

No. 778,147.

PATENTED DEC. 20, 1904.

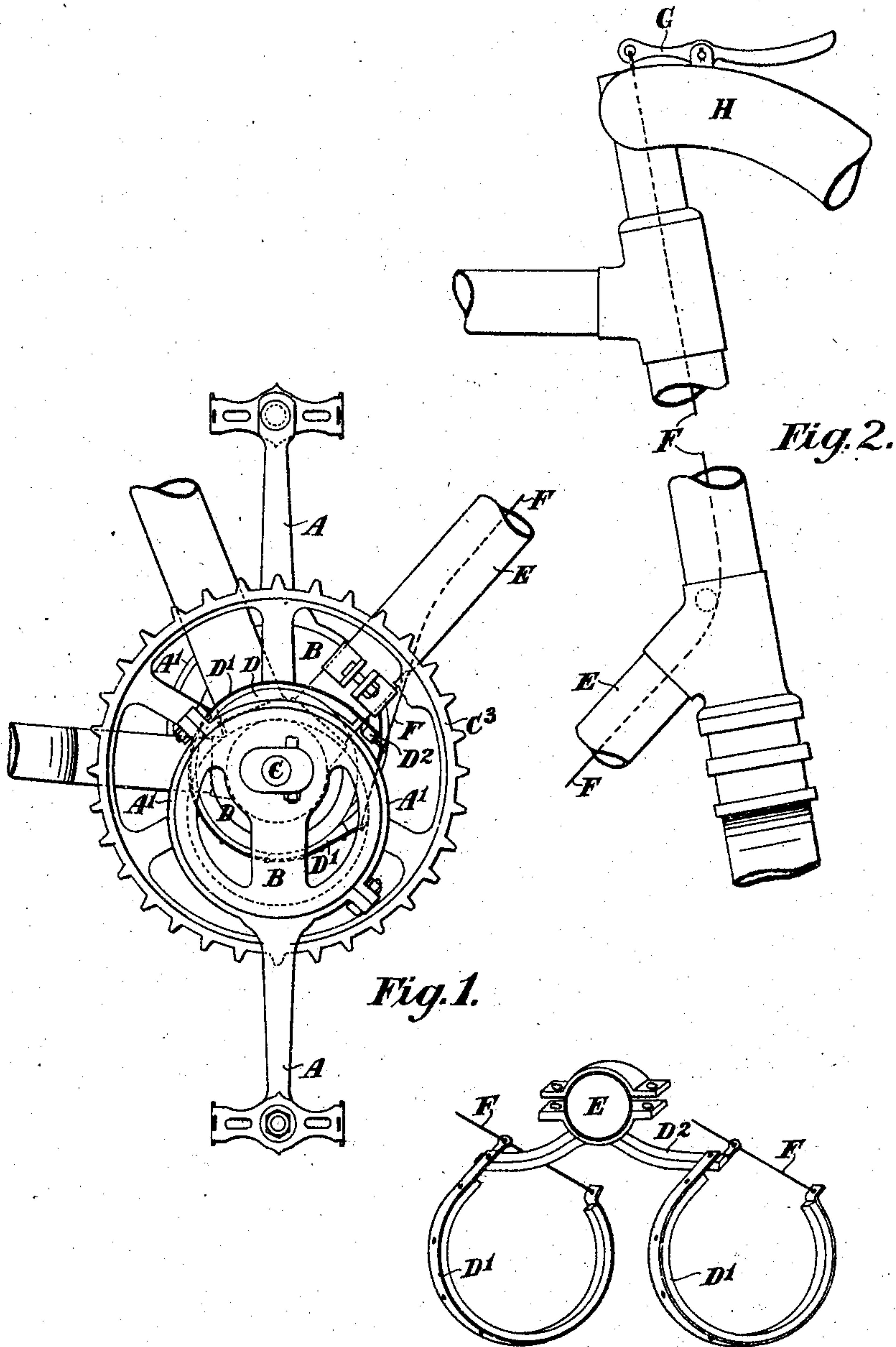
J. RITSCHER.

ADJUSTABLE THROW CRANK FOR CYCLES OR OTHER MACHINES.

APPLICATION FILED JAN. 18, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

W. B. Kessler
C. D. Kessler

Inventor
Joseph Ritscher
By *James L. Norris*
Atty.

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3 SHEETS—SHEET 2.

