

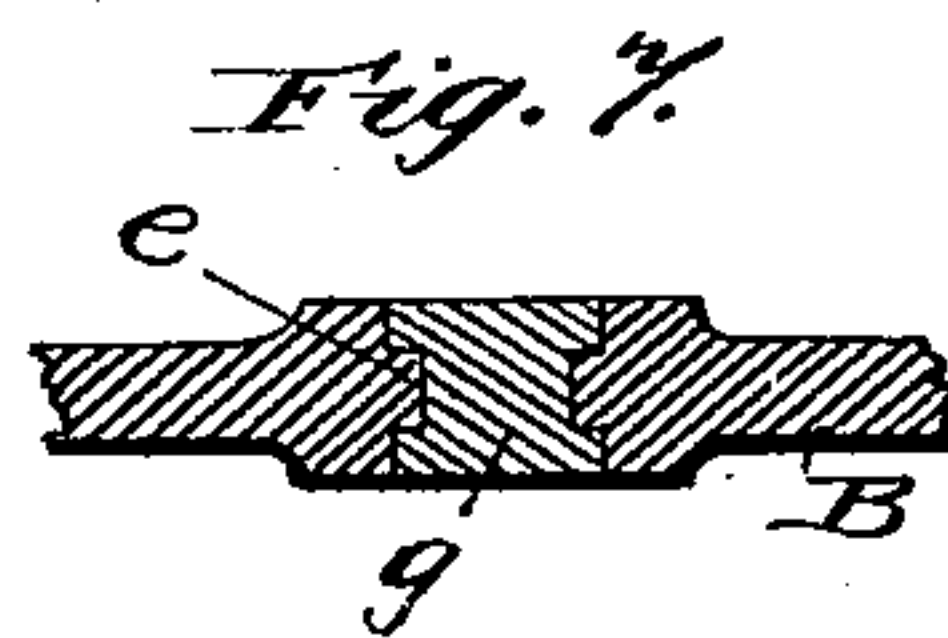
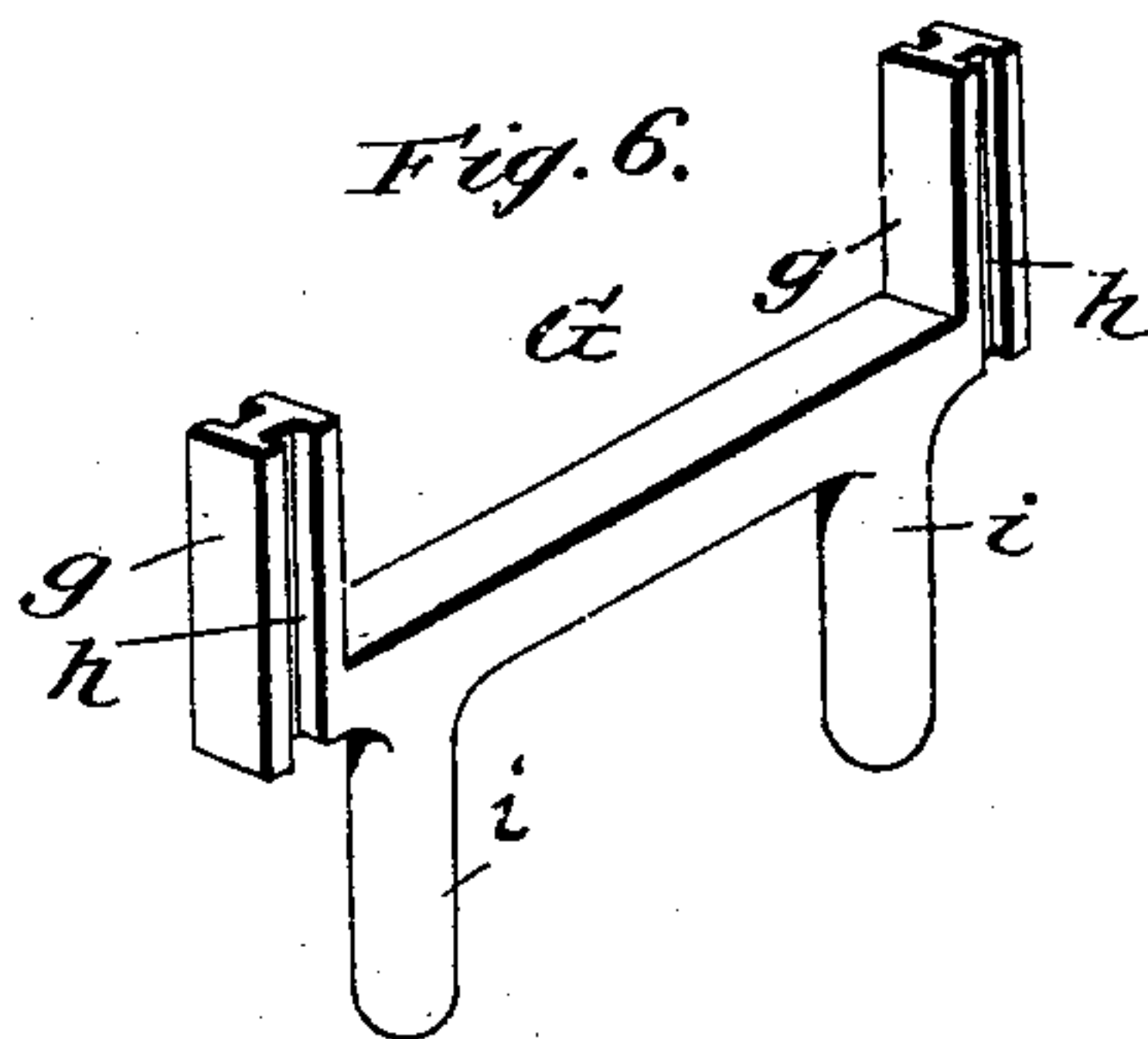
