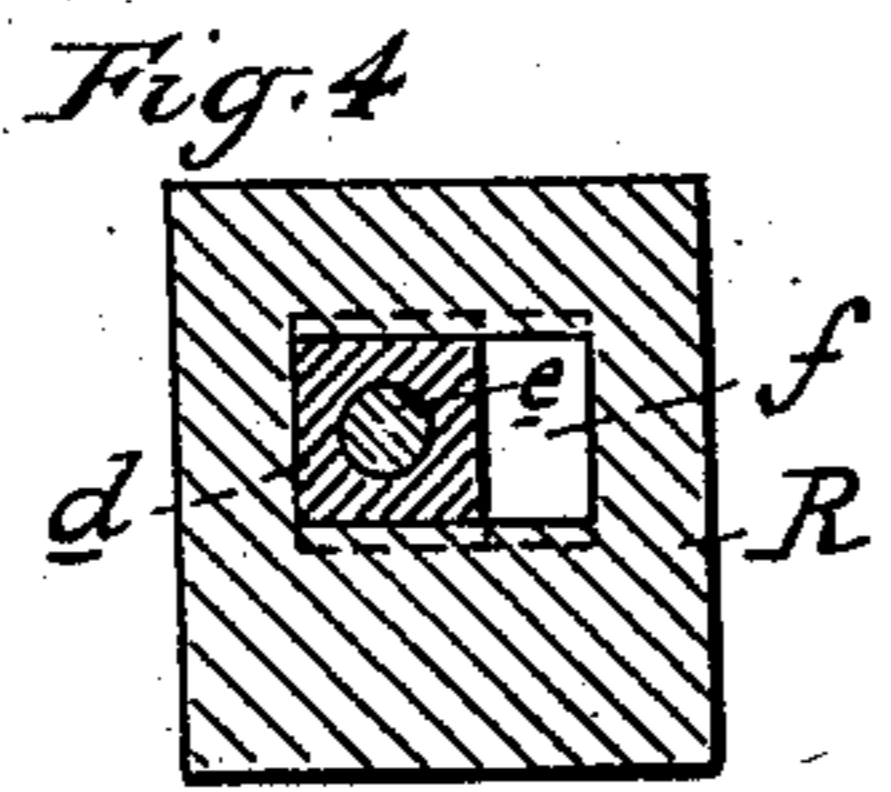