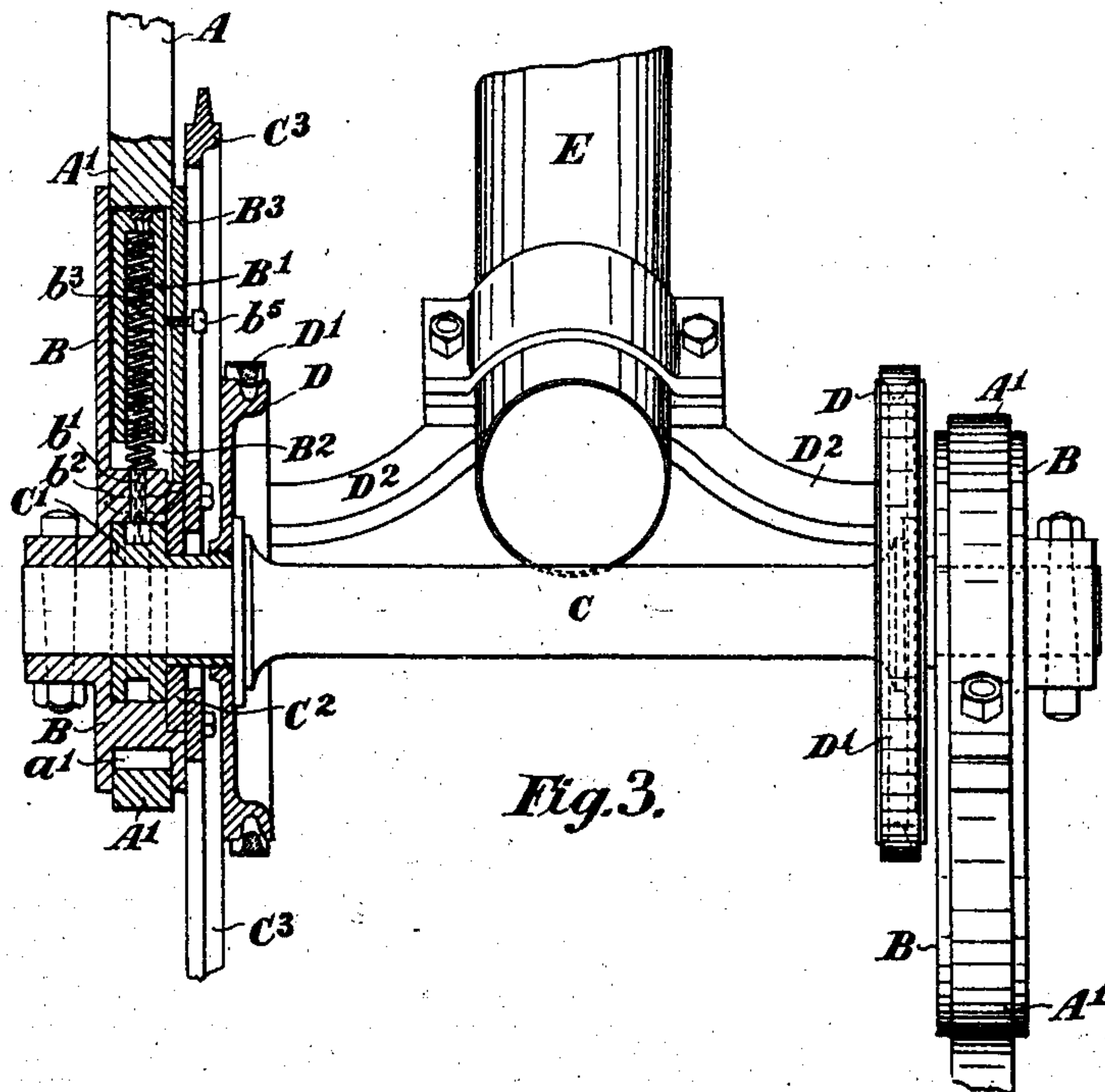


Fig. 3.

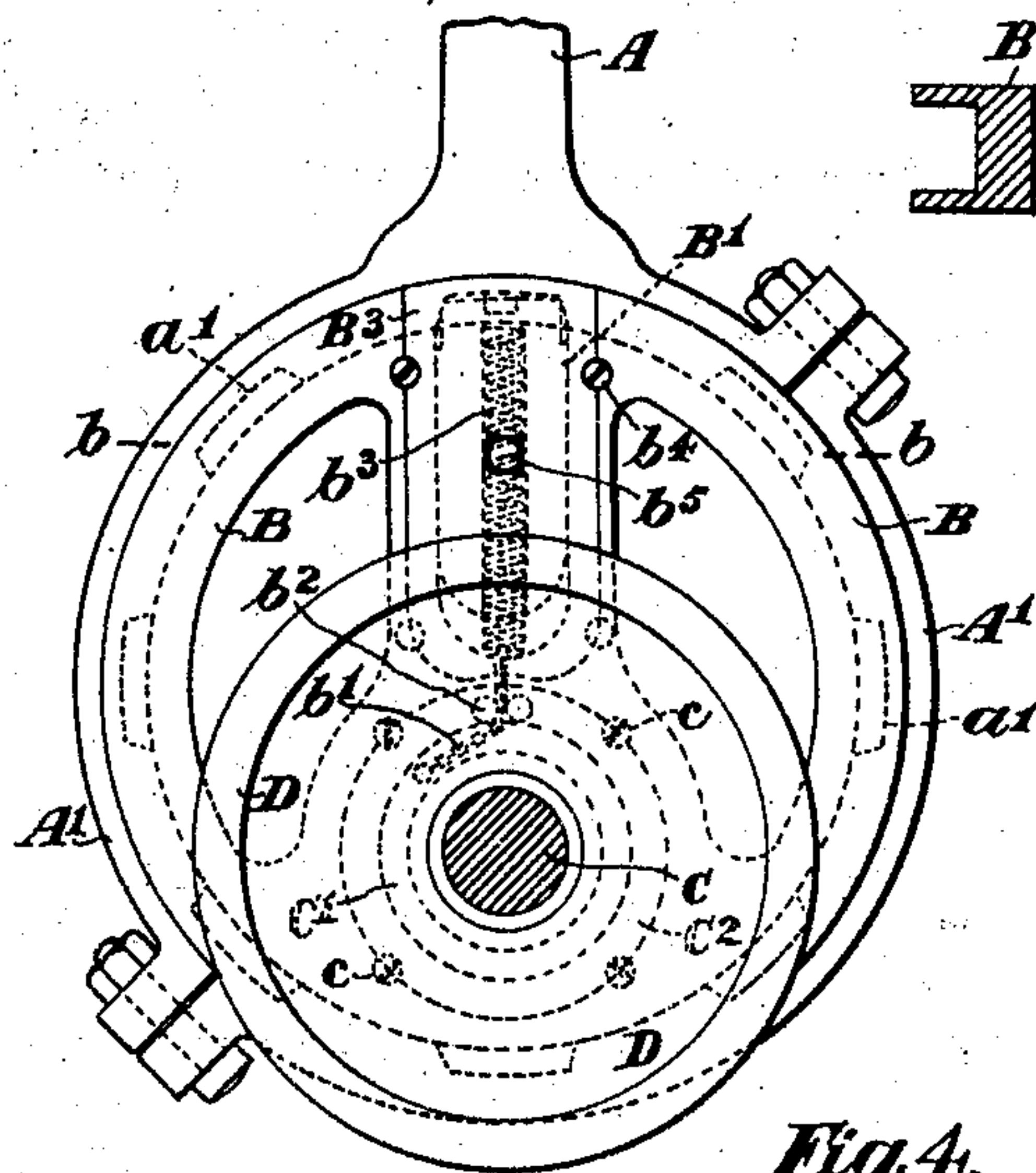


Fig. 4.