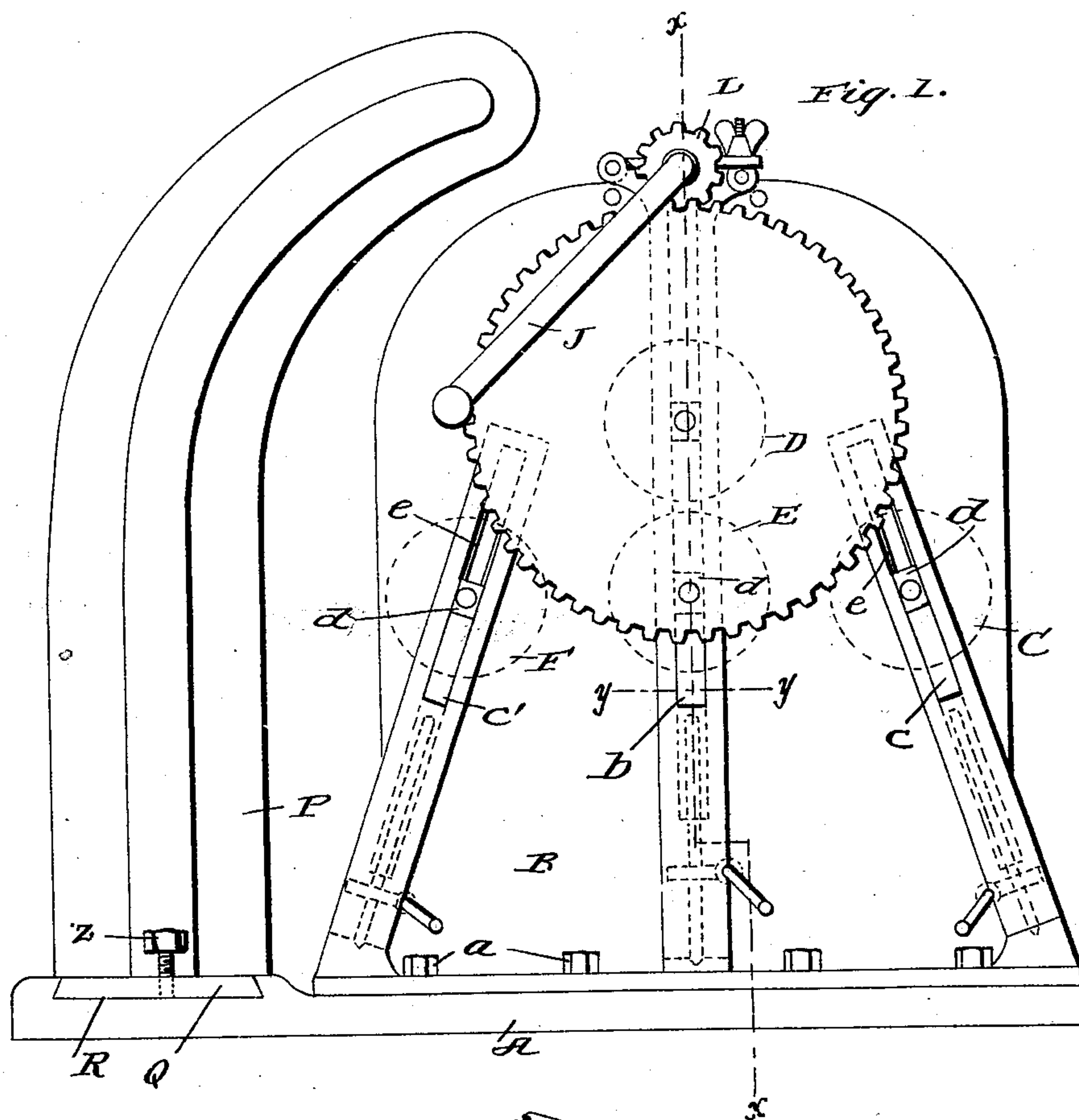
(No Model.)

