

No. 865,234.

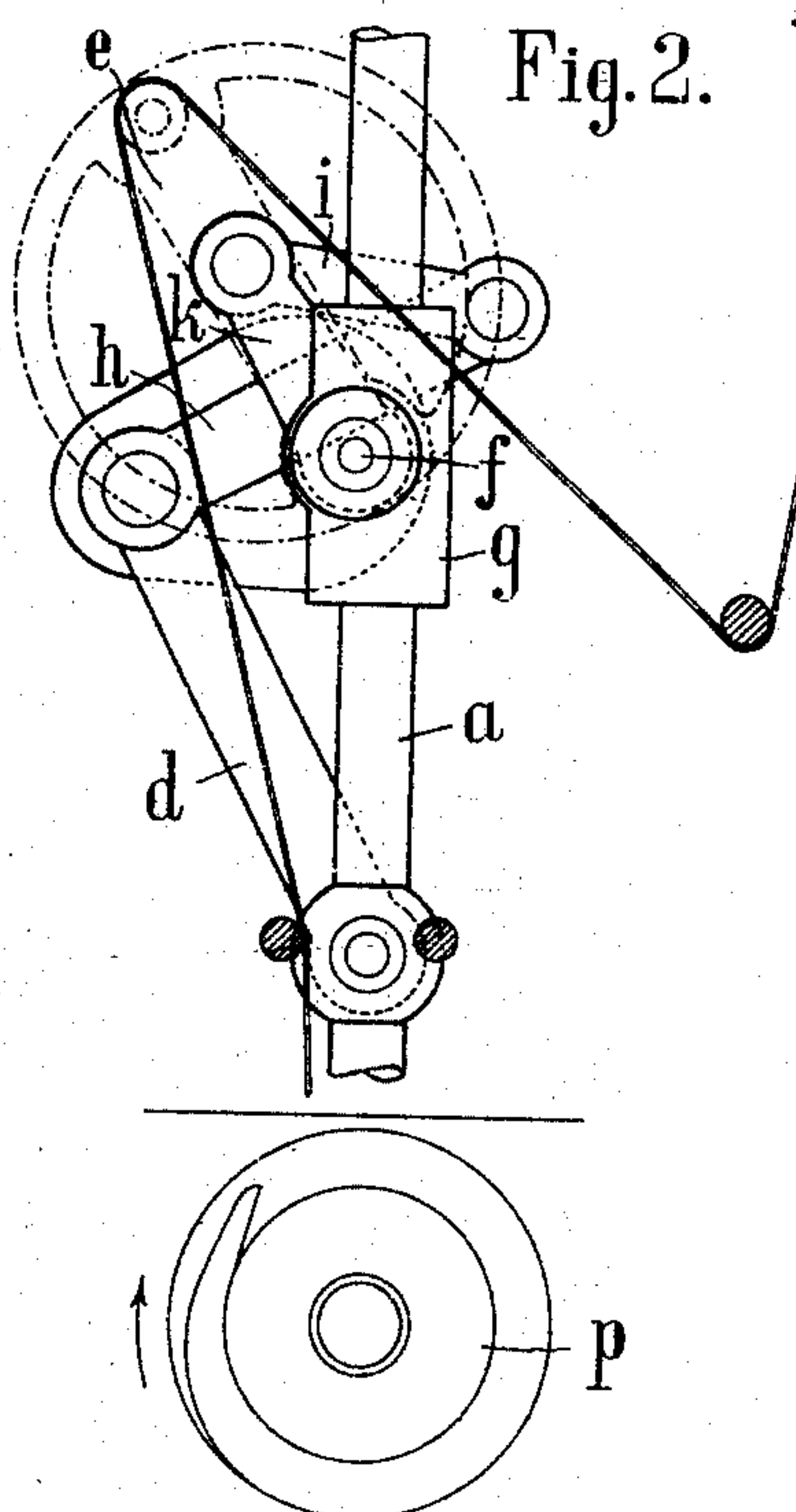
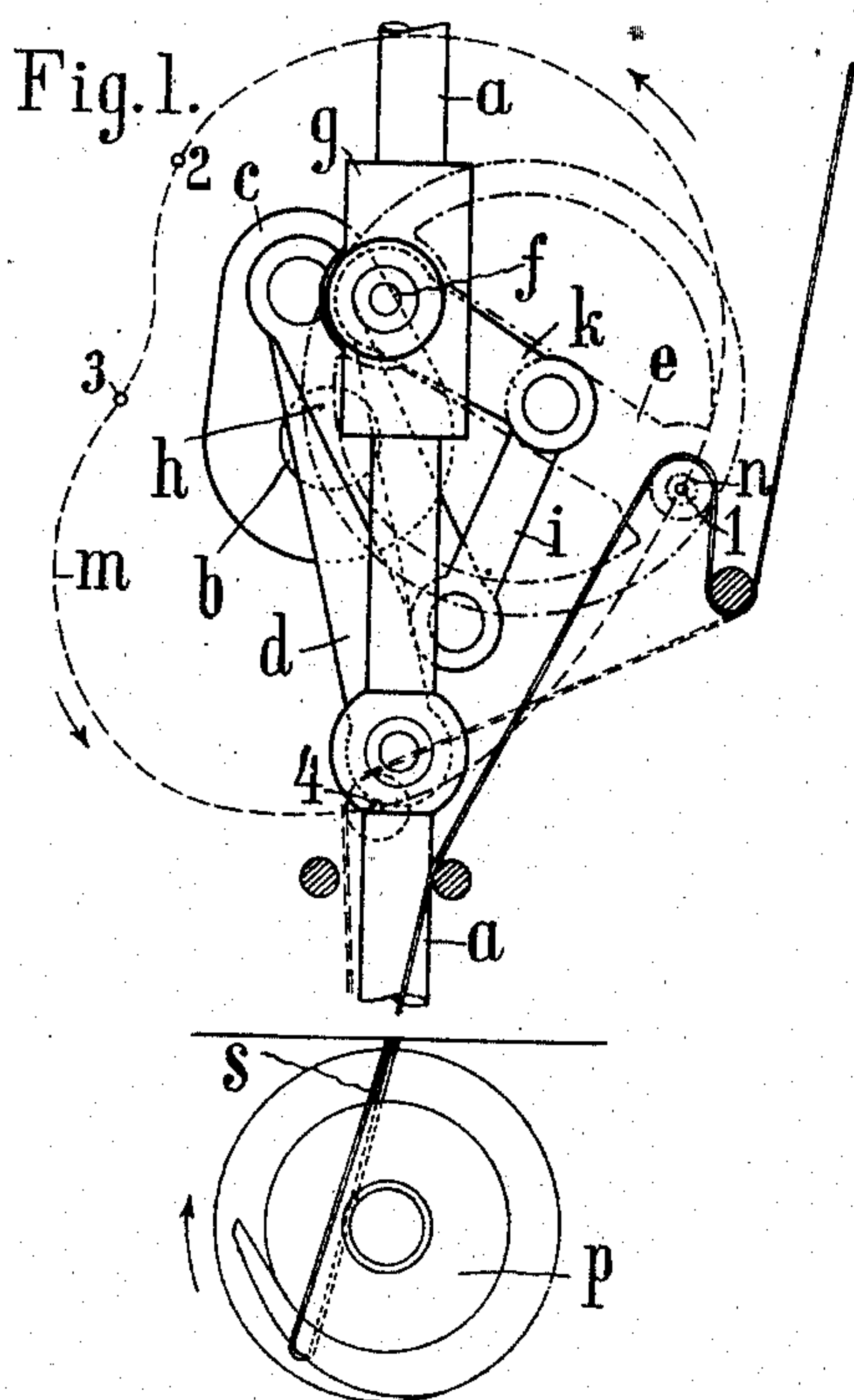
PATENTED SEPT. 3, 1907.