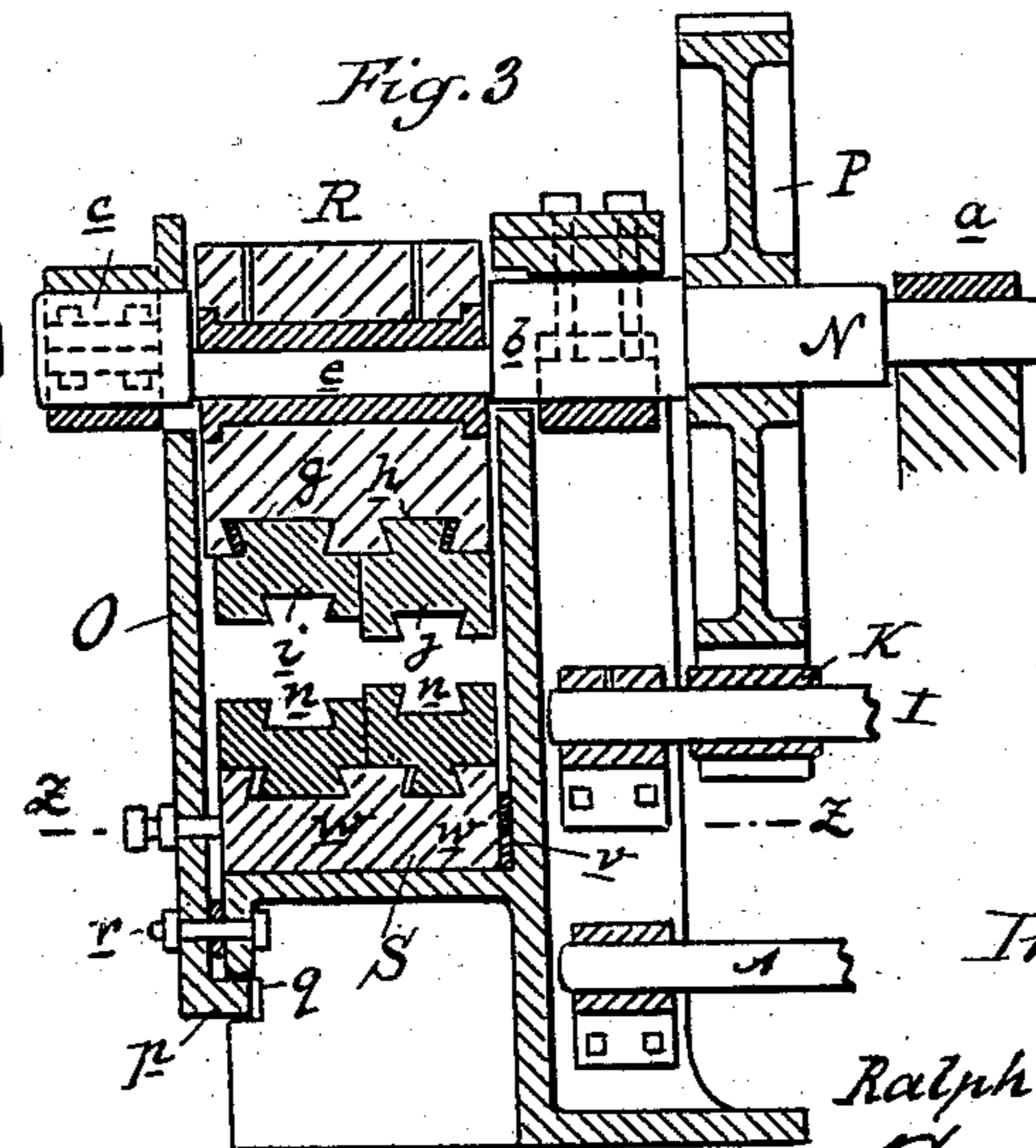
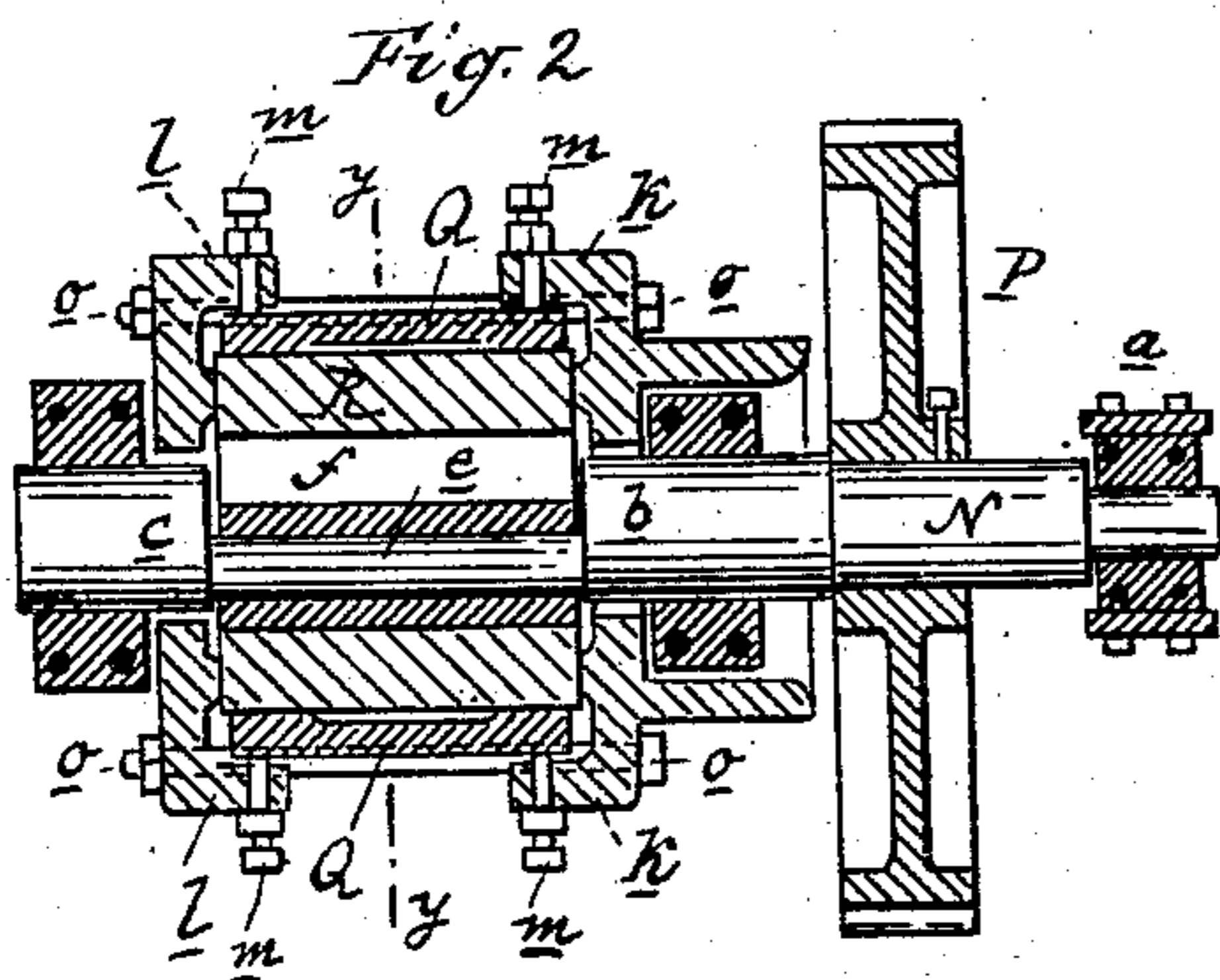
