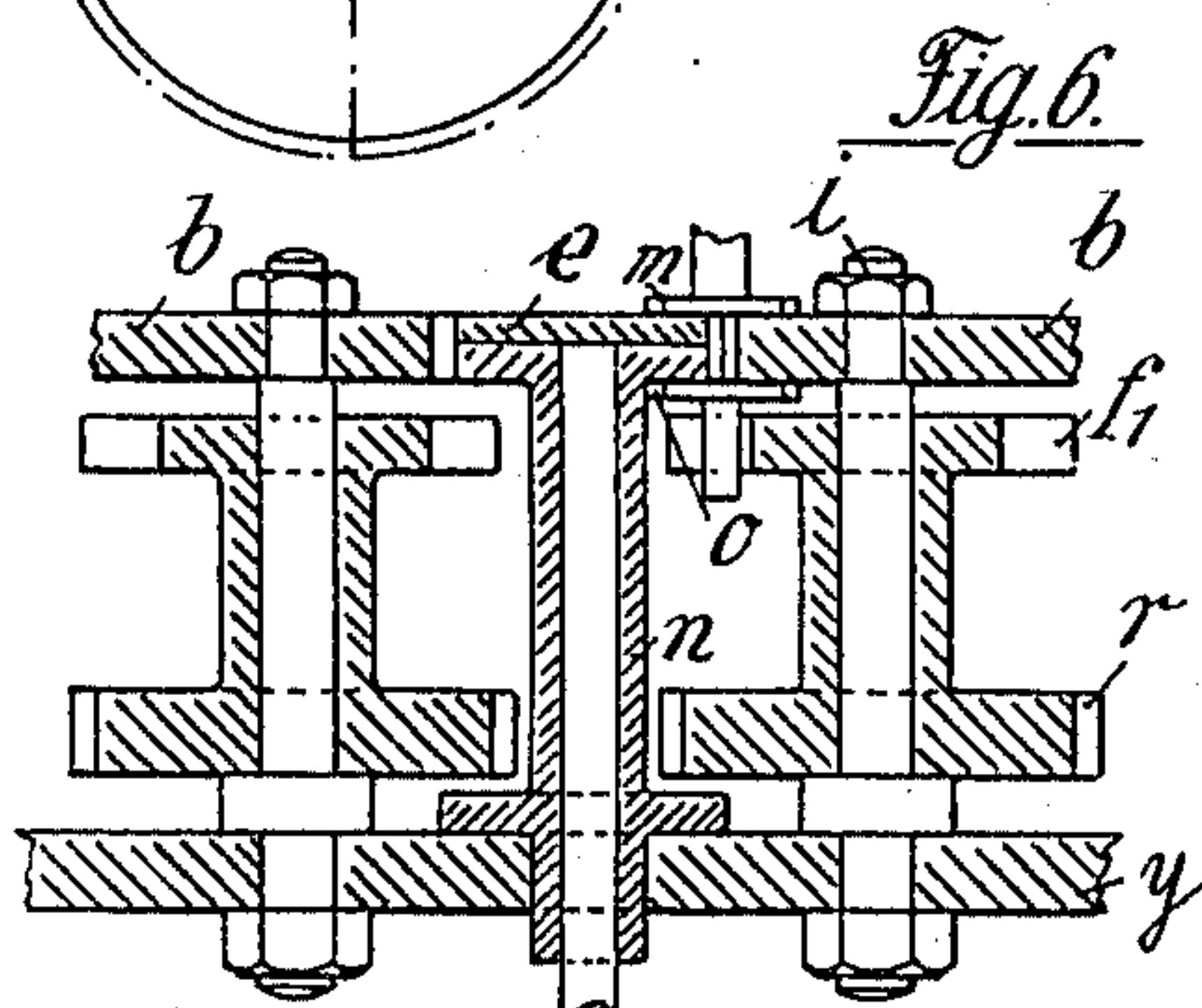
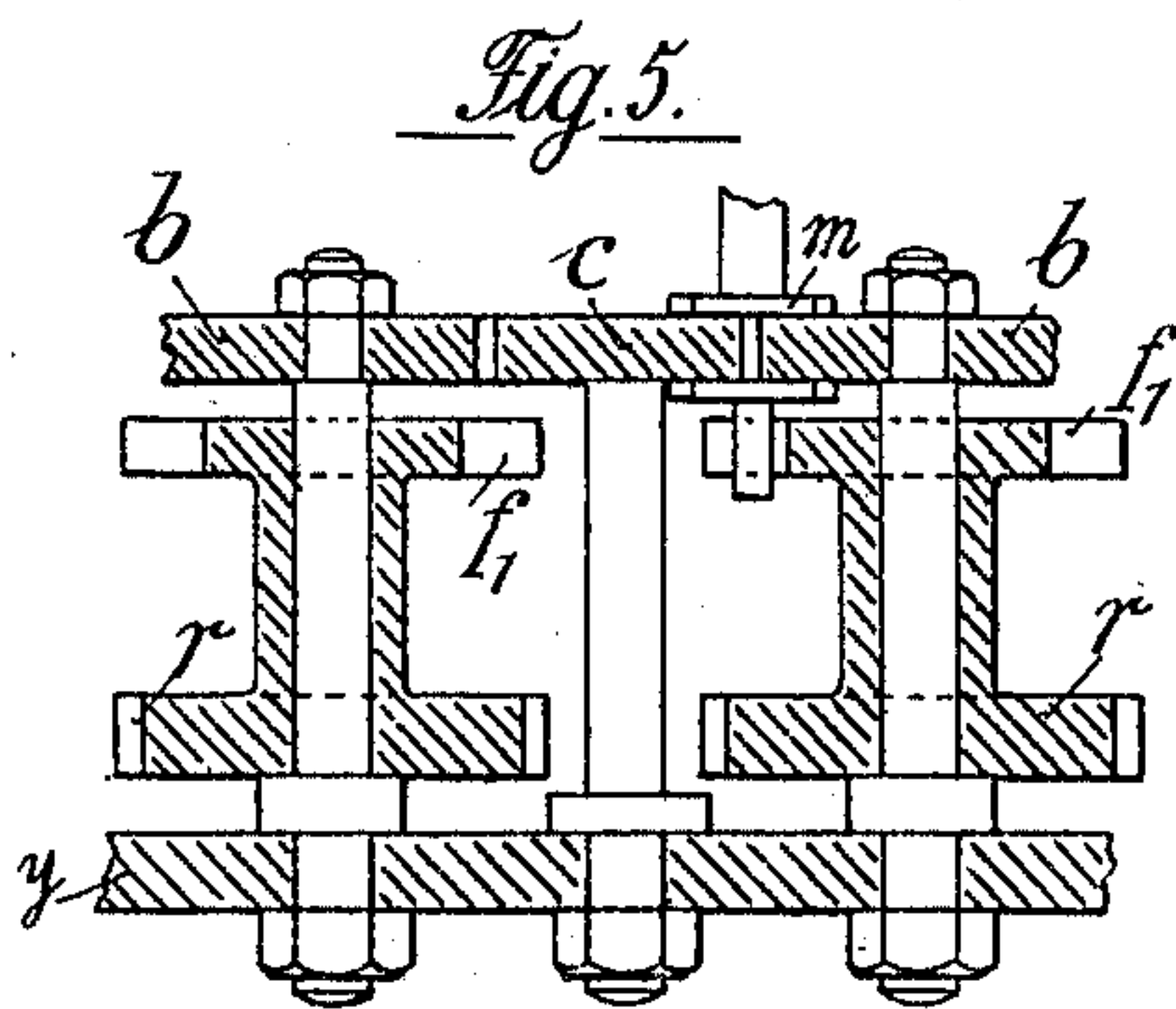