W. BÜSCHER.

THREAD TAKE-UP FOR SEWING MACHINES.

APPLICATION FILED APR. 13, 1906.

3 SHEETS—SHEET 1.



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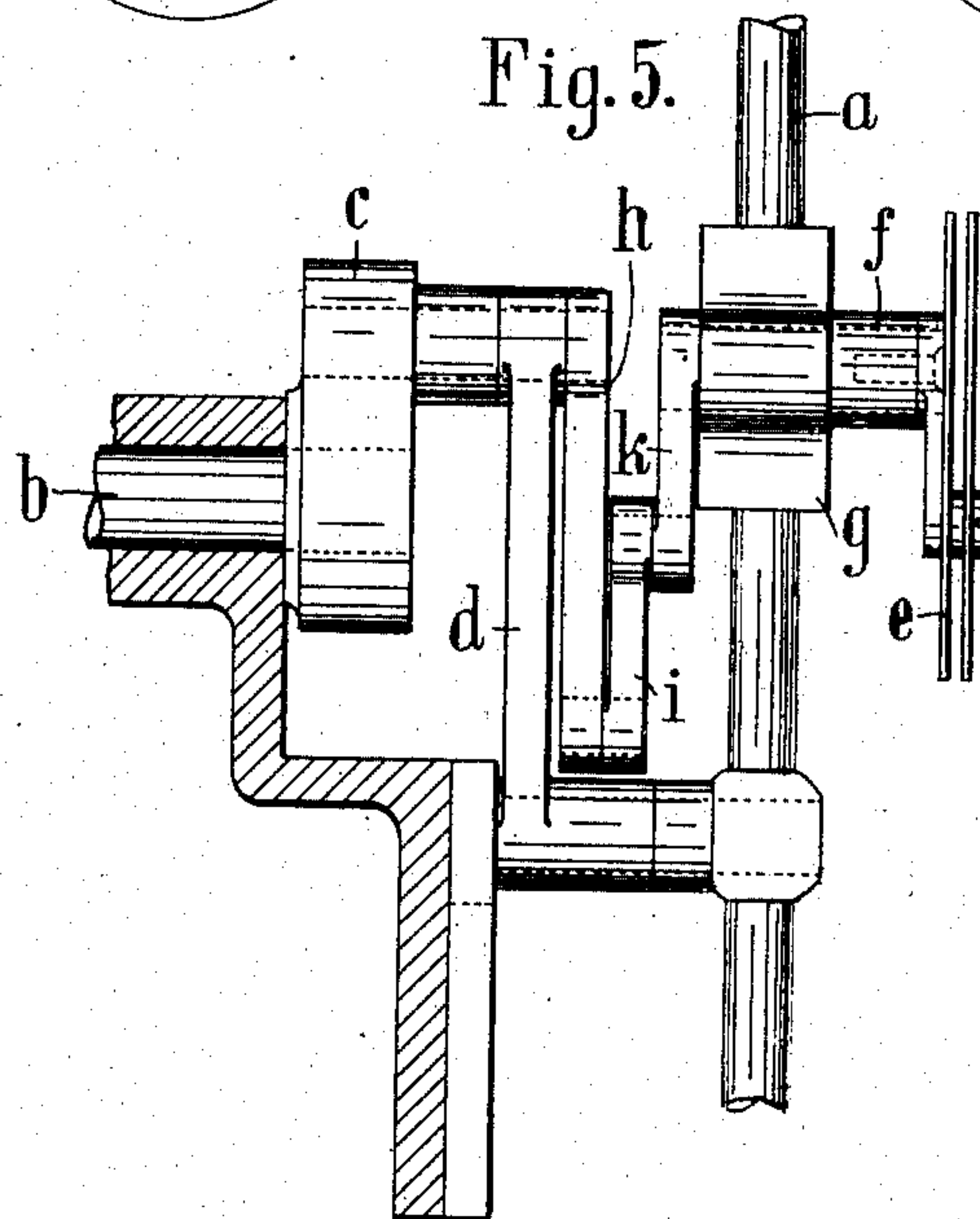