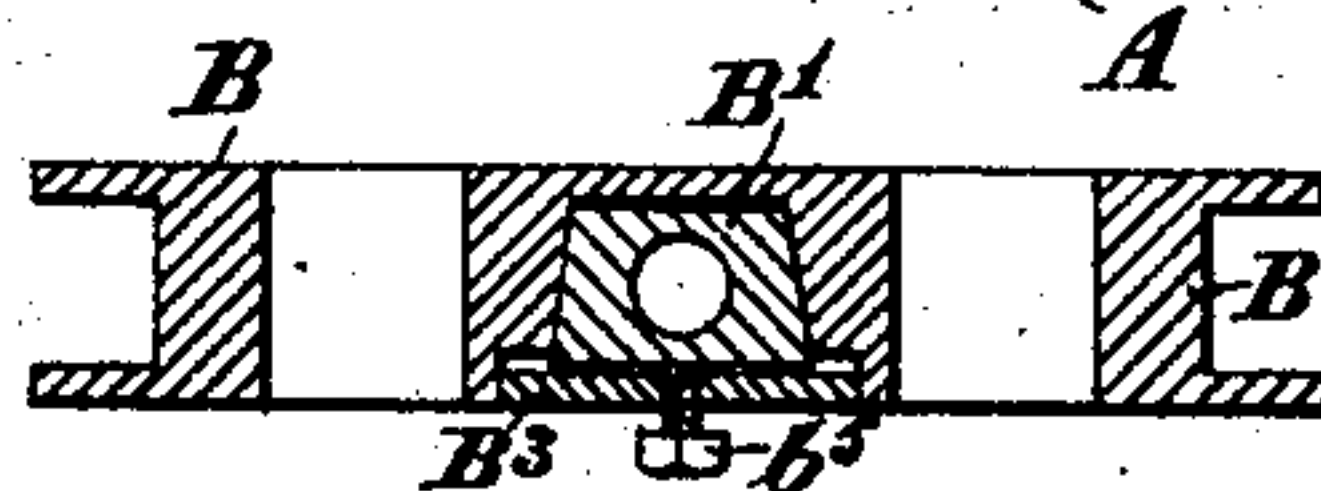


Fig. 5.

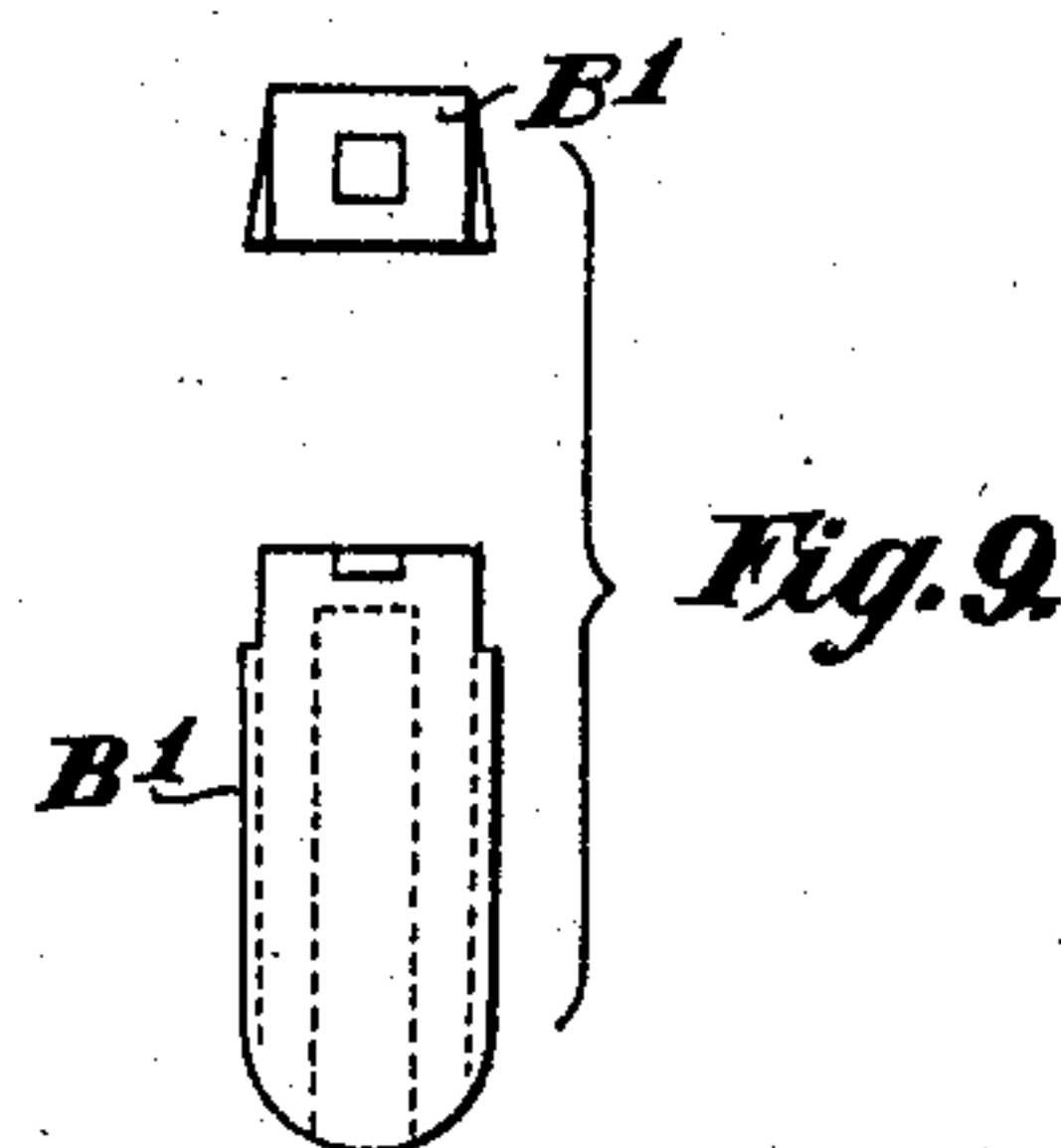


Fig. 9.

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No. 778,147.

PATENTED DEC. 20, 1904.

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ADJUSTABLE THROW CRANK FOR CYCLES OR OTHER MACHINES.

APPLICATION FILED JAN. 19, 1904.

NO MODEL.