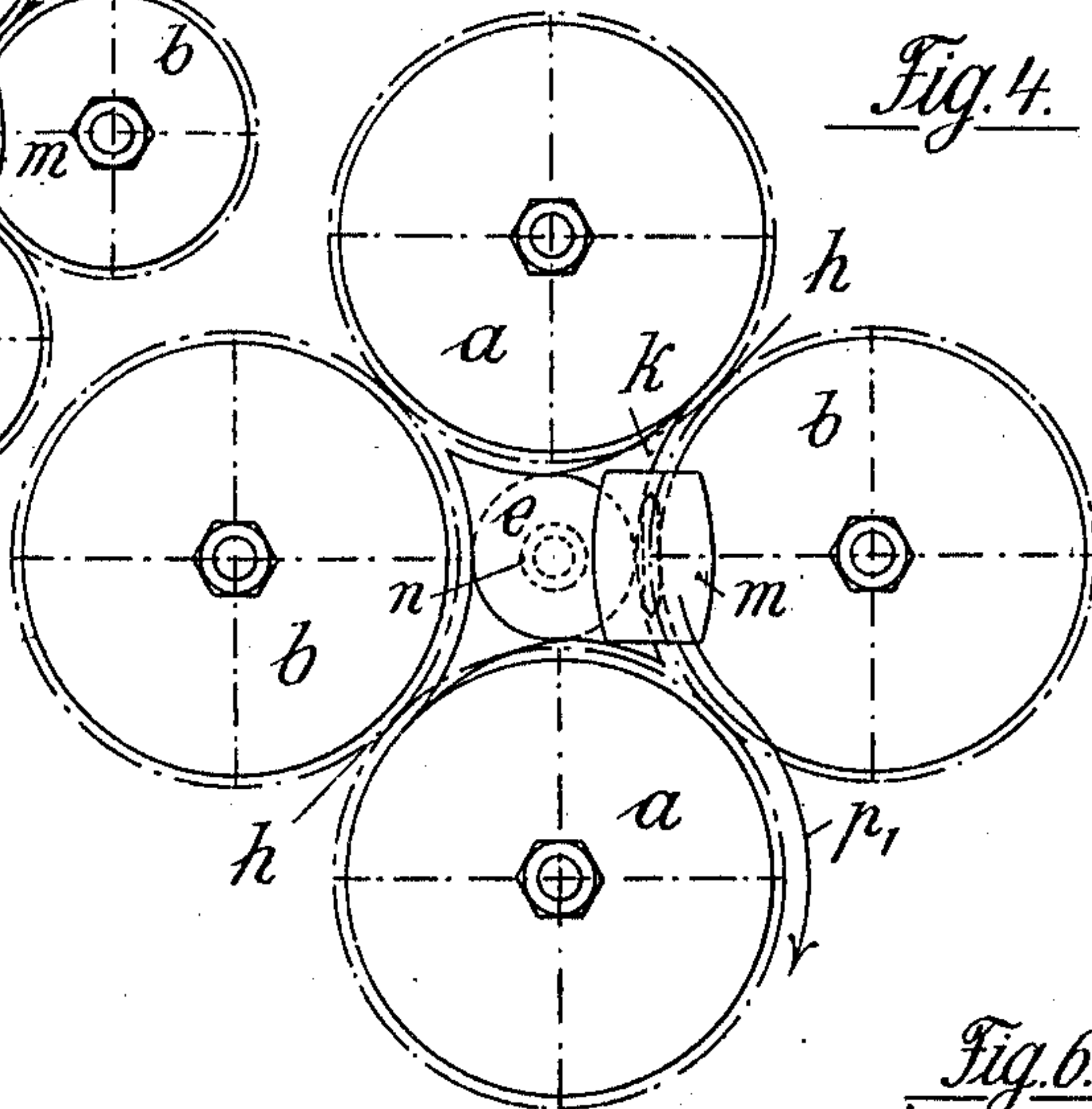
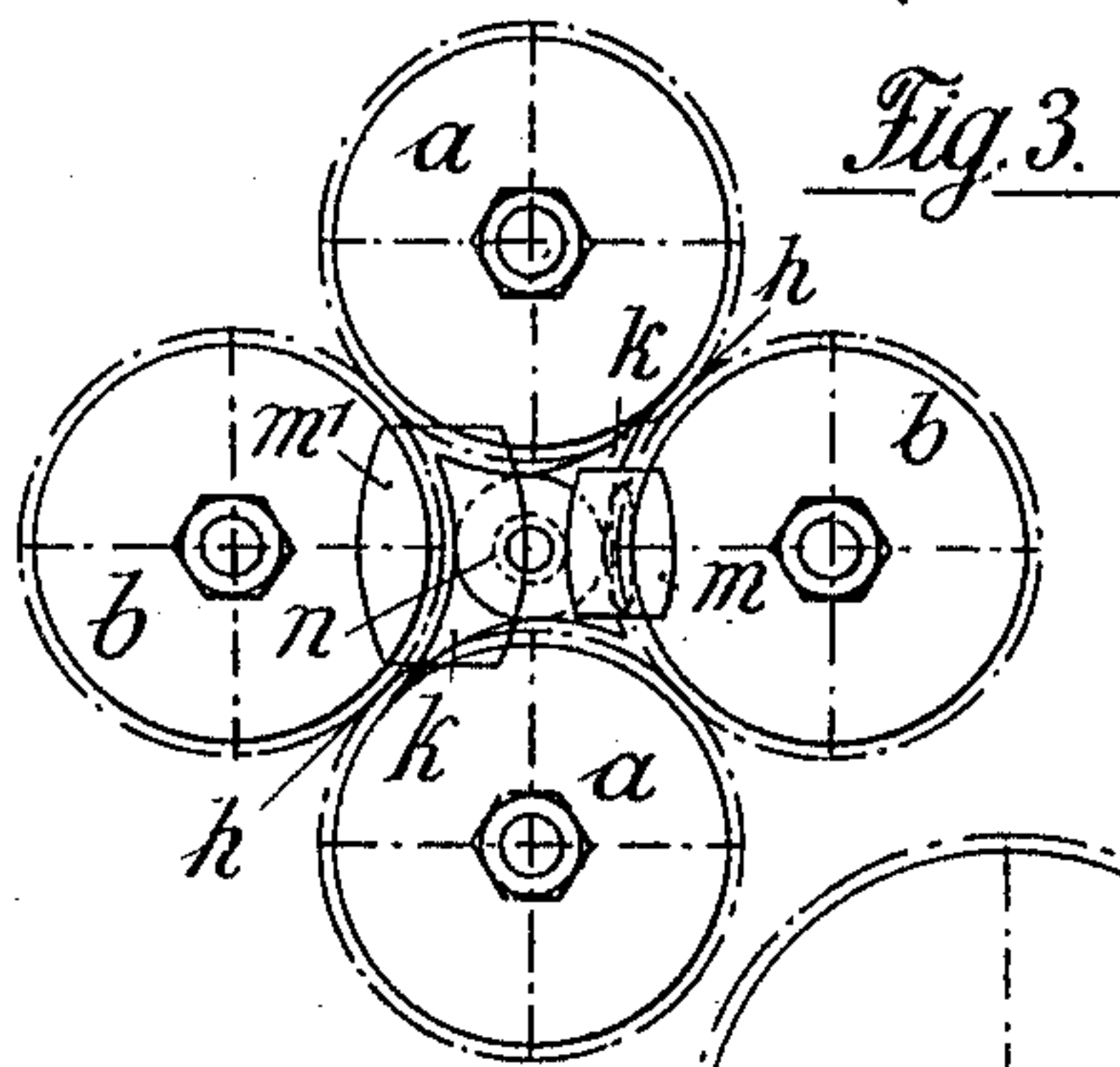