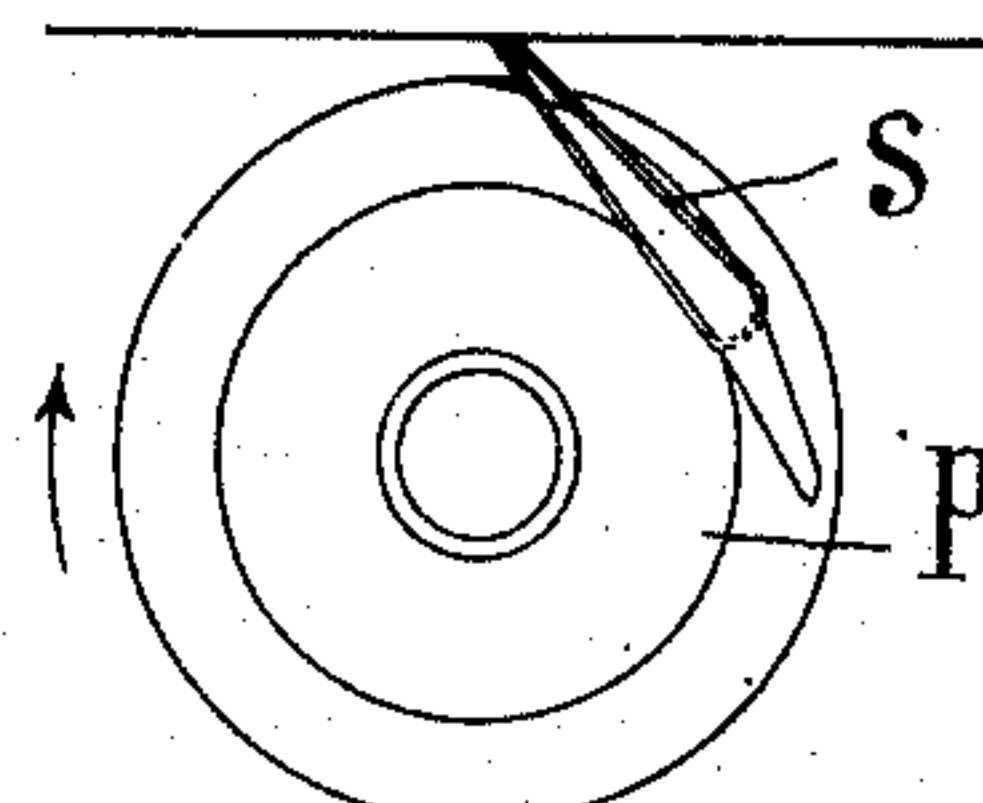
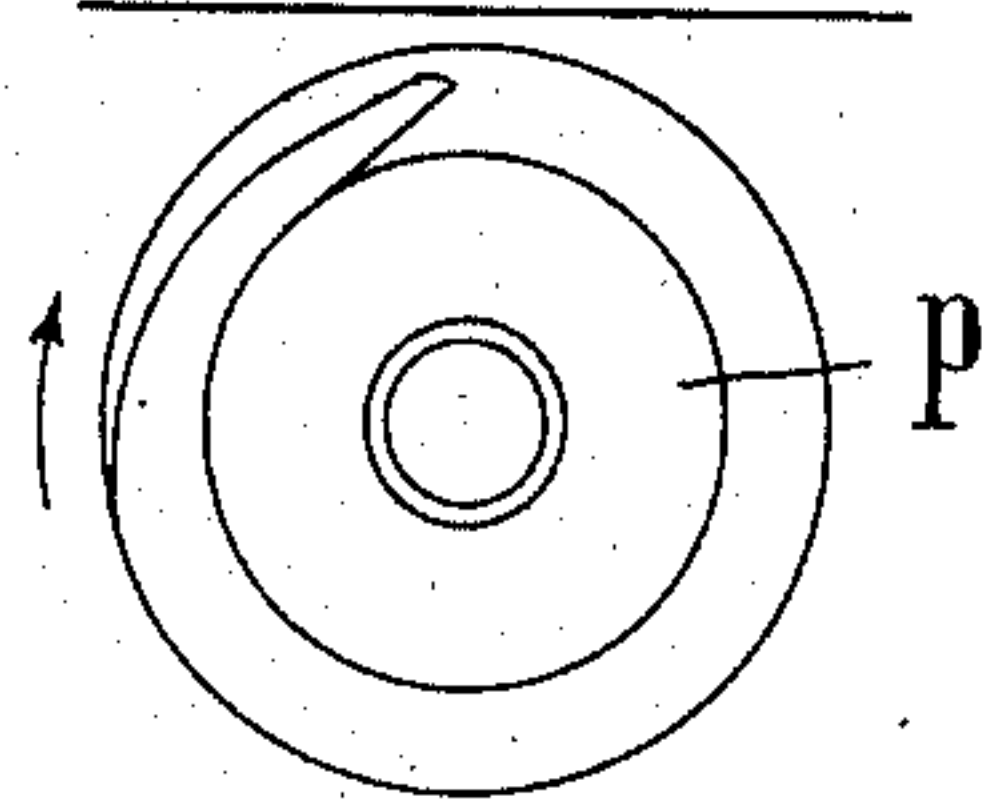
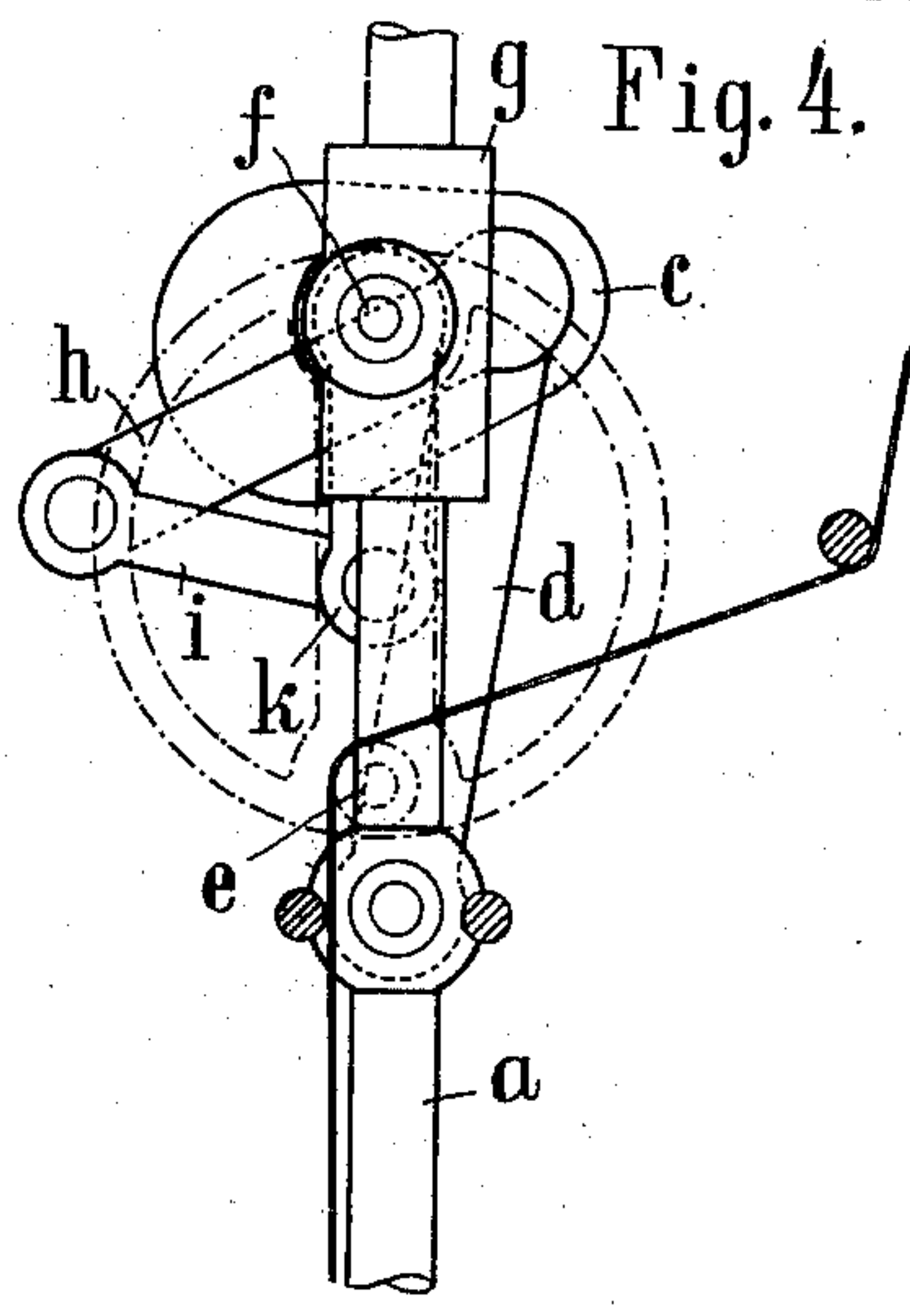