3 SHEETS—SHEET 3.

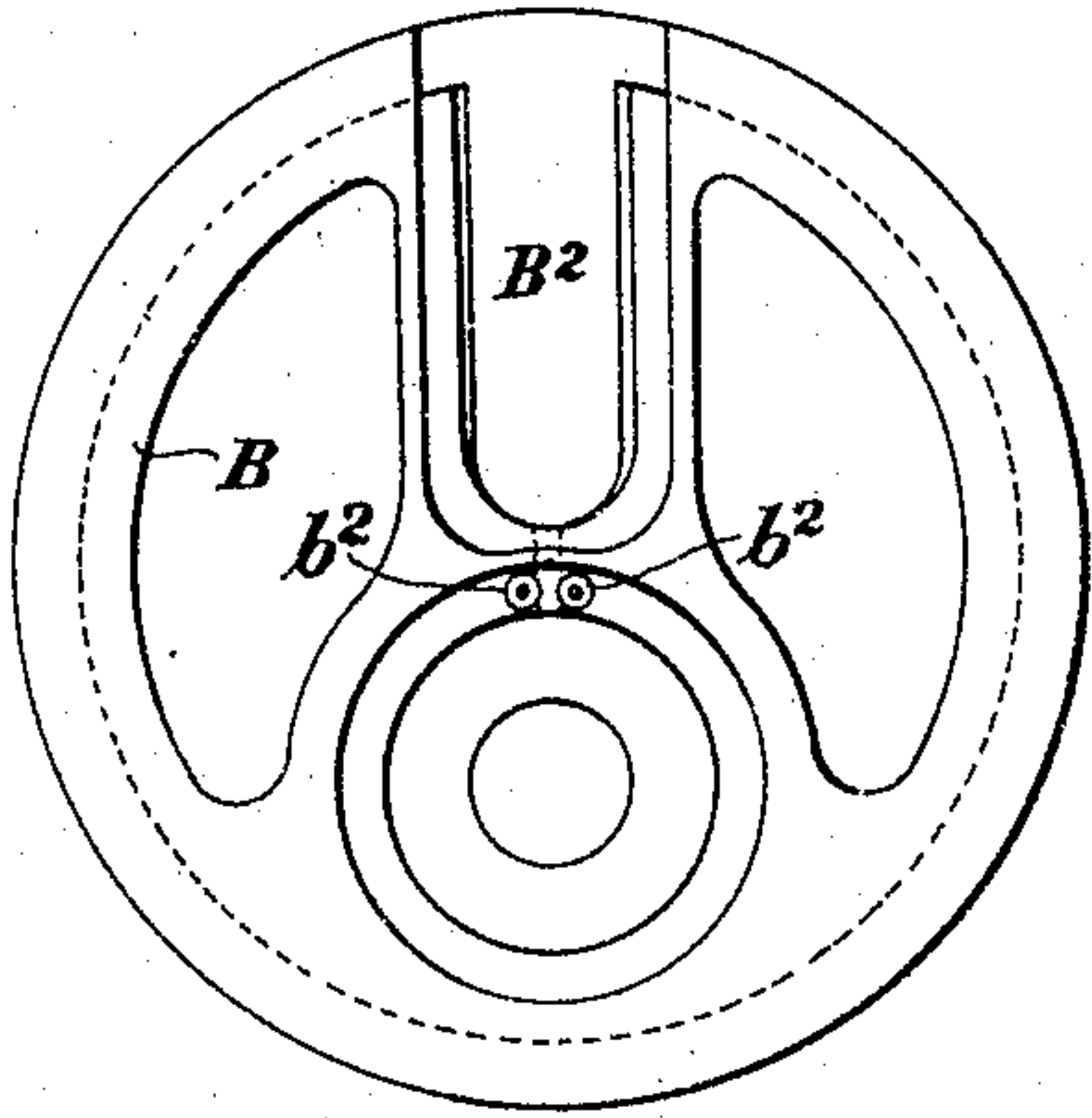


Fig. 6.

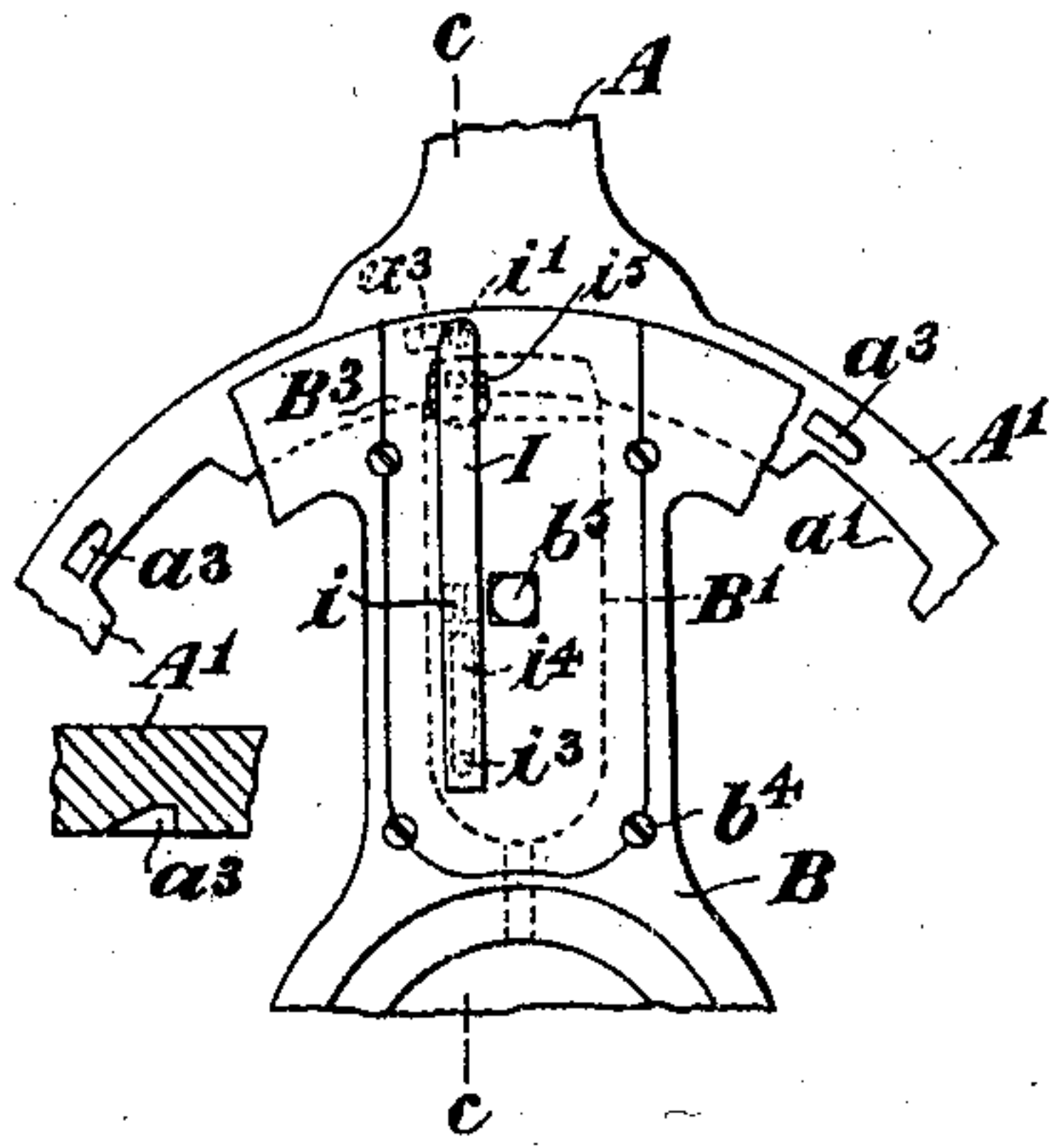


Fig. 11.