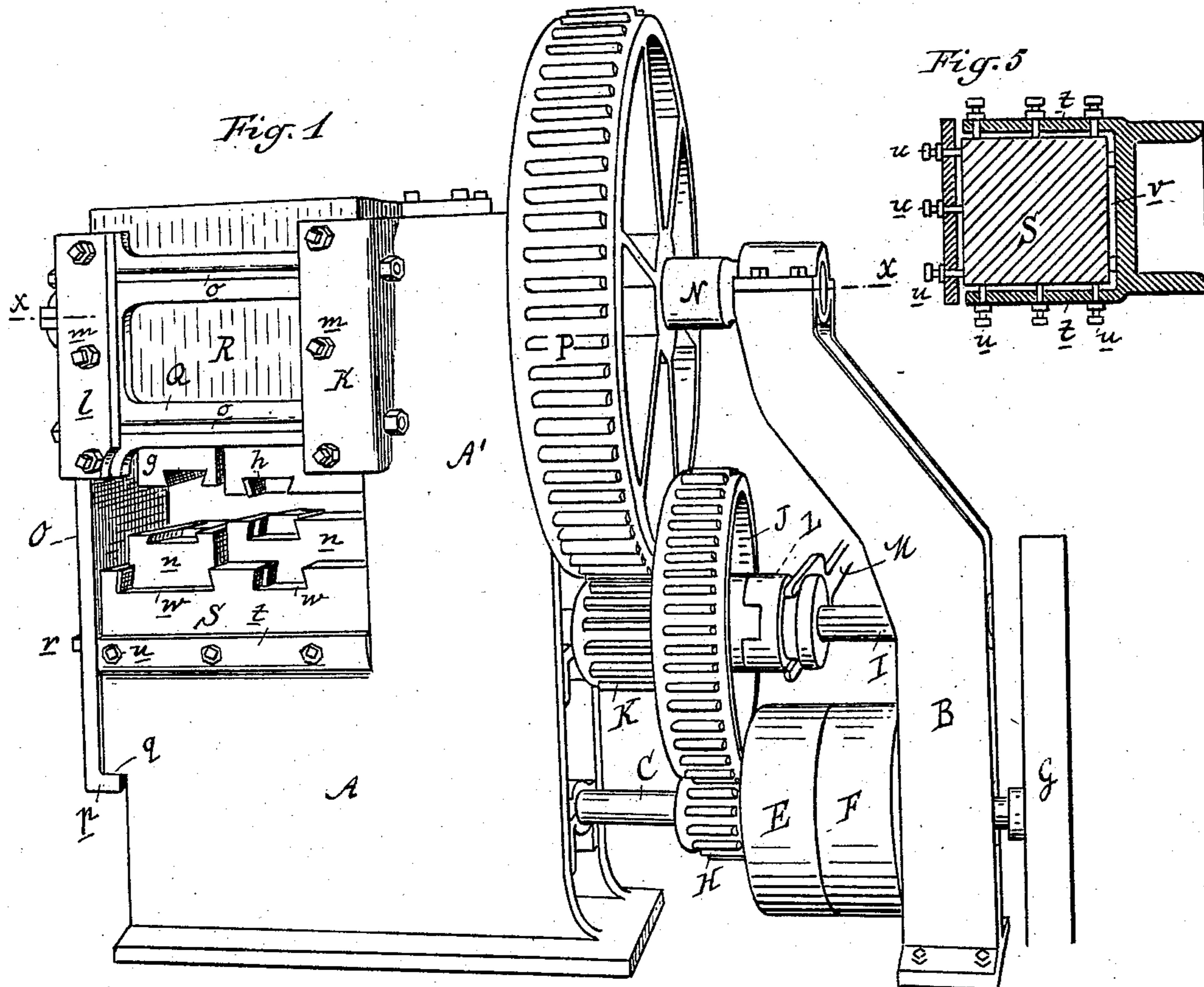