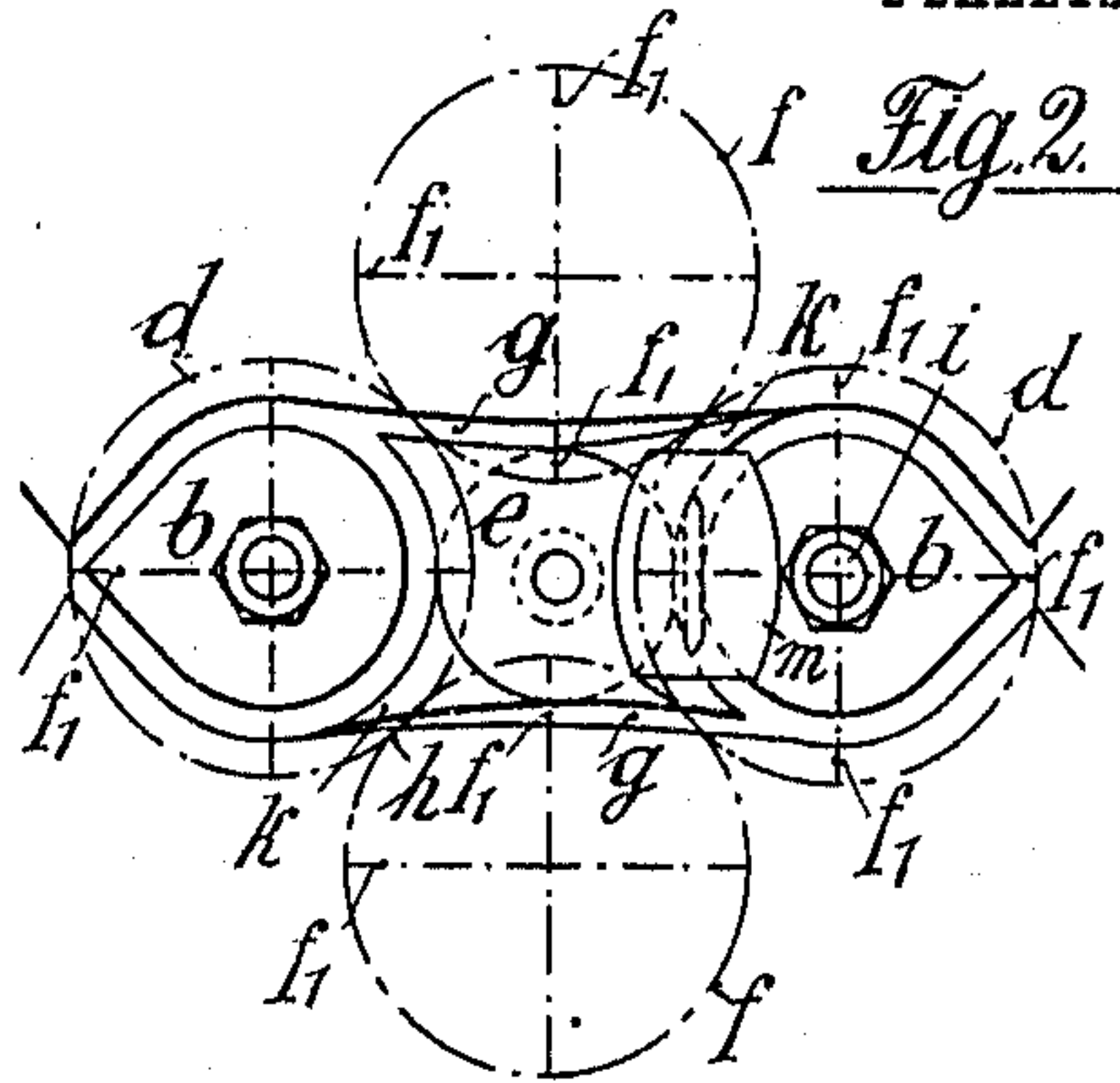
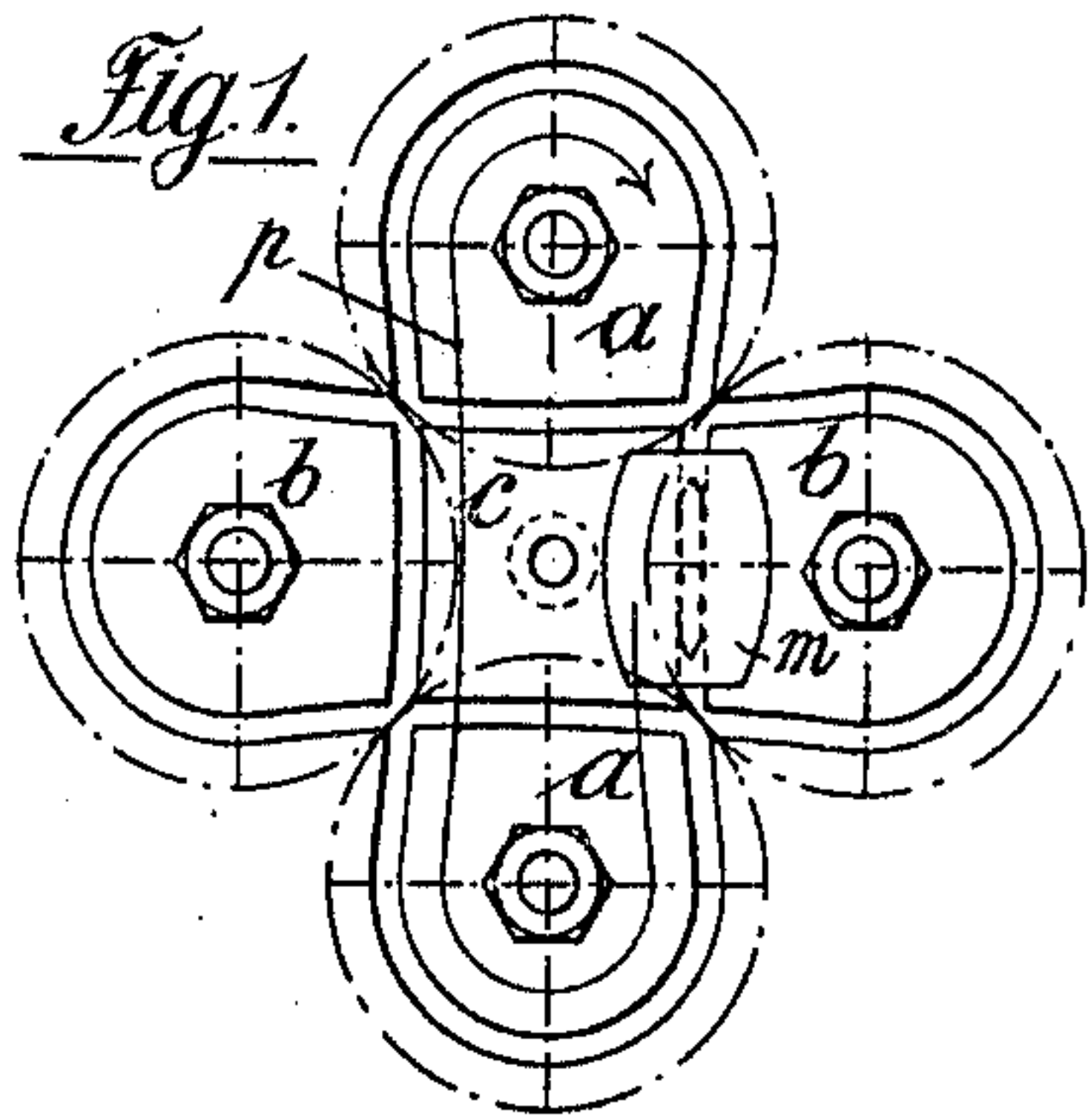