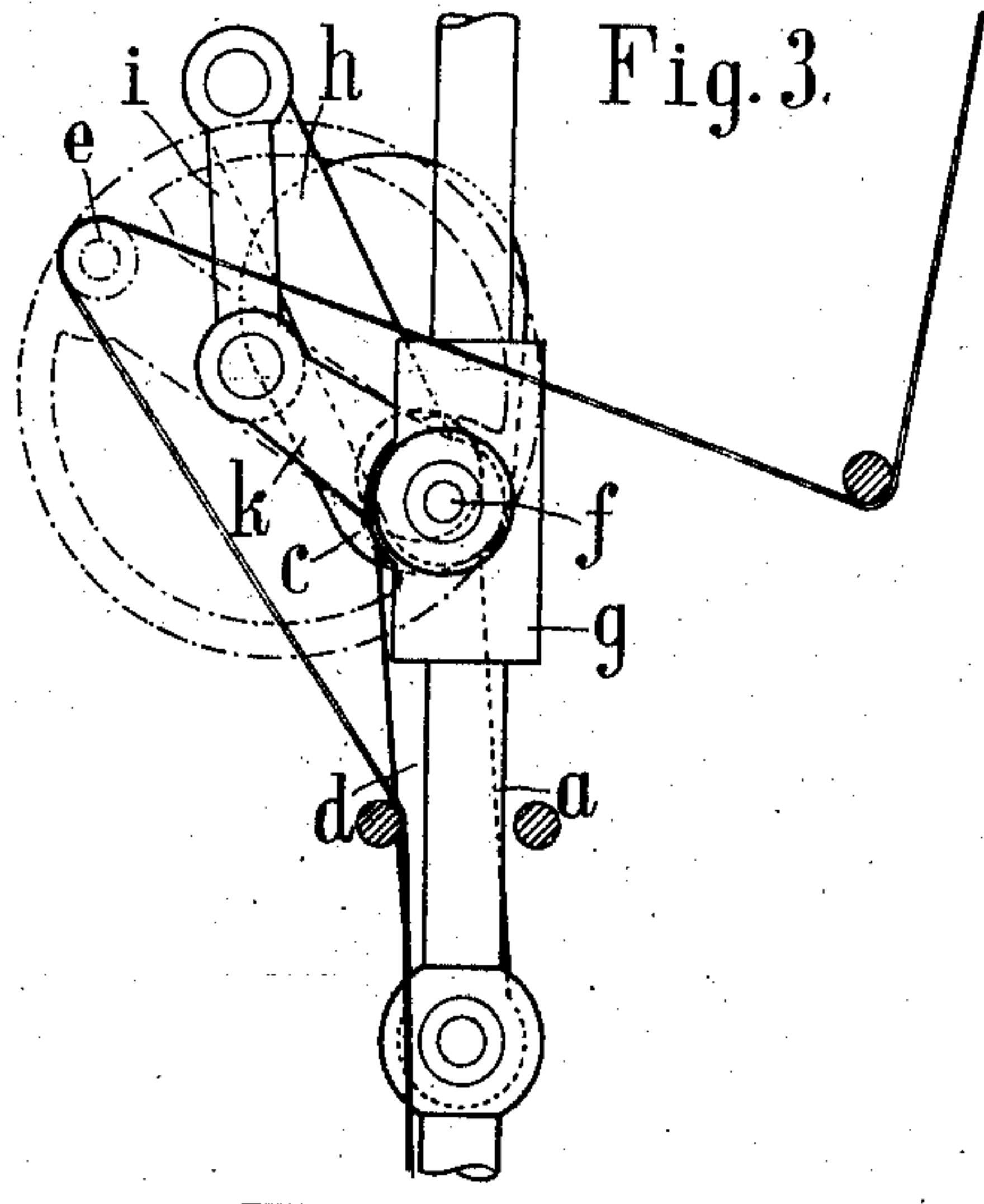
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3 SHEETS—SHEET 2.