3 Sheets—Sheet 1.

J. C. ORR.
MACHINE FOR BENDING PIPE.

No. 521,417.

Patented June 12, 1894.



Witnesses:

C. A. Paeder
H. F. Matthews.

Inventor

James C. Orr.

BY

James J. Sheehy
Attorney

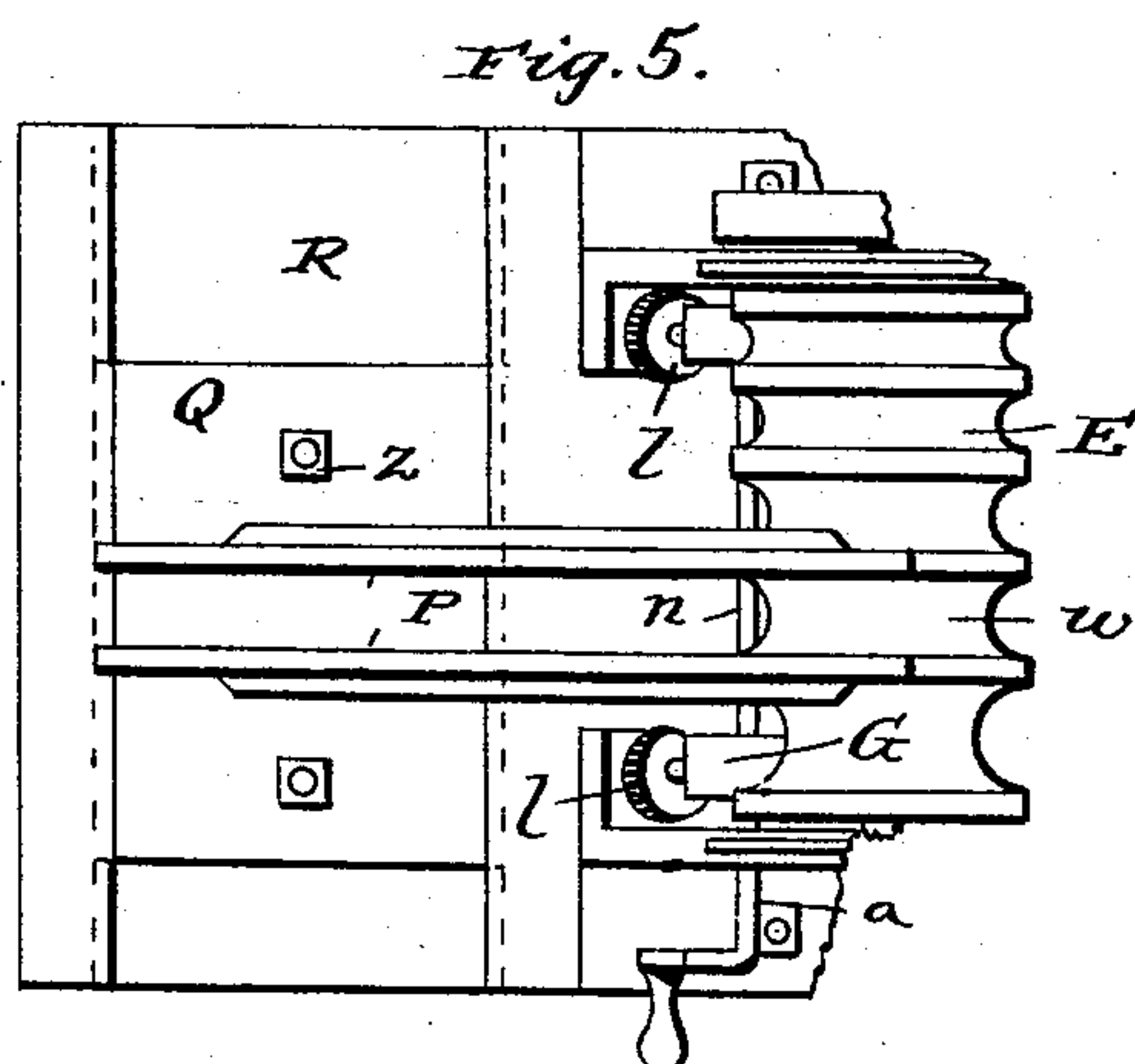