F. A. SCHMIDT.  
BRAIDING AND PLAITING MACHINE.  
APPLICATION FILED SEPT. 24, 1908.

952,950.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.



Witnesses:

*Otto König*  
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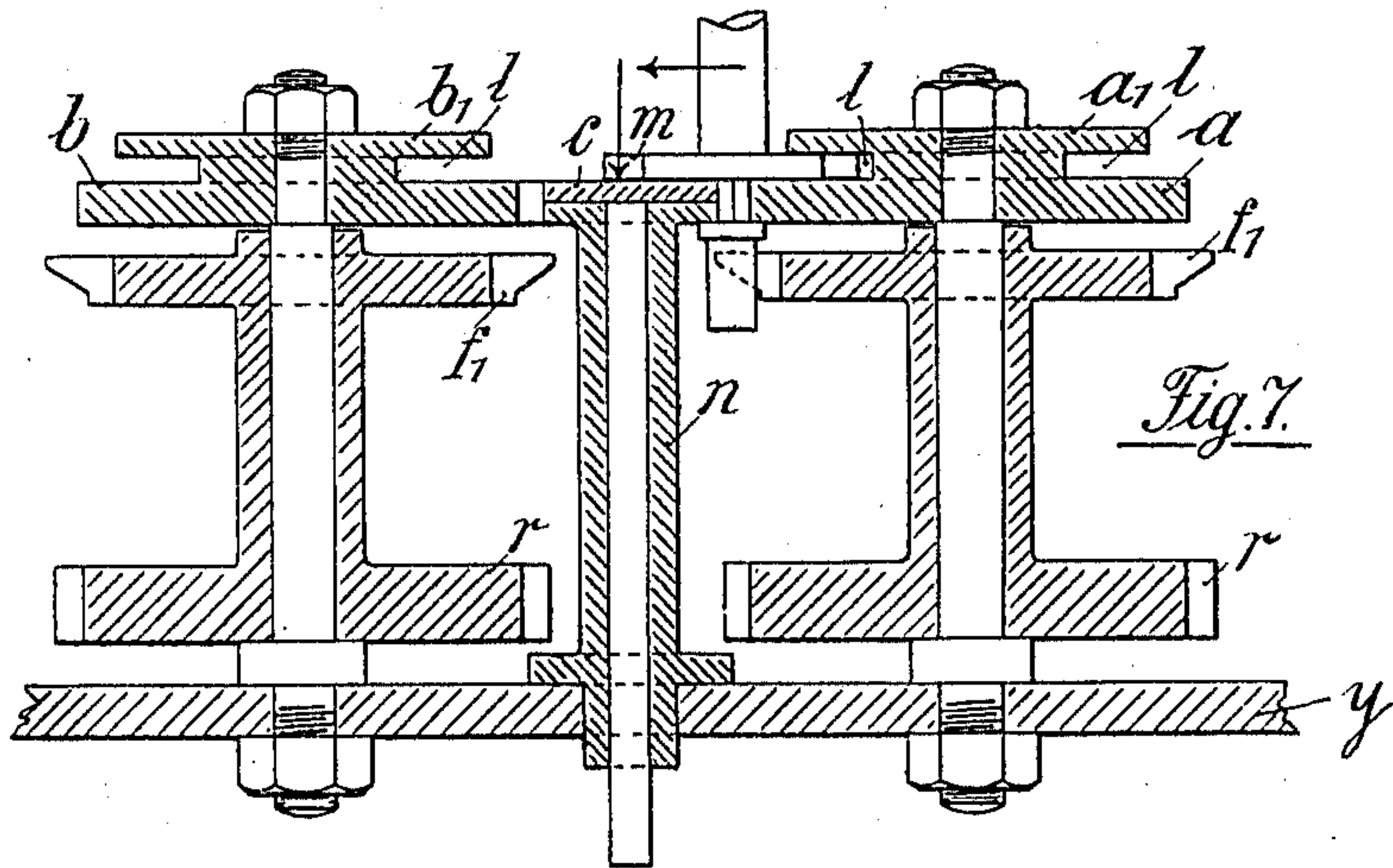
*Friedrich August Schmidt*