(No Model.)

R. H. BEACH.
FORGING MACHINE.

No. 298,055.

Patented May 6, 1884.



Attest:
A. Barthol
H. Sprague

Inventor:
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UNITED STATES PATENT OFFICE.

RALPH H. BEACH, OF FLINT, MICHIGAN.

FORGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 298,055, dated May 6, 1884.

Application filed July 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, RALPH H. BEACH, of Flint, in the county of Genesee and State of Michigan, have invented new and useful Improvements in Forging-Machines; 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 part of this specification.

This invention relates to an improvement in forging-machines such as are used for forging a variety of small articles, and wherein a heated piece of iron is first pressed between registering dies secured to a plunging mandrel and stakes, and then trimmed off by a similar operation between another die and a punch; and the improvement consists in the construction, arrangement, and combination of the different parts, all as more fully hereinafter described.

In the accompanying drawings, Figure 1 is a perspective view of my improved machine. Fig. 2 is a horizontal section thereof on line *x x*. Fig. 3 is a vertical central section of the same. Fig. 4 is a cross-section of the plunging mandrel. Fig. 5 is a horizontal section on line *z z* in Fig. 3.

A is the main frame.

B is a standard.

C is a shaft journaled at one end in the frame A, and near the other end in the standard B. It is provided with the live-pulley E, loose pulley F, fly-wheel G, and pinion H.

I is another shaft journaled vertically above the shaft C, and in the same manner. It bears a gear-wheel, J, and pinion K, connected together and sleeved upon the shaft I.

L is a clutch operated by a lever, M.

N is another shaft journaled vertically above the shafts C and I. It is journaled at three places in bearings *a b c*. The bearing *a* is formed at the upper end of the standard B. The bearing *b* is formed in the upper part of the standard A', which forms an integral part of the frame A, and the bearing *c* is formed at the upper end of the end plate, O, which latter forms a detachable and adjustable part of the frame A A'. The bearing *a* is of the usual description, but the bearings *b* and *c* are inverted bearings—that is, their caps are at the under side of the shaft N.

P is a large gear-wheel keyed upon the shaft

N and intermeshing with the pinion K. The shaft N has formed upon it, between the bearings *b* and *c*, the crank *e*, which is journaled in a box-bearing, *d*.