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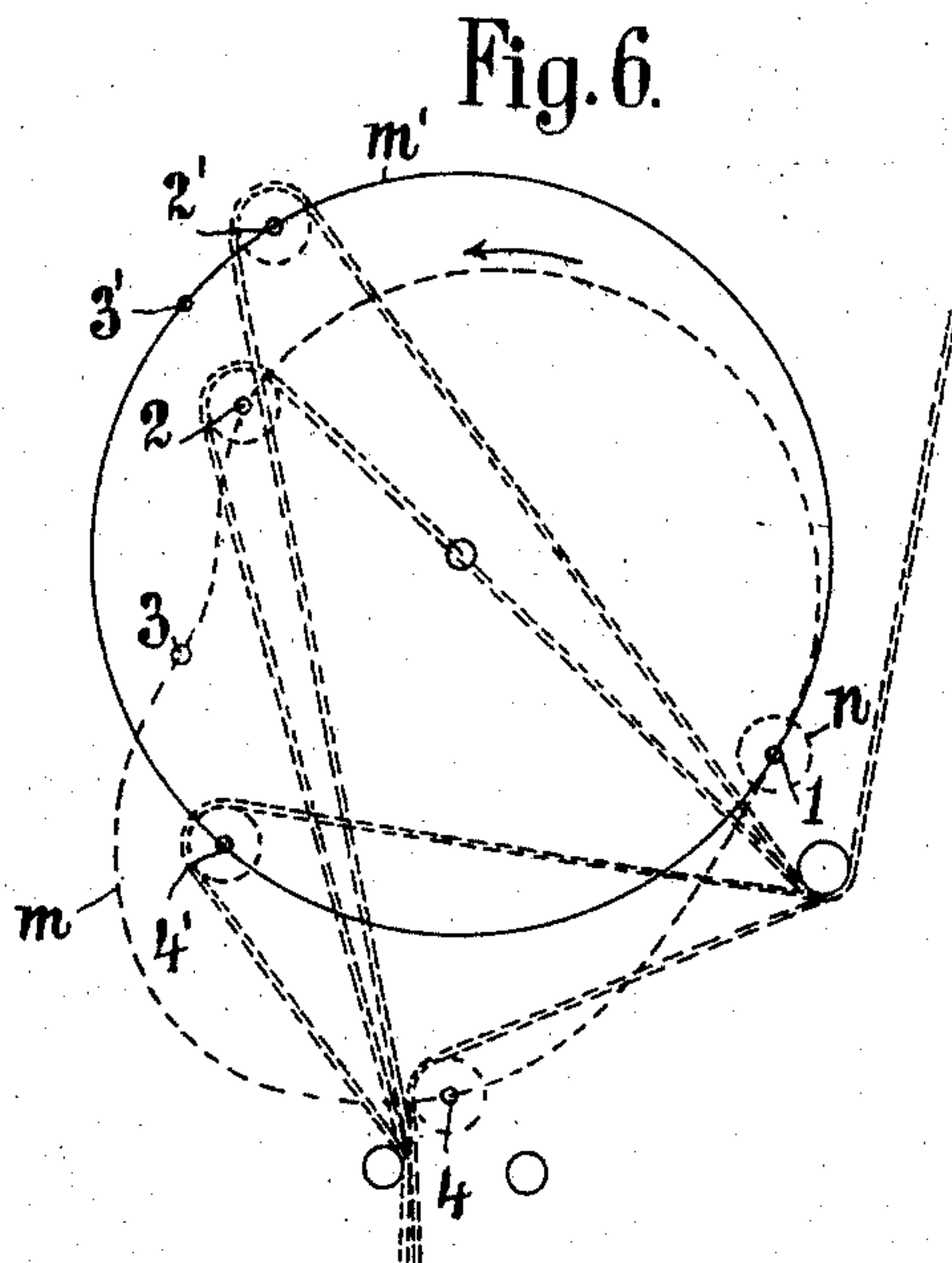
W. BÜSCHER.