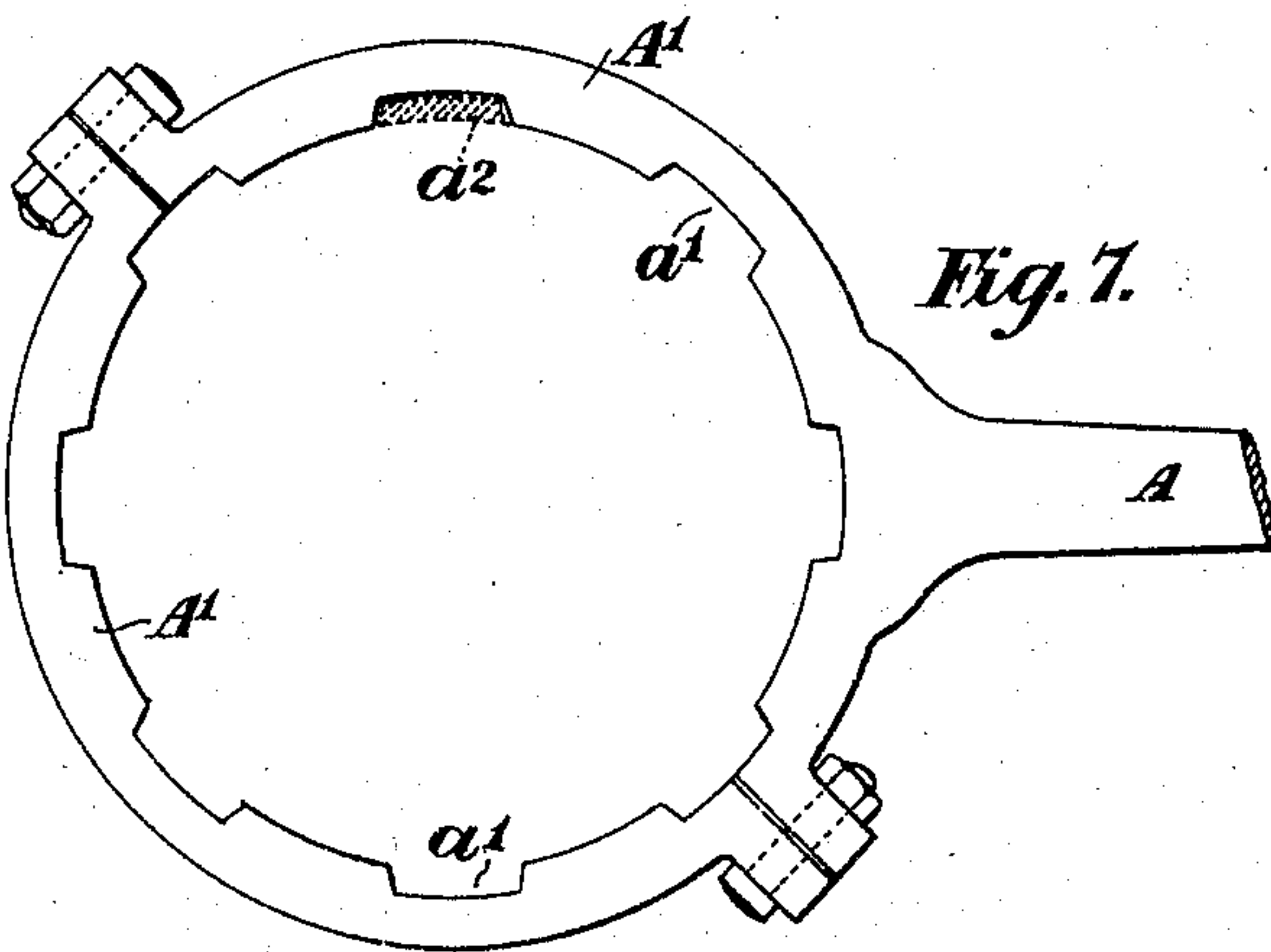


Fig. 7.