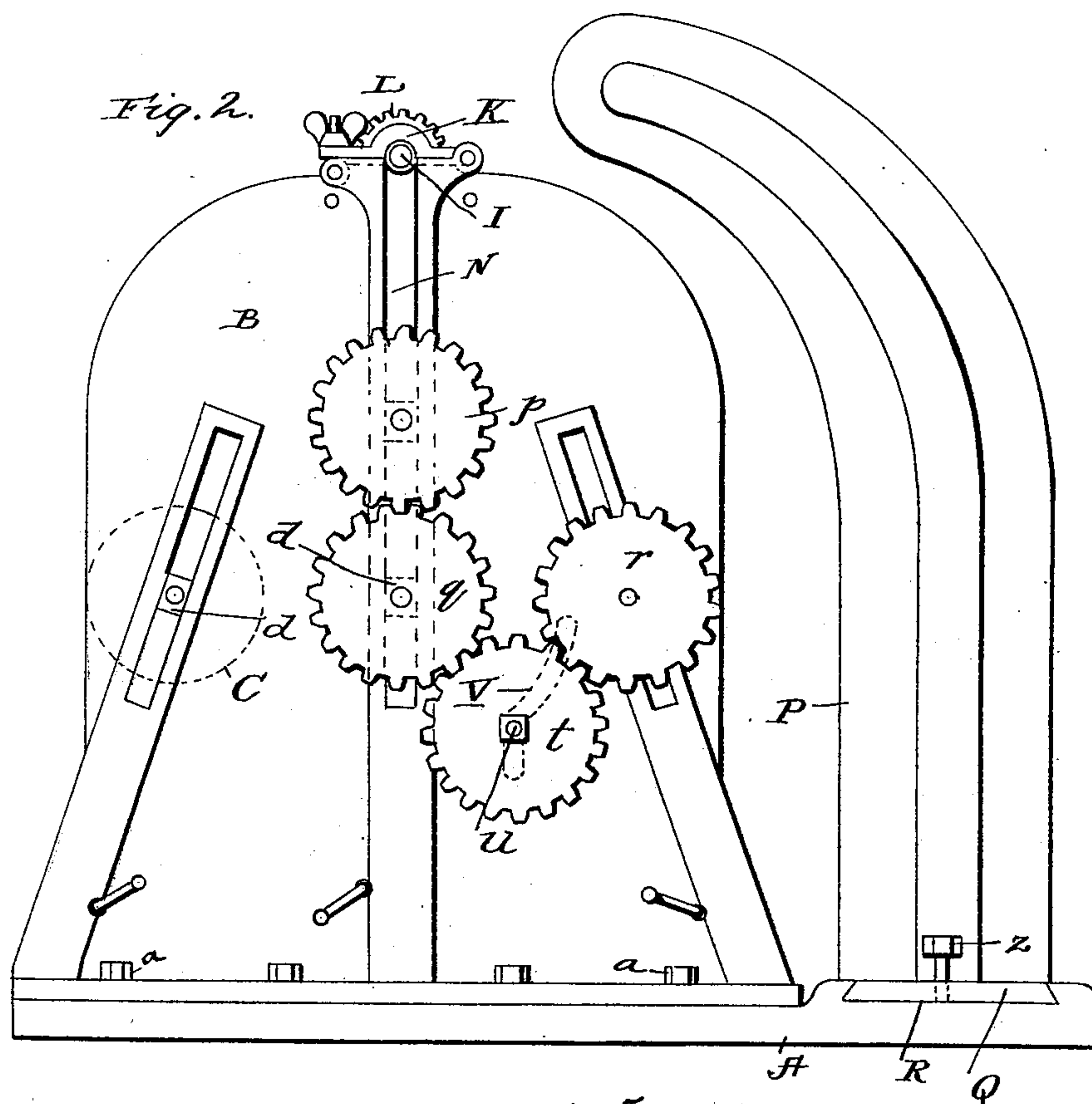
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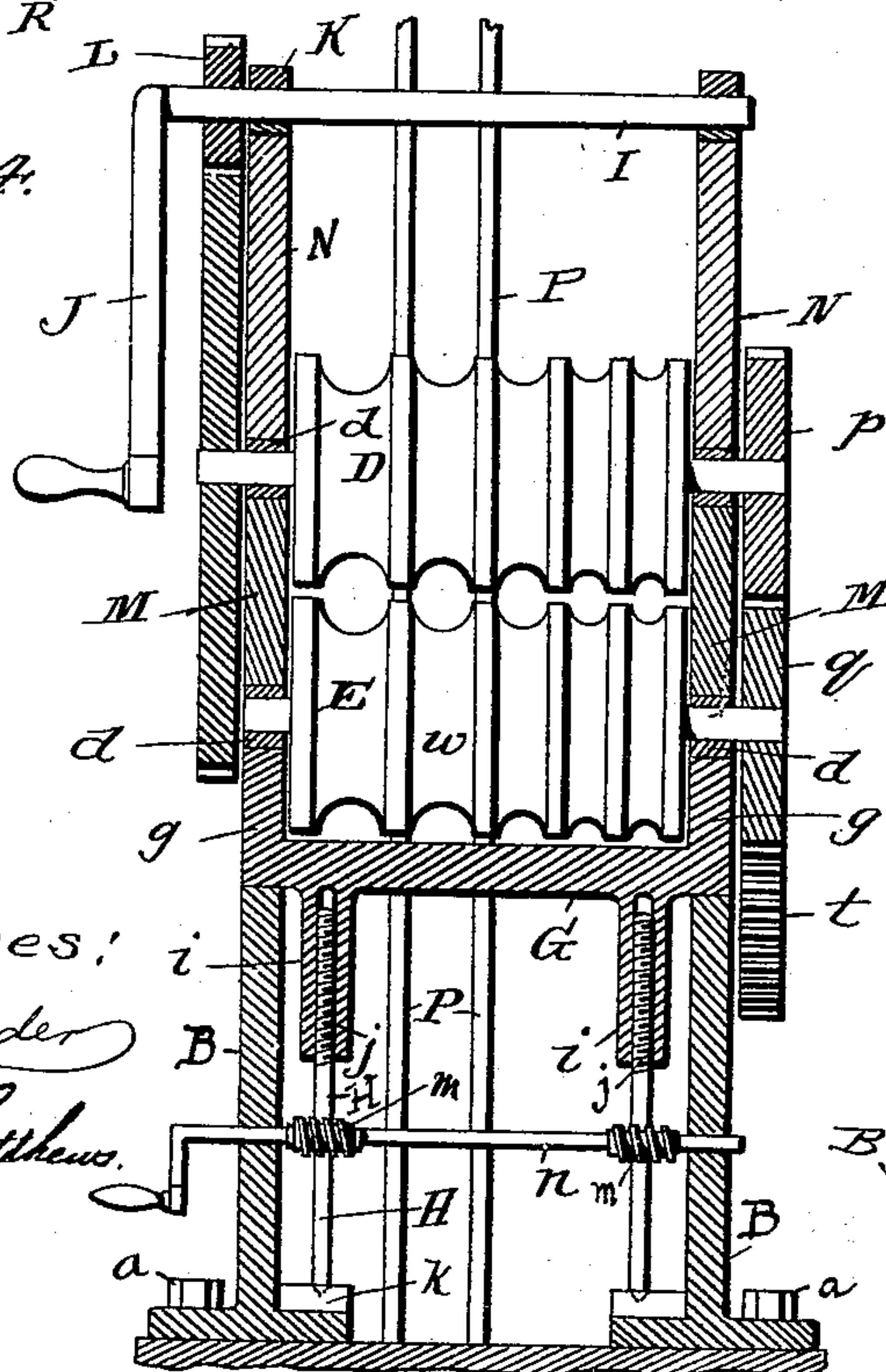