PATENTED SEPT. 3, 1907.

THREAD TAKE-UP FOR SEWING MACHINES.

APPLICATION FILED APR. 13, 1906.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WILHELM BÜSCHER, OF BIELEFELD, GERMANY, ASSIGNOR TO THE FIRM OF ANKER-WERKE AKTIEN-GESELLSCHAFT VORMALS HENGSTENBERG & CO., OF BIELEFELD, GERMANY.

THREAD TAKE-UP FOR SEWING-MACHINES.

No. 865,234.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed April 13, 1906. Serial No. 311,459.

To all whom it may concern:

Be it known that I, WILHELM BÜSCHER, a subject of the King of Prussia, residing at No. 8 Dorotheenstrasse, Bielefeld, Kingdom of Prussia, German Empire, have
5 invented certain new and useful Improvements in Thread Take-Ups for Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

Rotating thread take-up devices for sewing machines, as usually arranged heretofore, are mounted to rotate upon fixed axes at varying speed, so as to take up the slack of the thread and to give slack as required. The radius of the take-up, however, is necessarily somewhat limited and the length of thread
10 which can be taken up is therefore limited correspondingly. It has been sought in some instances to overcome this difficulty and to make it possible to take up a greater length of thread by providing two coöperating take-up devices, but such an arrangement is found
15 too complicated in practice.

In accordance with the present invention the take-up has not only its usual rotary movement, but it receives in addition a movement of bodily translation, preferably in a vertical direction. For convenience,
20 the movement of translation is secured by mounting the rotary take-up upon the vertically reciprocating needle-bar.

The invention will be more fully described hereinafter with reference to the accompanying drawings in which, for purposes of explanation of the nature of the invention, it is illustrated as embodied in a suitable structure.
30

In the drawings, Figure 1 is a view in front elevation of so much of a sewing machine as is necessary to enable the application of the invention to be understood, the rotating take-up being represented by dotted lines in order that other parts behind the same may be shown more clearly; Figs. 2, 3 and 4 are views similar to Fig. 1, but illustrating the parts in different successive positions; Fig. 5 is a view in side elevation of the parts shown in Fig. 1, a portion of the frame being shown in section and the looper being omitted. Fig. 6 is a diagrammatic view illustrating the real path of the take-up pin and the circular path which it
40 would follow if the take-up arm revolved on a fixed shaft.

