No. 615,564. Patented Dec. 6, 1898.

G. C. MANDLEBERG & J. J. YOUNG.

BACK PEDALING BRAKE.

(Application filed Dec. 15, 1897.)

(No Model.) 3 Sheets—Sheet 1.

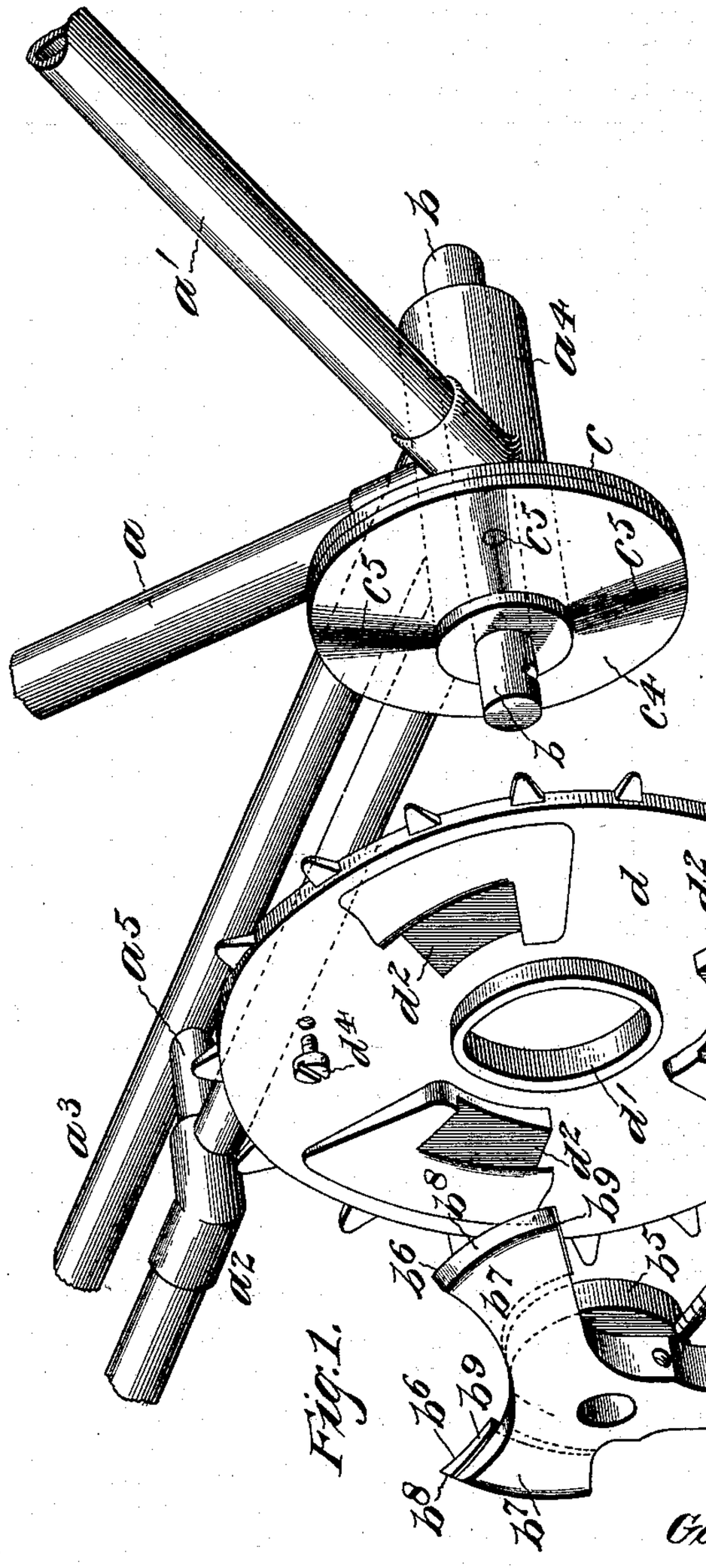

Fig. 1.