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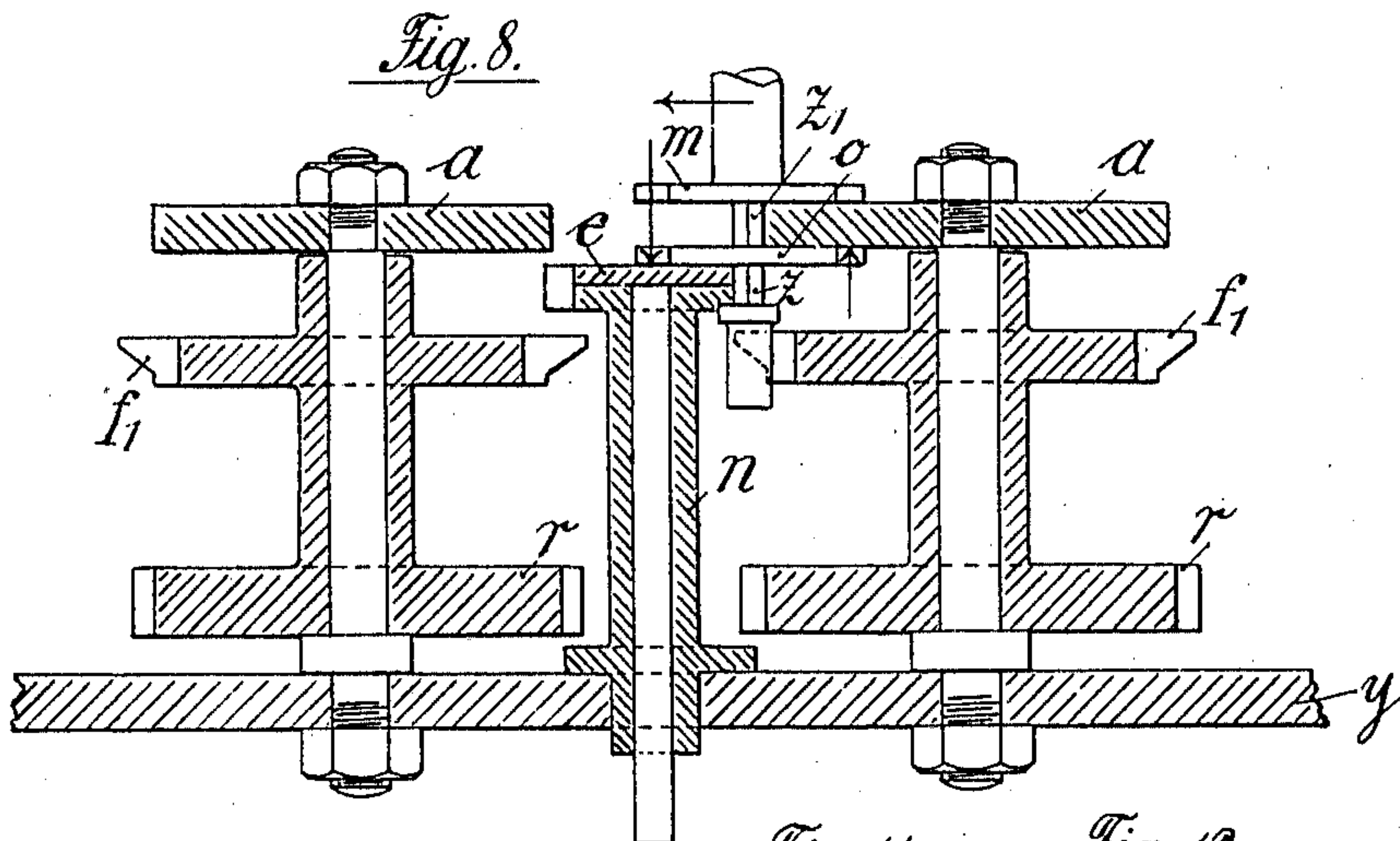
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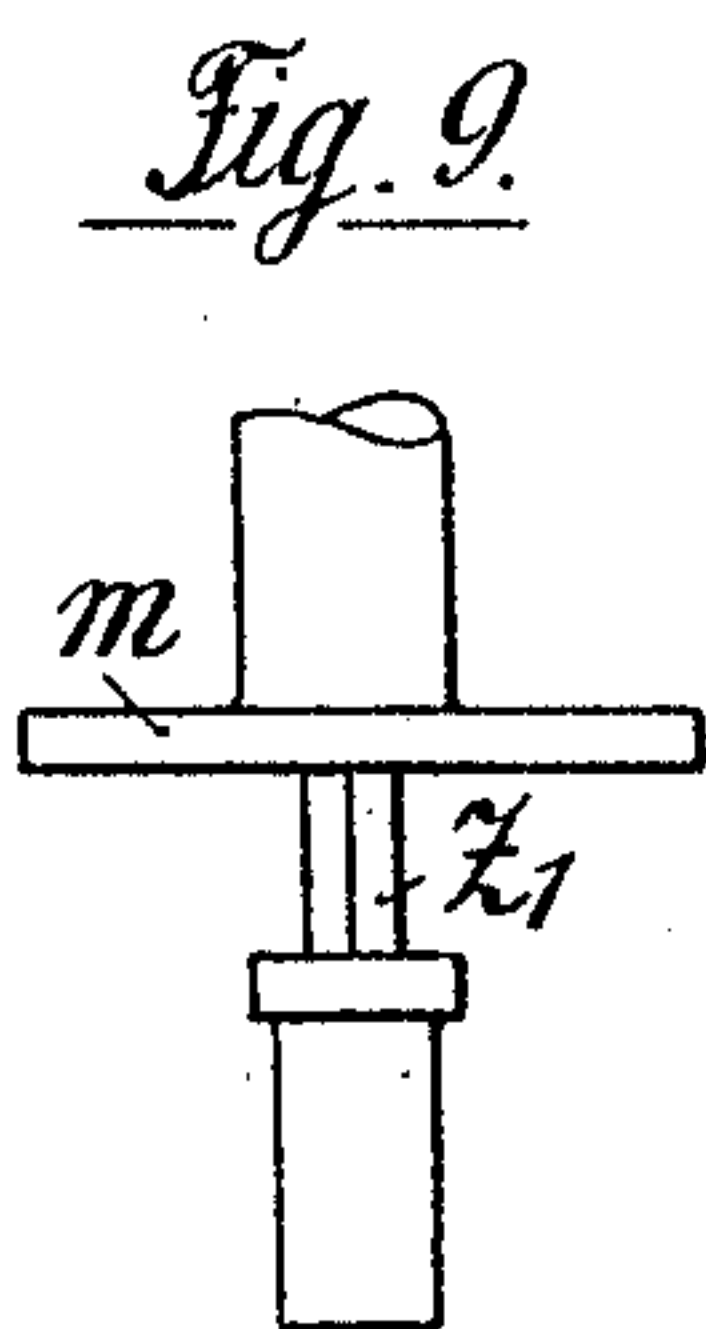
2 SHEETS—SHEET 2.