In the embodiment of the invention represented in the drawings the needle-bar *a* is reciprocated vertically in the usual manner by a crank *c* on the driving
50 shaft *b* and a link *d*. The rotating take-up *e*, also of usual construction, is mounted so as to have a movement of bodily translation, its shaft *f* being, in the present instance, journaled in a bearing block *g* on the needle-bar, so that it moves up and down therewith.
55 For the purpose of rotating the take-up *e* during its up

and down movement with the needle-bar, an opposite crank *h* is fixed to the pin of the crank *c* and at its end is connected by an intermediate link *i* with a crank *k* on the shaft *f* of the take-up, so that an irregular rotary motion is communicated to the take-up pin *n* of the
60 take-up *e* during the up and down movement of the take-up and the pin *n* describes a path represented by the dotted line *m* in Fig. 1. If the rotary movement of the pin were regular the path *m* would be a symmetrical ellipsoidal curve, but by reason of the irregular rotation, the curve *m* has a somewhat irregular form as indicated.
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When the needle-bar *a* is in its highest position, as indicated in Fig. 1, the bearing of the shaft *f* is momentarily at a standstill and as the rotation of the
70 take-up continues the pin *n* at that moment moves in the arc of a circle. The looper *p* at this moment stands in such a position that the thread-loop *s* has passed its lowest position and is about to be drawn off. After a quarter rotation of the driving shaft *b* the parts assume the positions represented in Fig. 2, in which the
75 take-up pin *n* reaches the position marked 2 on the curve *m* in Fig. 1. During the movement to this position the loop *s* is quickly drawn off from the looper *p* and contracts and the thread then slackens with the
80 continued descent of the needle, as it moves downward to make the stitch. During the next quarter rotation of the shaft *b* the take-up pin *n* advances to the point marked 3 on the path *m* in Fig. 1 and the thread is further slackened slightly. In this position
85 the needle penetrates the fabric and reaches its lowest position. At the beginning of the next quarter rotation of the shaft *b* the looper *p* seizes the loop *s* as it is formed by the upward movement of the needle. The thread is slackened at first slowly and thereafter
90 rapidly during the upward movement of the needle-bar. At the end of this quarter rotation of the shaft *b* the take-up pin *n* reaches the point marked 4 of the path *m* in Fig. 1 and during this movement the loop
95 *s* is drawn completely around the looper *p* and the thread is at first relaxed relatively somewhat further by the action of the take-up and thereafter the stretching of the thread begins, while the needle-bar returns to its highest position. At the end of this quarter rotation the take-up pin *n* again reaches its initial
100 position, marked 1 on the path *m* in Fig. 1.

As indicated by the distribution of the points 1, 2, 3 and 4 on the path *m*, the movement of the take-up pin *n* is quite irregular. It has its greatest speed from the point 1 to the point 2, that is, during the
105 taking up of the thread, which may take place at high speed as the thread loop *s* is then liberated from the looper. The formation of the loop also takes place at a rather high speed, as indicated by the distance from the point 3 to the point 4, the thread being then rap-
110

idly slackened. During the interval of time between the contraction of one thread loop and the formation of the next loop, the take-up pin n has its slowest speed, its movement being then from the point 2 to the point 3.

In order to illustrate the effect of the up and down movement of the shaft of the thread take-up with the needle bar upon the relaxing of the thread, the curve m (Fig. 6) is illustrated in connection with a circle m' which the thread take-up pin would describe, if the thread lever turned about a stationary axis, the position of which would correspond to the position shown in Fig. 1. To the points 1, 2, 3 and 4 of the curve m correspond the points 1, 2', 3' and 4' of the circle m' , and it is seen directly that difference of the length of thread taken up by the take-up pin is greater between 2 and 4 than between 2' and 4'. Therefore the thread lever ascending and descending with the needle bar relaxes the thread during the loop formation more and, besides, more rapidly than a thread take-up with stationary axle.

It will be obvious that various changes in details of construction and arrangement can be made without departing from the spirit of the invention, in accord-

ance with which the take-up has a movement of bodily translation as well as a movement of rotation.

I claim as my invention:

1. A rotating take-up for sewing machines, a reciprocating part upon which the rotating take-up is mounted and means to rotate the take-up during its reciprocation.
2. In a sewing machine, a reciprocating part, a rotating take-up having its shaft mounted on said reciprocating part, a crank shaft, and connections between the crank shaft and the take-up to rotate the same during its reciprocation.
3. In a sewing machine, a needle-bar, a rotating take-up mounted on the needle-bar, a crank shaft, and connections between the crank shaft and the take-up to rotate the latter during its reciprocation.
4. In a sewing machine, a reciprocating needle-bar, a crank shaft, connections between the crank shaft and the needle-bar to reciprocate the latter, a shaft mounted in a bearing on the needle-bar, a take-up carried by said shaft, a crank arm on said shaft, and link connection between the latter and the crank shaft.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILHELM BÜSCHER.

Witnesses:

OTTO DÜKER,
OTTO ALTENBERG.