R is the plunging mandrel. It is of a rectangular form with vertical sides, and is provided through its body with a lateral opening or slot, *f*, in which the bearing *d* is seated and adapted to slide sidewise to and fro. The lower face of this plunging mandrel is provided with transverse undercut mortises *g h*, in which the die-stocks *i* and *j* are secured in the usual way.

The upper extension, A', of the frame is provided with vertical flanges *k k*, and the end plate, O, is provided with corresponding flanges, *l l*.

Q Q are guide-plates horizontally grooved upon their outer faces and held in vertical position upon opposite sides of the mandrel-plunger by bolts *o o*, which pass through said grooves and adjustably connect the end plate, O, with the frame A'. Set-screws *m m*, passing through the flanges *k l*, bear against the guide-plates Q Q, and allow of the adjustment of the latter from or to the sides of the plunging mandrel. The end plate, O, is provided upon its lower end with an offset or flange, *p*, which engages with a shoulder, *q*, upon the frame A, firmly securing it thereby against any upward thrust.

r are bolts securing the plate O near its lower end to the frame A, without, however, interfering with a limited adjustability of said plate from or to the side of the plunger-mandrel by means of the bolts *o*.

S is a bed-block firmly seated upon or within the frame A, in any convenient manner.

t are flanges projecting upwardly from the frame A, and embracing the bed-block upon two opposite sides.

u are set-screws bearing against the bed-block S upon three sides.

v are shims interposed between one side of the bed-block and the frame A.

The bed-block S is provided upon its top face with lateral undercut mortises *w w*, in which the die-stocks *n* are secured in the usual way.

The top and bottom dies (not shown in the

drawings) are secured in the usual manner to the die-stocks, which have undercut mortises for this purpose.

The operation of the machine will be easily understood from the foregoing description. As the required action of the mandrel is obtained by its engagement upon the eccentric portion *e* of the shaft, which lifts it up and forces it down when in operation, it will be seen that the upward thrust exerted in forging is resisted by two bearings, *b* and *c*, which, owing to their inverted construction and connection with the frame, can do so to more advantage than in similar machines which have but one bearing to resist the thrust.

As perfect adjustability of all the parts, without sacrifice of strength, is a great desideratum in machines of these kinds, it will be seen that the peculiar construction and arrangement of the end plate, *O*, forms an important factor in the construction of my machine. Another advantage I get by the construction of my machine is that by doing away with the blow of the plunger or hammer with which forging-machines of that kind act, and substituting pressure therefor, I am enabled to use dies made of chilled iron, which are much cheaper than those heretofore used, which are of cast-steel, so as to withstand a heavy blow from the hammer. Another advantage is that I am thereby enabled to combine in my machine both the forging-dies and trimming-dies, obviating thereby much unnecessary handling. For forging, the dies approach about one-sixteenth of an inch, and this distance can be easily changed within small limits, if desired, by using shims to raise or lower the box in the plunging mandrel.

I deem the peculiar construction of the shaft

N, running the whole length of the machine, and having a crank, *e*, formed thereon, as an important feature of my invention, as it allows of a mandrel of great width being used, and yet admits of the support of the crank *e* at both ends. This double support for the crank *e* admits of the crank being made of great length, affording a large bearing-surface, so that there is no danger of the lubricant being squeezed out, as is the case sometimes under the enormous pressure exerted in these machines when the bearing-surface is small, as in those machines where the crank is necessarily short, owing to its not having a support at each end.

I am aware that punching-machines have been provided with an eccentric of larger size than the shaft, and supported by two bearings, and make no claim to this construction, as this necessitates a much more bulky arrangement, because the eccentric cannot pass through the mandrel.

What I claim as my invention is—

1. In a forging-machine, and in combination with the plunging mandrel and main frame thereof, a detachable end plate forming an end bearing for the main shaft, and provided with an offset upon its lower end engaging upon an offset on the main frame, substantially as and for the purposes described.

2. In a forging-machine, the combination of the plunging mandrel *R*, frame *A*, and end plate, *O*, with the guide-plates *Q*, bolts *o*, and set-screws *m*, constructed and arranged substantially as and for the purposes described.

RALPH H. BEACH.

Witnesses:

H. S. SPRAGUE,
C. J. HUNT.