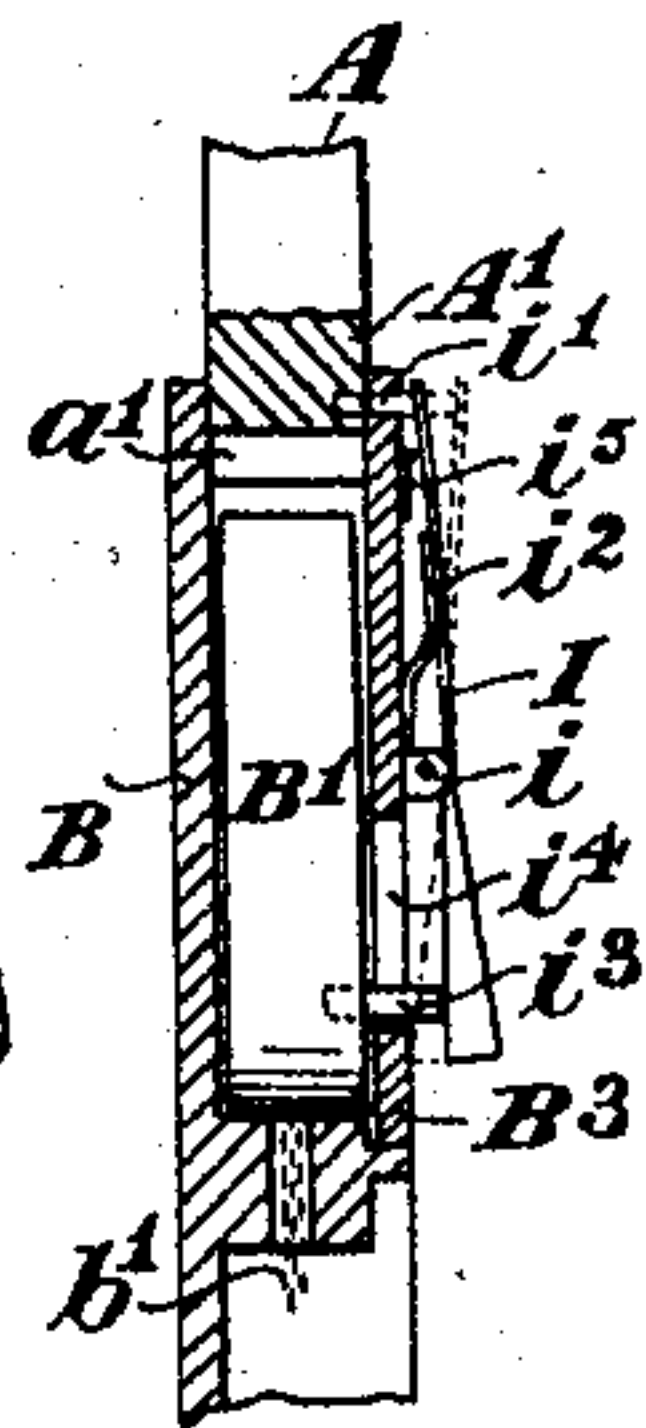


Fig. 12.

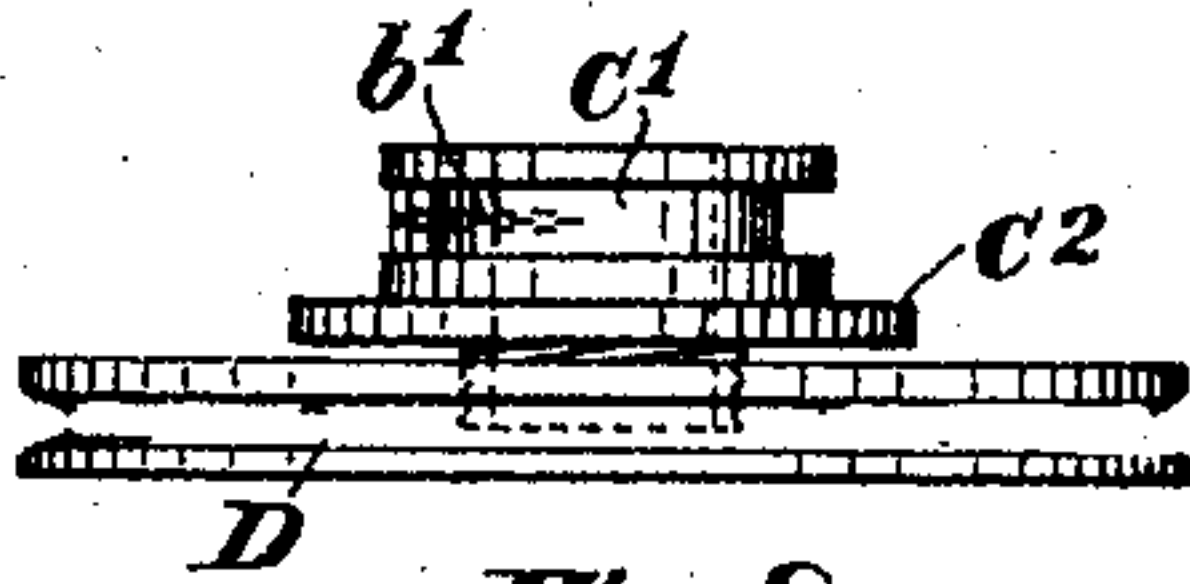


Fig. 8.

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UNITED STATES PATENT OFFICE.

JOSEPH RITSCHER, OF MELBOURNE, VICTORIA, AUSTRALIA.

ADJUSTABLE THROW-CRANK FOR CYCLES OR OTHER MACHINES.

SPECIFICATION forming part of Letters Patent No. 778,147, dated December 20, 1904.

Application filed January 18, 1904. Serial No. 189,598.

To all whom it may concern:

Be it known that I, JOSEPH RITSCHER, engineer, a subject of the Emperor of Germany, residing at No. 319 Swanston street, Melbourne, in the British State of Victoria, Commonwealth of Australia, have invented a new and useful Adjustable Throw-Crank for Cycles or other Machines, of which the following is a specification.

10 This invention consists of an adjustable throw-crank for cycles and other machines. It is so constructed and arranged that the adjustment of the throw or the increasing or decreasing of the stroke of the cranks can be effected by the cycle-rider while he is upon the machine, and hence the throw of the cranks can be readily increased to ascend a hill or incline and, conversely, be lessened when upon a level road.

20 The invention is also adapted for use with any crank-operated machines wherein it is necessary to adjust the throw of the cranks, and where such machines are constructed embodying this invention the throw of the cranks may be adjusted while the machine is in operation.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, wherein like reference characters denote corresponding parts throughout the several views, and in which—

Figure 1 is a side view of the adjustable throw-crank as arranged on the driving-spindle of a cycle, and Fig. 2 a part side view of the upper part of the cycle-frame and handle-bar, while Fig. 3 shows a central vertical section and an edge view of the adjustable throw-crank gear as arranged on the end parts of the driving-spindle; Fig. 4, a side view of the adjustable throw-crank gear by itself; Fig. 5, a section on line *b b*, Fig. 4; Fig. 6, a side view of the eccentric which supports the strap of the crank or pedal arms, and Fig. 7 a side view of the strap by itself; Fig. 8, a plan of the bolt-releasing barrel and its attached brake-sheave; Fig. 9, a plan and a side view of the sliding bolt; Fig. 10, a perspective view of the brake-bands as attached to the supporting-bar; Fig. 11, a side view of a

spring-catch attachment to the sliding bolt, and Fig. 12 a sectional view on line *c c* of Fig. 11.

In constructing the invention for use on a cycle each crank-arm A is formed on the one-half of a divided eccentric band or strap A', the eccentric B for each strap being secured at each end part of the usual crank-axle C, upon which the sprocket or gear wheel C³ is secured, and it is by locking or setting each eccentric-strap A' at the desired position on its eccentric B that the requisite length of throw or stroke is obtained.