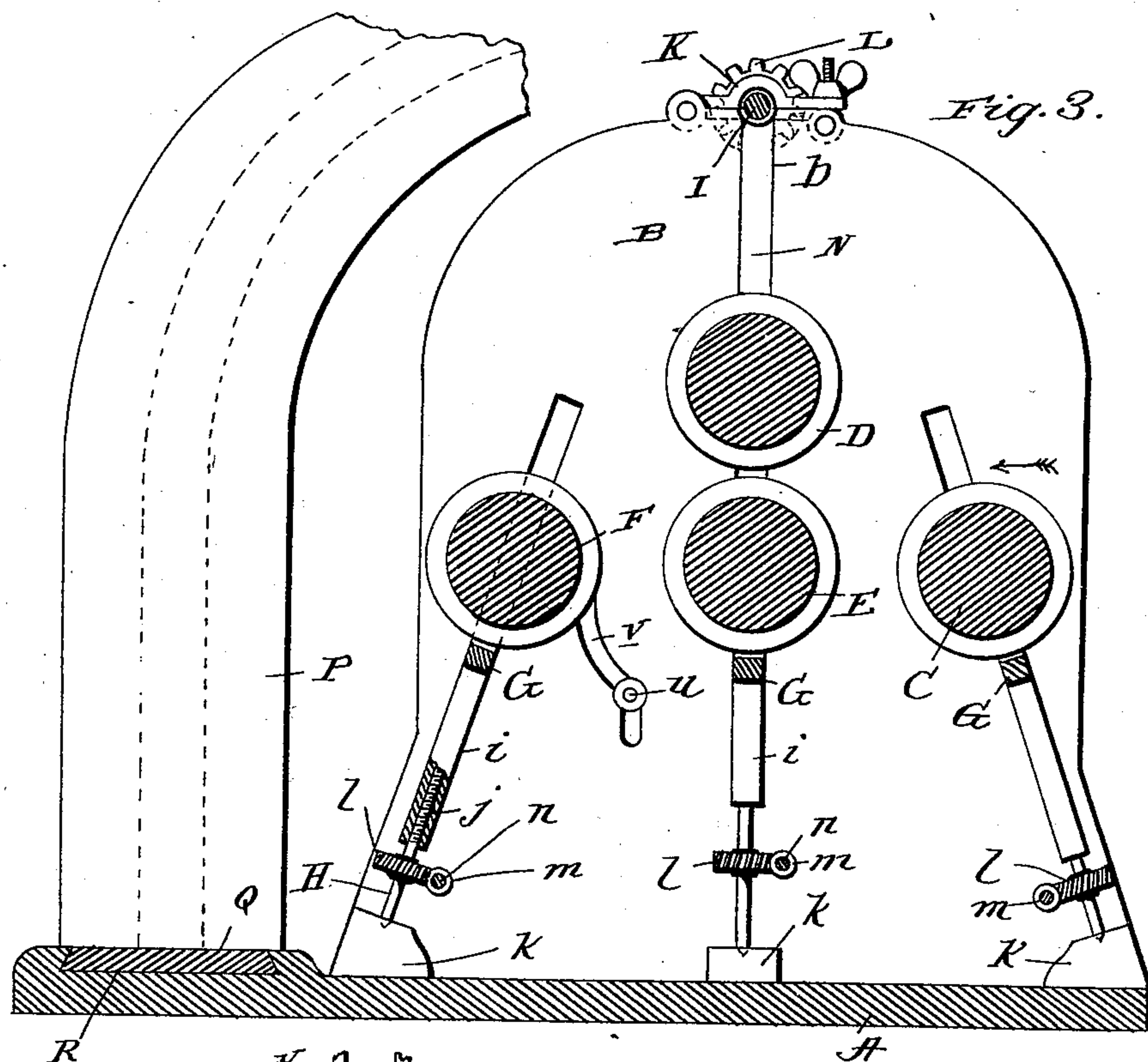
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3 Sheets—Sheet 3.