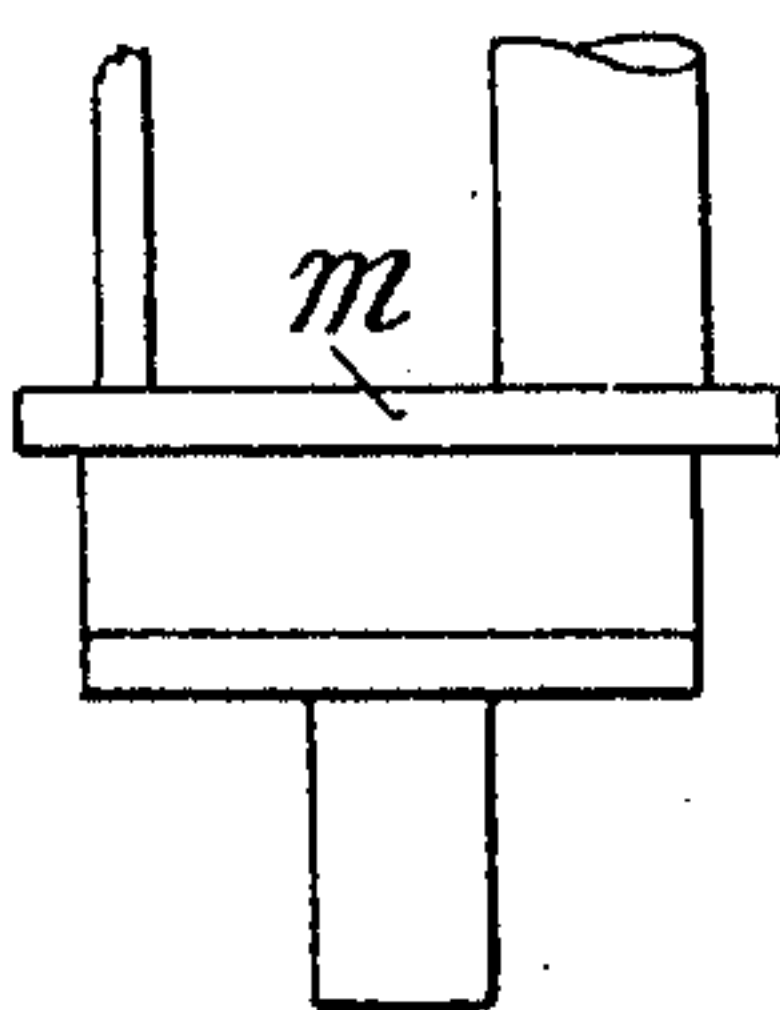
*Fig. 7.*



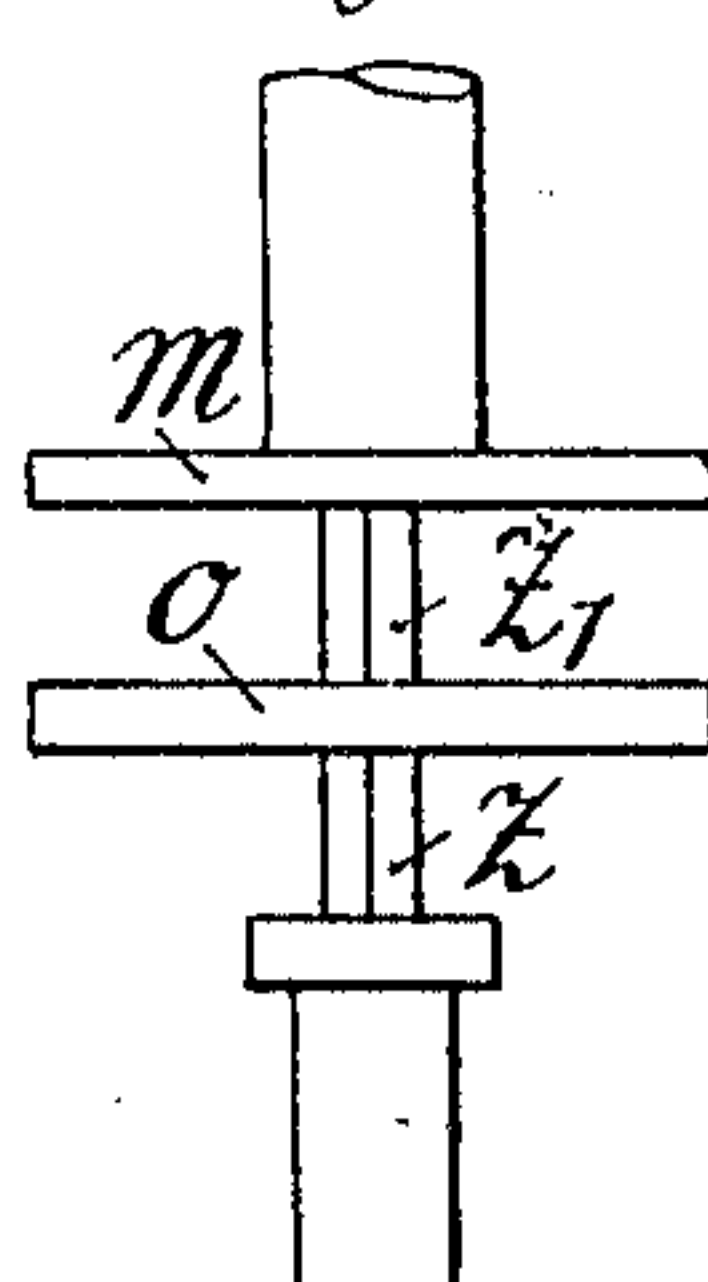
*Fig. 8.*



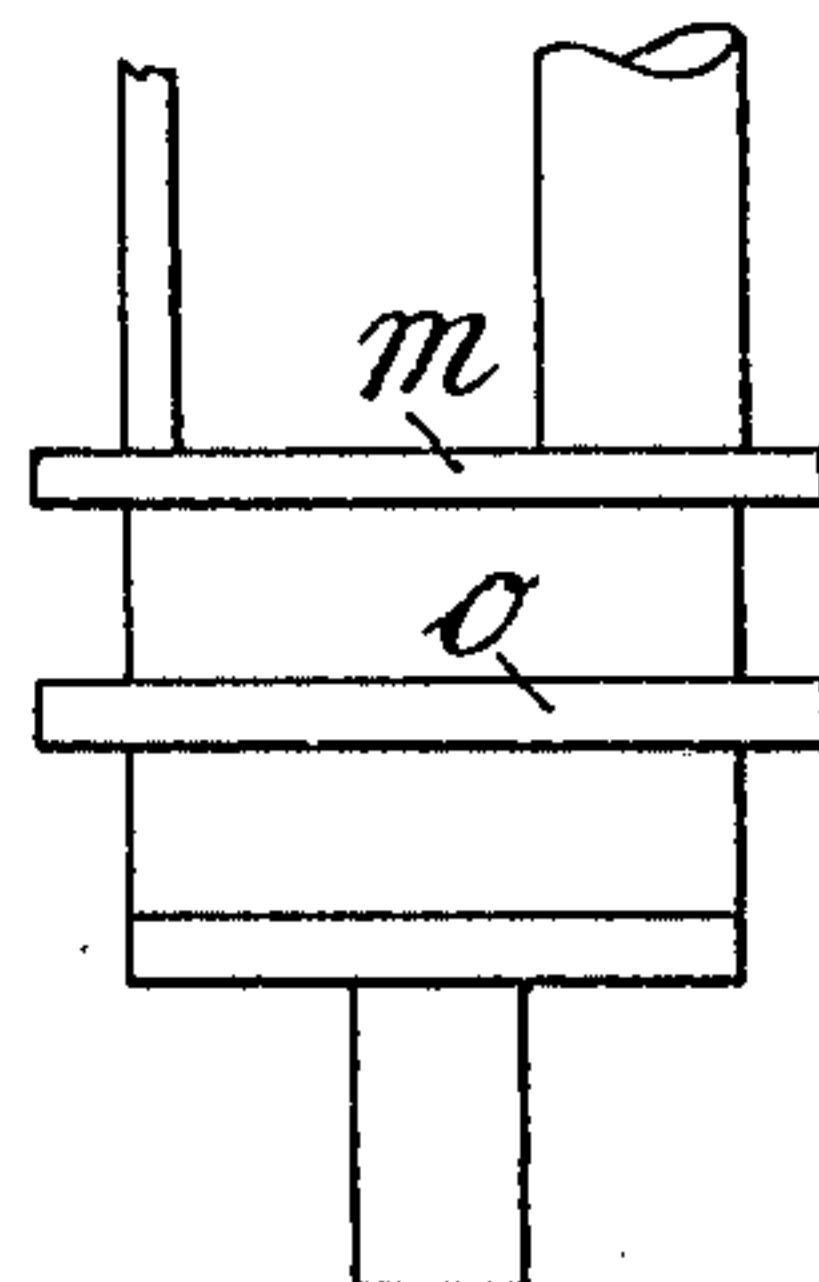
*Fig. 9.*



*Fig. 10.*



*Fig. 11.*



*Fig. 12.*

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# UNITED STATES PATENT OFFICE.

FRIEDRICH AUGUST SCHMIDT, OF BARMEN, GERMANY.

BRAIDING AND PLAITING MACHINE.

952,950.

Specification of Letters Patent.

Patented Mar. 22, 1910.

Application filed September 24, 1908. Serial No. 454,647.

*To all whom it may concern:*

Be it known that I, FRIEDRICH AUGUST SCHMIDT, subject of the German Emperor, and residing at Barmen, Germany, have invented certain new and useful Improvements in Braiding and Plaiting Machines, of which the following is a specification.

The present invention relates to braiding and plaiting machines having double-acting switches or double-acting switches and intermediate plates, and an important object is to provide improved guiding means for the bobbins.

In order that the invention may be clearly understood reference will be made to the accompanying drawing in which several embodiments are represented by way of example and in which:

Figures 1 to 4 are diagrammatic plan views of known arrangements of partial trains, and Figs. 5 and 6 are vertical sections through the partial trains shown in Figs. 1 and 2 respectively. Figs. 7 and 8 are vertical sectional elevations showing the invention applied to such partial trains, whereas Figs. 9 to 12 are elevations of feet of bobbin carriers provided with foot-plates according to the invention.

As is well-known, double-acting switches as well as intermediate plates are always arranged in braiding and plaiting machines between four driving wheels which form a closed square and mesh one with another. As a rule the intermediate plates are arranged where it is wished to have two partial trains crossing one another, each partial train comprising two oppositely disposed heads or plates *a a*, *b b* and the common intermediate plate *c*, as clearly indicated in Fig. 1.