Each eccentric B is provided with a radial sliding bolt B', which is fitted into a recess B², and the internal face of the eccentric-strap A' has four, eight, or any number of gaps or notches *a'* formed at equidistant positions in it to fit the end of said sliding bolt B', so that various throws can be given to the pedals, which are carried on end of the crank-arm A of the eccentric-straps A'. The variation in stroke is usually from one-quarter of an inch to three inches, and when only a limited number of variations of throw are desired the surplus notches *a'* in the eccentric-strap A' can be stopped up by securing filling-pieces *a*² therein with set-screws, as shown by dotted lines in Fig. 7.

Each eccentric B has a small grooved barrel C' fitted loosely in an annular recess in it about the crank-axle C, and said barrel C' is connected by a small chain *b'* or other flexible medium passing between a pair of rollers *b*² with the said sliding bolt B'. The said sliding bolt B' is bored out to receive a coiled spring *b*³, the purpose of which is to force the bolt B' outward and into one of the said notches *a'* in the eccentric-strap.

B³ is a cover-plate above the sliding bolt B', said plate being secured in a recess in eccentric B by screws *b*⁴, and also it is provided with an adjustable set-screw *b*⁵, which bears against the sliding bolt B'.

An annular washer or cover C² is provided to fit over the neck of the loose barrel C', said washer being secured to the eccentric by the screws *c*. Affixed on the neck at one side of each of said small barrels C' is a brake-sheave D, and the one end of each brake-band D' 100

which fits in said sheave is secured to a cross-bar D^2 , which is clipped to the cycle-frame E, while the other free end of each brake-band is connected by a wire F or other flexible medium, which is either passed into the tubular frame E or guided by eyelets outside of it with a small lever G, carried on the handle-bar H, and hence by the rider putting on said brakes D' through the medium of the lever G and wire F the sliding bolts B' in the eccentrics B are drawn inward and release their hold of the eccentric-straps A' , bearing the crank or treadle arms A, so that they may be set at the requisite position in relation to the eccentrics as to give the desired throw, and when at such position the brake D' is released and the bolts B' will be shot by their springs b^3 into the requisite gaps or notches a' of the straps A' .

For cycles traveling at high speeds a spring stop-catch I is sometimes attached to the cover-plate B^3 of sliding bolt B' . Said stop-catch is centered at i and has a pin i'' on its outer end which is designed to pass through a hole in the eccentric-flange and thence into a tapered slot or recess a^3 in the edge of eccentric-strap. The other or back end of the stop-catch normally tapers inward toward the eccentric, while under its fore part is a spring i^2 . Again, i^3 is a pin secured into bolt B' , and said pin slides in the slot i^4 as the bolt is worked to and fro, so that when the bolt is withdrawn from the eccentric-strap the back end of stop-catch I is lifted by pin i^3 , and so forces its outer end inward and the pin i'' into the tapered slot a^3 , thus locking the eccentric and strap together at the requisite position to enable the bolt B' to be shot into the desired gap a' of the eccentric-strap to produce the necessary stroke. Also a pivoted button i^5 may be provided to pass under lever I and lift and retain the pin i'' out of the tapered slot a^3 .

The herein-described adjustable throw-crank may also be adapted for use on other machines, the brake-gear being constructed to suit the various conditions and requirements of the machine.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, means movable with the eccentric and rotatable relatively thereto and a connection between said last-mentioned means and the locking device, said rotatable means adapted when its movement is arrested during the movement of the eccentric to effect through the connection the release of said locking device and thereby permit of adjusting one of the adjustable parts with respect to its companion.

2. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, means movable with the eccentric and rotatable relatively thereto, a connection between said last-mentioned means and the locking device, said rotatable means adapted when its movement is arrested during the movement of the eccentric to effect through the connection the release of said locking device to permit of adjusting one of the adjustable parts with respect to its companion, and means for arresting the movement of said rotatable means.

3. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, means movable with the eccentric and rotatable relatively thereto, a connection between said last-mentioned means and the locking device, said rotatable means adapted, when its movement is arrested during the movement of the eccentric to effect through the connection the release of said locking device to permit of adjusting one of the adjustable parts with respect to its companion, and means adapted when operated to frictionally engage said rotatable means to arrest the movement thereof.

4. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, means movable with the eccentric and rotatable relatively thereto, a connection between said last-mentioned means and the locking device, said rotatable means adapted when its movement is arrested during the movement of the eccentric to effect through the connection the release of said locking device to permit of adjusting one of the adjustable parts with respect to its companion, means adapted when operated to frictionally engage said rotatable means to arrest the movement thereof and means for operating said last-mentioned means.

5. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a flexible device connected to the locking device, and means for acting against the flexible device to draw the same in a direction to release the locking device to permit of adjusting one of the adjustable parts with respect to its companion.

6. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a barrel, a flexible means connected to the locking device and to the barrel, and means for causing the flexible device to wind

on the barrel and release the locking device to permit of adjusting one of the adjustable parts with respect to its companion.

7. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a rotatable barrel, a connection between said barrel and the locking device, said barrel adapted when its movement is arrested during the movement of the eccentric to cause a relative rotation of the eccentric thereto and effect through said connection the release of said locking device to permit of adjusting one of the adjustable parts with respect to its companion, and means for arresting the movement of the barrel.

8. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a barrel movable with the eccentric and rotatable relatively thereto, and flexible means connecting the locking device to the barrel, said barrel adapted when its movement is arrested during the movement of the eccentric to cause a relative rotation of the eccentric with respect thereto and cause said flexible device to wind upon said barrel and thereby release the locking device to permit of adjusting one of the adjustable parts with respect to its companion.

9. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a barrel movable with the eccentric and rotatable relatively thereto, flexible means connecting the locking device to the barrel, said barrel adapted when its movement is arrested during the movement of the eccentric to cause a relative rotation of the eccentric with respect thereto and thereby cause the flexible device to wind upon the barrel and release the locking device to permit of adjusting one of the adjustable parts with respect to its companion, and means for arresting the movement of the barrel.

10. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a rotatable barrel, a connection between the locking device and the barrel, said barrel adapted, when its movement is arrested during the movement of the eccentric to effect through the connection the release of said locking device to permit of adjusting one of the adjustable parts with respect to its companion, means for arresting the movement of the barrel, and means adapted to frictionally engage said barrel for arresting the movement thereof.