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witnesses:
 J. Gaeder
 W. H. Matthews.

Inventor
James C. Orr.
By James J. Sheehy
Attorney

UNITED STATES PATENT OFFICE.

JAMES CHAS. ORR, OF WINNIPEG, CANADA.

MACHINE FOR BENDING PIPE.

SPECIFICATION forming part of Letters Patent No. 521,417, dated June 12, 1894.

Application filed March 8, 1894. Serial No. 502,907. (No model.)

To all whom it may concern:

Be it known that I, JAMES CHAS. ORR, a subject of the Queen of Great Britain, residing at Winnipeg, in the county of Selkirk and Province of Manitoba, Canada, have invented certain new and useful Improvements in Machines for Bending Pipe; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for bending metal pipes, rods, &c., and its novelty will be fully understood from the following description and claims when taken in conjunction with the annexed drawing, in which—

Figure 1, is an elevation of one side of my improved machine. Fig. 2, is an elevation of the opposite side thereof. Fig. 3, is a longitudinal, central section. Fig. 4, is a transverse section taken in the plane indicated by the line x, x , of Fig. 1. Fig. 5, is a detail plan view. Fig. 6, is a detail perspective view of one of the adjustable yokes, removed, and Fig. 7, is a detail section showing one of the side bars of a yoke in a way or slot of one of the standards or uprights.

Referring by letter to said drawings:—A, indicates the base or bed of my improved machine, and B, indicates the standards or uprights. These standards or uprights B, may be connected to the bed A, by bolts a , or in any other approved manner and they are respectively provided with a central, vertical slot or way b , and vertical or vertically-oblique slots or ways c, c' , which latter are disposed on opposite sides of the slot b , as illustrated. The said slots b, c, c' , are designed to receive the slidable bearing blocks d , in which are journaled the shafts of the rollers C, D, E, F, and the standards are therefore provided in the slots with the ribs e , to engage grooves in the bearing blocks so as to prevent casual displacement of said blocks.

G, indicates yokes or yoke-frames through the medium of which the rollers C, E, F, are adjusted and held in their adjusted positions. These yoke frames G, have their side bars g , provided with grooves h , to engage the ribs e , in the slots c, c' , and said yoke frames are also provided with the depending projections

i , which have threaded bores j , for the reception of the jack screws H, as shown in Fig. 3.

The jack screws H, have their lower ends stepped in suitable bearings as k , (see Fig. 3,) and they are provided at an intermediate point of their length with gear wheels l , which wheels l mesh with the worm screws m , upon the transverse crank shafts n , whereby it will be seen that when the said shafts are rotated, the rollers C, E, F, will be moved with respect to the roller D. Thus the machine may be quickly and easily adapted for bending pipes, rods, and the like into curves of various degrees, and when desired, the rollers may be brought into such relative positions as to enable the machine to straighten crooked pipe.

I, indicates the drive shaft of the machine. This shaft I, is provided at one end with a suitable crank J, and is preferably journaled in suitable bearings carried by the pivoted cap blocks K, so that it may be lifted out of the slots b , for a purpose presently described. The said shaft I, is also provided with a pinion L, and this pinion meshes with a large gear wheel M, on the shaft of the roller D, whereby it will be seen that when the shaft I, is rotated, the roller D, will also be rotated so as to draw the pipe, rod, or other article to be bent or straightened, through the machine.

In some cases, the rotation of the roller D, is insufficient to draw a pipe or rod through the machine and I therefore contemplate transmitting positive motion from the roller D, to the roller C, so that said roller C, will assist in feeding the pipe. To this end, I provide the shafts of the rollers D, E, with gear wheels p, q , which mesh as shown, and I also provide the shaft of the roller C, with a gear wheel as r . Motion is transmitted to this gear r , from the gear q , through the medium of the gear t , which is mounted upon a short shaft u , arranged and adapted to be adjustably fixed in a slot v , in one of the standards. By this construction it will be perceived that when it is not desirable to transmit motion to the gear r , the gear t , may be readily moved out of engagement with said gear r , and the gear q .