When double-acting switches are used the bobbin carrier may be caused to run in two ways: either only two driving wheels with plates *b b* are provided, so that, in consequence of the double-acting switch *e* (Fig. 2) being moved correspondingly by a pattern gear, the bobbin carrier can turn around the plate *b b* it is on, and also run from one plate to the other, in which latter case the other drivers *f<sup>1</sup> f<sup>1</sup>* of the wheel *r* guide the bobbin carrier by way of the track *g* of the double-acting switch *e* (see Fig. 2). Or if all the four driving wheels are provided with plates as shown in Fig. 4, the bobbin carrier can not only run according to the manner indicated by the arrow *p* in Fig. 1, but can also be guided by way of plates *a b*

arranged beside one another, as indicated by the arrow *p<sup>1</sup>* in Fig. 4. Now when such double-acting switch guide-tracks are constructed the following results which are represented in Figs. 2 to 6 are obtained. As clearly shown in Fig. 2, the track of the bobbin is within the pitch circles *d d*, *f f* of the wheels *r*, so that the plates *b* are considerably smaller than the pitch circles. The purpose of this constructional form is to divide the space uniformly between the pillar *i* and the bushing *n* for the passage of the foot-plate *o* of the bobbin carrier. The two points *k* of the double-acting switch *e* are also situated within the pitch circle *d* in this constructional form of the bobbin-tracks.

When the plates are arranged as shown in Figs. 3 and 4 the points *k* of the double-acting switch must be at the places *k* where the pitch circles contact, as will be readily understood from the drawing. From this it follows that the entire path of the bobbin carrier must be on the pitch circle in order that the bobbin may run correctly and free from jerks. This displacement of the path of the bobbin carrier farther to the outside into the pitch circle has the serious disadvantage that the diameter of the double-acting switch becomes so small that the foot-plate *m<sup>1</sup>* of the bobbin carrier can no longer pass the bushing *n* of the double-acting switch, as is represented in Fig. 3, or the foot-plate *m* of the bobbin carrier becomes too small in proportion to the other parts of the bobbin carrier, if the foot-plate is made suitable for the passage, as indicated at the right-hand of Fig. 3. If it is wished to maintain the ordinary proportions of the double-acting switch and the foot-plate of the bobbin carrier however, the diameter of the pitch circles becomes considerably greater, as clearly shown in Fig. 4. When only a few such double-acting switch tracks are arranged, the larger diameters of the driving wheels *r* have no great influence on the diameter of the entire machine. But as soon as it is wished to make tracks of this kind everywhere, for example in machines having two or more concentric rows of heads or plates, the diameter of the machine becomes exceedingly large. Now an important object of the present invention is to avoid this, and the invention substantially consists in arranging the double-acting switches under the foot-plates of the bobbin



carriers, and not between them as was usual heretofore, so that in the new arrangement only the top faces of the double-acting switches serve for guiding the foot of the bobbin carrier. Now owing to no foot-plate of the bobbin carrier engaging under the double-acting switch, it is possible to arrange the bobbin carrier farther toward the center of the double-acting switch or to make the latter smaller, without diminishing the otherwise usual dimensions of the bobbin carriers. Also when double-acting switches and intermediate plates are arranged alternately in one and the same machine, the intermediate plates must engage under the foot of the bobbin, because the intermediate plates, owing to the simultaneous employment of double-acting switches, become smaller, since the heads or plates which surround the intermediate plates have become larger.

Referring to Figs. 7 and 8 showing forms according to the invention, the arrangement of the driving wheels  $r$ , and the attachment of the double-acting switches  $c$  and plates  $a, b$  to the base-plate  $y$  are the same as are generally customary. This will be readily understood when the new arrangements are compared with the old constructional forms of an intermediate plate  $c$  and double-acting switch  $e$  represented in Figs. 5 and 6. Now in the constructional forms according to the invention the bottom plate of the foot of the bobbin carrier can be partially or entirely removed, and for the purpose of securely guiding the foot of the bobbin carrier, which has now only one plate  $m$ , double heads or plates  $a^1, b^1$ , are employed, in the grooves  $l$  of which the foot-plate  $m$  of the bobbin carrier is guided, as clearly shown in Fig. 7. The same purpose is also obtained when the foot-plates  $m, o$  of the bobbin carrier and the head or plate  $a$  are left in their old form and when the double-acting switch  $e$  is arranged lower down under the lower foot-plate  $o$  of the bobbin carrier, as clearly shown in Fig. 8. When double-acting switches are arranged in such a manner, the bobbins are guided just as certainly as when the double-acting switches are arranged between the foot-plates, and the manner in which the bobbin carriers are guided is as follows: As the center of gravity of the bobbin carrier is fairly high above its foot, the bobbin carrier tends to tilt over to the outside in consequence of the centrifugal force imparted to it when it is driven. This tendency makes itself noticeable in the guiding of the bobbin carrier by the frictional pressure between the foot-plates coming from above onto the double-acting switch, whereas the pressure

at the plate is from below, as is indicated by vertical arrows in Figs. 7 and 8, the horizontal arrows indicating the direction of pull on the bobbin carriers.

The above described constructional forms of the invention are represented in Figs. 7 to 12. Fig. 7 is a section through an arrangement of double-acting switches  $c$  with double heads  $a$  and  $b$ , the foot of the bobbin carrier having only one plate  $m$ , whereas Fig. 8 is also a section of a double-acting switch  $c$  together with a foot of a bobbin carrier having two plates  $m$  and  $o$ , the double-acting switch being placed somewhat lower than that shown in Fig. 7. Figs. 9 and 10 are front and side elevations of a foot of a bobbin carrier having one plate  $m$ , whereas Figs. 11 and 12 are front and side elevations of a foot of a bobbin carrier having two plates  $m$  and  $o$ .

In the form shown in Fig. 7 the bottom part  $a$  of the head or plate and the double-acting switch  $e$  are in one and the same plane. The foot-plate  $m$  of the bobbin carrier projects into the groove  $l$  and is held by the upper part  $a^1$  of the plate. In the form shown in Fig. 8 the double-acting switch  $e$  is arranged under the lower plate  $m$  of an ordinary foot of a bobbin. The foot of the bobbin carrier preferably has in addition a second so-called heart  $z$ , which is known in itself, and is situated at the double-acting switch, whereas the other heart  $z^1$  is guided at the head.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a braiding and plaiting machine, the combination, with a base-plate and a double-acting switch mounted thereon, of heads or plates mounted on said base-plate laterally of said switch, and a bobbin carrier having one or more foot-plates, the latter contacting with a head or plate, and one of said foot-plates resting upon said double-acting switch, only the top side of the double-acting switch being contacted by a foot-plate of the bobbin.

2. In a braiding and plaiting machine, the combination, with a base-plate, and a double-acting switch mounted thereon, of heads or plates mounted on said base-plate laterally of said switch, and a bobbin carrier having two foot-plates, the latter engaging a head or plate, and only the bottom foot-plate resting on said double-acting switch.

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

FRIEDRICH AUGUST SCHMIDT.

Witnesses:

OTTO KÖNIG,

WILHELM BÖGERSHAUSEN.