11. An adjustable throw-crank, comprising an eccentric and a band, one of which is ad-

justable with relation to the other, a locking device for maintaining them in an adjusted relation, a rotatable barrel movable with the eccentric and rotatable relatively thereto, flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the rotation of the eccentric to wind upon the barrel and release the locking device to permit of adjusting one of the adjustable parts with respect to its companion, means for arresting the movement of the barrel, and means for operating said last-mentioned means.

12. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a rotatable barrel, flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the rotation of the eccentric to wind upon the barrel and release the locking device to permit of adjusting one of the adjustable parts with respect to its companion, a disk operative with said barrel, and means adapted to frictionally engage with said disk for arresting the movement of the barrel.

13. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a rotatable barrel, flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the rotation of the eccentric to wind upon the barrel and release the locking device to permit of adjusting one of the adjustable parts with respect to its companion, a disk operative with said barrel, and a friction-band surrounding said disk adapted when tightened to frictionally engage the same and arrest the movement thereof.

14. An adjustable throw-crank, comprising an eccentric and a band, one of which is adjustable with relation to the other, a locking device for maintaining them in an adjusted relation, a rotatable barrel, flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the rotation of the eccentric to wind upon the barrel and release the locking device to permit of adjusting one of the adjustable parts with respect to its companion, a disk operative with said barrel, a friction-band surrounding said disk, adapted when tightened to frictionally engage the same and arrest the movement thereof, and means for tightening said friction-band.

15. An adjustable throw-crank comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, means movable

with the eccentric and rotatable relatively thereto, and a connection between said last-mentioned means and the locking device and adapted, when the movement of said rotatable means is arrested during the rotation of the eccentric to release said bolt to permit of adjusting the band with respect to the eccentric.

16. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, means movable with the eccentric and rotatable relatively thereto, means connecting said last-mentioned means to the locking device and adapted, when the movement of said rotatable means is arrested during the rotation of the eccentric to release said bolt to permit of adjusting the band with respect to the eccentric, and means for arresting said rotatable means.

17. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, means movable with the eccentric and rotatable relatively thereto, means connecting said last-mentioned means to the locking device and adapted, when the movement of said rotatable means is arrested during the rotation of the eccentric to release said bolt to permit of adjusting the band with respect to the eccentric, and means adapted when operated to frictionally engage said rotatable means to arrest the movement thereof.

18. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, means movable with the eccentric and rotatable relatively thereto, means connecting said last-mentioned means to the locking device and adapted, when the movement of said rotatable means is arrested during the rotation of the eccentric to release said bolt to permit of adjusting the band with respect to the eccentric, means adapted when operated to frictionally engage said rotatable means to arrest the movement thereof and means for operating said last-mentioned means.

19. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a flexible device connected to the locking device, and means for acting against the flexible device to draw the same in a direction to release the bolt to permit of adjusting the band with respect to the eccentric.

20. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a barrel, a flexible means connected to the locking device and to the barrel, and means for causing the flexible device to wind on the barrel and release the bolt to permit of adjusting the band with respect to the eccentric.

21. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a rotatable barrel, a connection between the rotatable barrel and the sliding bolt, said connection adapted when the movement of the barrel is arrested during the rotation of the eccentric to release the bolt to permit of adjusting the band with respect to the eccentric, and means for arresting the movement of the barrel.

22. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a rotatable barrel movable with the eccentric and rotatable relatively thereto, and flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the rotation of the eccentric to wind upon the barrel and release the bolt to permit of adjusting the band with respect to the eccentric.

23. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a rotatable barrel movable with the eccentric and rotatable relatively thereto, flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the rotation of the eccentric to wind upon the barrel and release the bolt to permit of adjusting the band with respect to the eccentric and means for arresting the movement of the barrel.

24. An adjustable throw-crank comprising an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a rotatable barrel, flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the forward movement of the eccentric to wind upon the barrel and release the bolt to permit of adjusting the barrel with respect to the eccentric, a disk operative with said barrel, and means adapted to

frictionally engage with said disk for arresting the movement of the barrel.

25. An adjustable throw-crank, comprising an eccentric provided with a sliding bolt, a
5 band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a rotatable barrel, flexible means connecting the locking device to the
10 barrel and adapted when the movement of the barrel is arrested during the forward movement of the eccentric to wind upon the barrel and release the bolt to permit of adjusting the band with respect to the eccentric, a disk operative with said barrel, and a friction-band
15 surrounding said disk adapted when tightened to frictionally engage the same and arrest the movement thereof.

26. An adjustable throw-crank, comprising
20 an eccentric provided with a sliding bolt, a band surrounding said eccentric and provided with a series of notches adapted to receive said sliding bolt for adjustably locking the band and eccentric together, a rotatable barrel,
25 flexible means connecting the locking device to the barrel and adapted when the movement of the barrel is arrested during the forward movement of the eccentric to wind upon the barrel and release the bolt to permit of ad-
30 justing the band with respect to the eccentric, a disk operative with said barrel, a friction-band surrounding said disk adapted when tightened to frictionally engage the same and arrest the movement thereof, and means for
35 tightening said friction-band.

27. An adjustable throw-crank, comprising an eccentric, a band movable therewith and adjustable with respect thereto, a locking device for connecting the band to the eccentric
40 and means adapted to engage and be operated

by said locking device when the latter is released for momentarily arresting the movement of the band to position the same to receive the locking device.

28. An adjustable throw-crank, comprising 45 an eccentric, a band surrounding said eccentric, a locking device for maintaining the eccentric and band in their adjusted relation and a lever mechanism operable by said locking device, said lever mechanism adapted when
50 said locking device is released to be operated thereby and engage said band for momentarily arresting the latter for positioning it to permit said locking device to lock the band and
55 eccentric together.

29. An eccentric, a band movable therewith and adjustable with respect thereto, a locking device for connecting the band to the eccentric, means for releasing the locking device,
60 and means for automatically and momentarily arresting the movement of the band at a position to permit the locking device to lock the band to the eccentric.

30. An adjustable throw-crank, comprising 65 an eccentric and a band, one of which is adjustable with relation to the other, locking mechanism adapted to normally maintain said parts in their adjusted relation, means for releasing said locking mechanism, and a lever
70 mechanism adapted, when said locking mechanism is released, to momentarily arrest the movement of said adjustable part to permit the locking device to lock it to its companion in a desired position.

In witness whereof I have hereunto set my 75 hand in presence of two witnesses.

JOSEPH RITSCHER.

Witnesses:

BEDLINGTON BODZCOMB,
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