M, indicates blocks which are fixed in the slots b , and are designed to prevent downward movement of the roller D; and N, indicates

blocks which are arranged in the slots *b*, above the blocks *d*, of the roller D, and are designed to prevent upward movement of the roller D. These latter blocks N, are removable, and consequently it will be seen that inasmuch as the cap blocks K, may be unfastened and thrown back, the shaft I, and the roller D, may be readily removed from the standards so as to permit of the withdrawal of a pipe which could not, on account of its curvature, be otherwise withdrawn.

In order to adapt the machine to work pipes and rods of various diameters, I provide the several rollers with peripheral grooves *w*, of various sizes (see Fig. 4); and in order to guide the pipes and rods as they leave the machine, I provide the vertical, parallel guides P. These guides P, are formed integral with or fixedly connected to a dovetail block Q, and said block is arranged and designed to be adjustably fixed by set screws *z*, in a groove R, of similar form in the bed A. The groove R, extends the full width of the bed and consequently it will be seen that the guides P, may be fixed in alignment with any one of the peripheral grooves in the roller.

In the practical operation of my invention, when it is desired to use my machine to bend crooked pipes or rods, the rollers C, F, are adjusted to the positions shown in Fig. 3, and the roller E, is lowered to admit of the introduction of the pipe between it and the roller D, and is then raised through the mechanism described so as to pinch the pipe. The rollers are then turned as described when the pipe will take through the machine in the direction indicated by arrow and will be straightened.

When it is desired to use the machine to curve or bend the pipe, the rollers C, F, are adjusted and adjustably fixed according to the curvature desired and the pipes or rods are passed through the machine in the manner before described.

It will be seen from the foregoing description taken in conjunction with the drawings that my improved machine is very simple and may be manufactured very cheaply; that the parts may be easily adjusted and are not liable to get out of order, and that the machine may be operated with the exercise of but little effort, which is a desideratum.

I have specifically described the construction and relative arrangement of the several parts of my improved machine in order to impart a full and clear understanding of the same, but I do not desire to be understood as confining myself to such specific construction

and arrangement as such changes or modifications may be made in practice as fairly fall within the scope of my invention.

Having described my invention, what I claim is—

1. In a machine for bending and straightening pipe, the combination of the bed, the standards rising from the bed, the rollers journaled in suitable bearings in the standards and having peripheral grooves, a dovetail block or slide arranged in a transverse groove in the bed and carrying vertical guides, and a suitable means for adjustably fixing the said block or slide, substantially as and for the purpose set forth.

2. In a machine for bending and straightening pipe, the combination of the standards having vertical slots or ways *b*, and the vertical or vertically-oblique slots or ways *c*, *c'*, disposed on opposite sides of the vertical slots or ways *b*, the roller D, the roller E, journaled in adjustable bearings arranged in the vertical ways or slots *b*, the rollers C, F, journaled in adjustable bearings arranged in the vertical or vertically-oblique ways or slots *c*, *c'*, the adjustable yoke frames engaging the bearings of the rollers C, E, and F, and having projections provided with threaded bores, the screws bearing upon a suitable support and taking into the threaded bores of the yoke frames, and a suitable means for rotating the screws, substantially as specified.

3. In a machine for bending and straightening pipe, the combination of the standards having the vertical slots or ways *b*, and the vertical or vertically-oblique slots or ways *c*, *c'*, disposed on opposite sides of the vertical slots or ways *b*, the roller D, having its shaft journaled in bearings in the vertical slots or ways *b*, the roller E, also having its shaft journaled in adjustable bearings in the vertical slots or ways, the rollers C, F, having their shafts journaled in adjustable bearings in the vertical or vertically-oblique slots or ways *c*, *c'*, gear wheels mounted on the shafts of the said rollers C, D, E, F, the short shaft *u*, arranged and adapted to be adjustably fixed in a slot *v*, in one of the standards and the gear wheel *t*, mounted on said short shaft and adapted to mesh with the gear wheels on the shafts of the rollers C, and E, substantially as specified.

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

JAMES CHAS. ORR.

Witnesses:

CHARLES H. RAEDER,
THOS. E. TURPIN.