable the 35 operator to perform his work to better advantage.

What I claim as my invention is—

1. In a machine for the purpose described, the combination of a revolving head provided 40 with a series of three or more taper-rolls grouped in adjustable bearings around the center of motion, and a carriage provided with a clamping device and means for advancing and retracting it toward and from the 45 revolving head, all constructed and arranged substantially as and for the purpose described.

2. In a machine for the purpose described, the combination, with the frame A, carrying the taper-rolls E, of the frame A', forming the 50 offset described with the frame A and supporting the carriage I, all substantially as and for the purpose set forth.

3. In a machine for the purpose described, the combination, with the supporting-frame, of the shaft B, journaled in suitable bearings 55 thereon, the revolving head secured to said shaft and consisting of the disks *a a'* and stay-bolts *b*, the taper-rolls E, journaled in radially-adjustable boxes in the disks *a a'* and grouped around the center of motion of the 60 revolving head, and the carriage I, having the clamp-jaws M, the clamp-screw H, and the hand-wheel J, all arranged to operate substantially as set forth.

4. In combination with the rolls E, the radially-slotted disk *a*, the boxes *d*, having trunnions *e* and circular bearing *m*, the stirrups *d*, having eye *f* and screw-bolt *h*, the screw-bolts *l*, and the caps *i*, all arranged to operate 65 substantially as described. 70

5. In combination with the taper-rolls E, the radially-slotted disk *a*, the boxes *d*, the stirrups *g*, radially adjustable within the slots of the disks and carrying the boxes *d*, and the ring *n*, having eccentric slots engaging with 75 the lugs *p* on the stirrups, all arranged to operate substantially as described.

6. In combination with the taper-rolls E, the radially-slotted disks *a a'* and the boxes *d*, supported on trunnions within said slots, and 80 means for radial adjustment, substantially as and for the purpose described.

7. In a machine for the purpose described, in combination with the frame A A', having the offset described, the shaft B, supported in 85 standards C and having drive-pulley D, the three rolls E, journaled in radially-adjustable rocking boxes in a revolving head secured to said shaft, means for radially adjusting all the boxes at one end of the rolls jointly with each 90 other, but independently from the boxes at the other end of the rolls, a carriage having a clamping device to hold the blank in the center of motion of the rolls, and means for operating the carriage to introduce the blank 95 endwise between the rolls, substantially as described.

GEORGE M. HUGHES.

Witnesses:

A. W. GOSSMAN,  
JNO. FARLEY.