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Fig. 1.ª

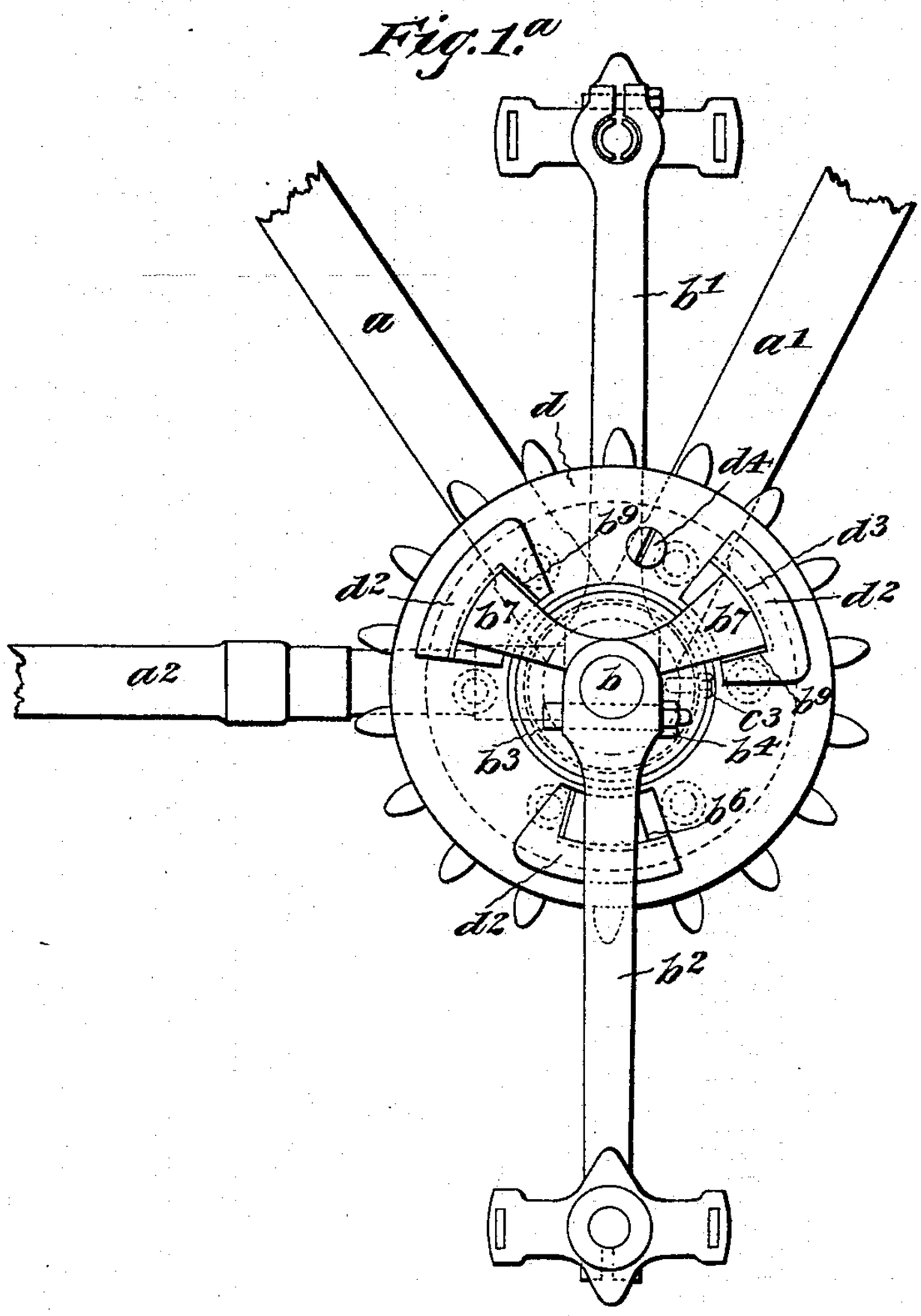
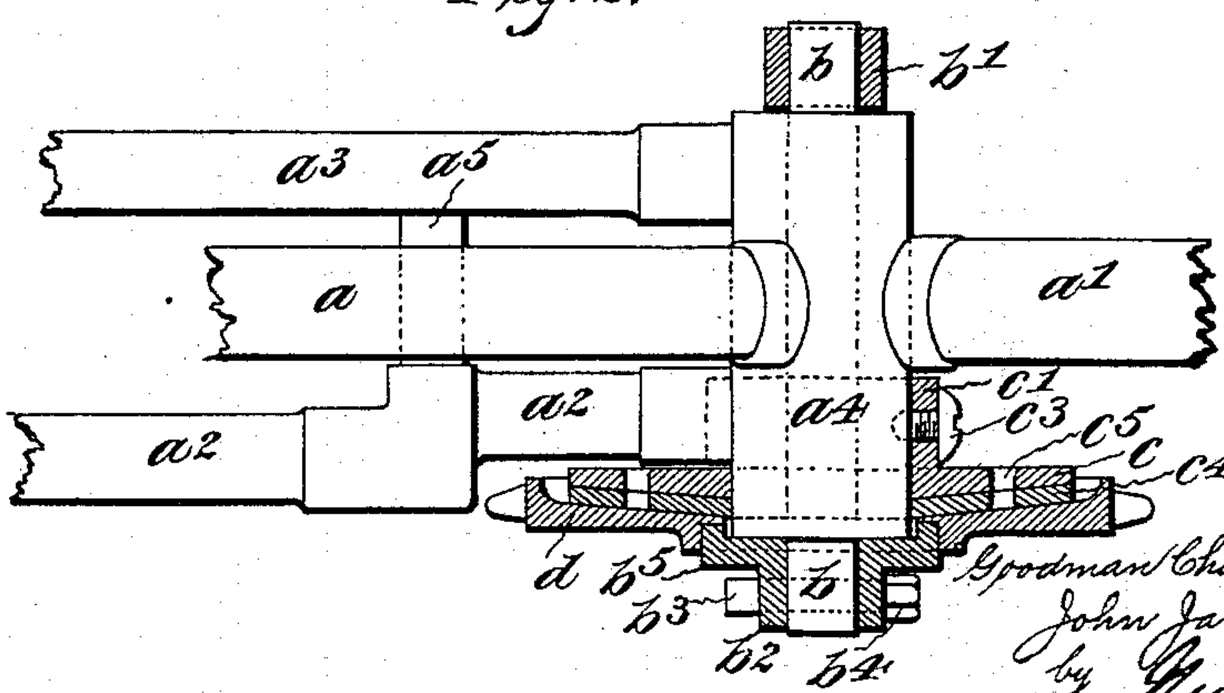


Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

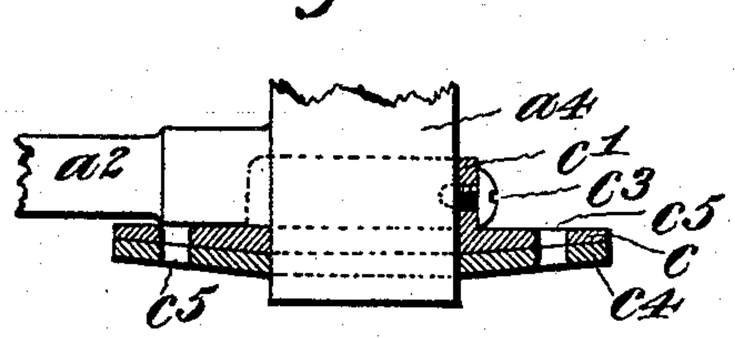


Fig. 4.

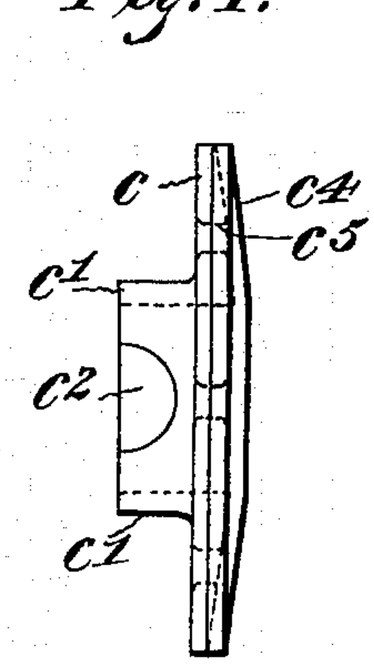


Fig. 5.

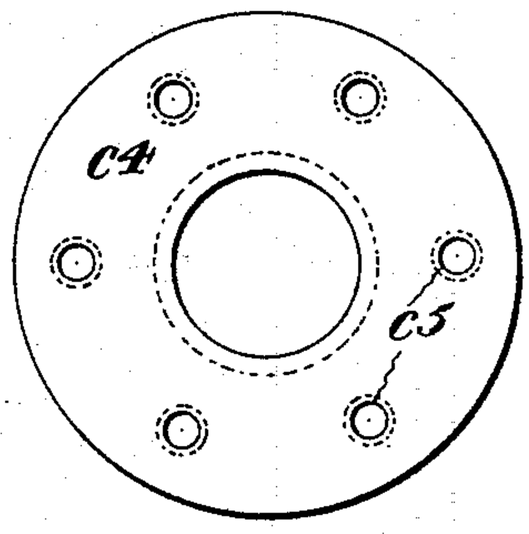


Fig. 6.

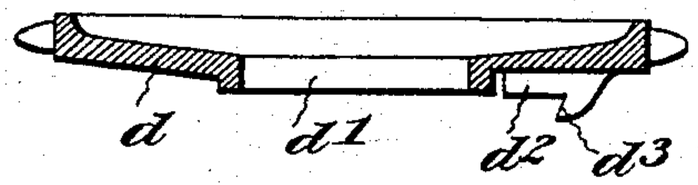


Fig. 7.

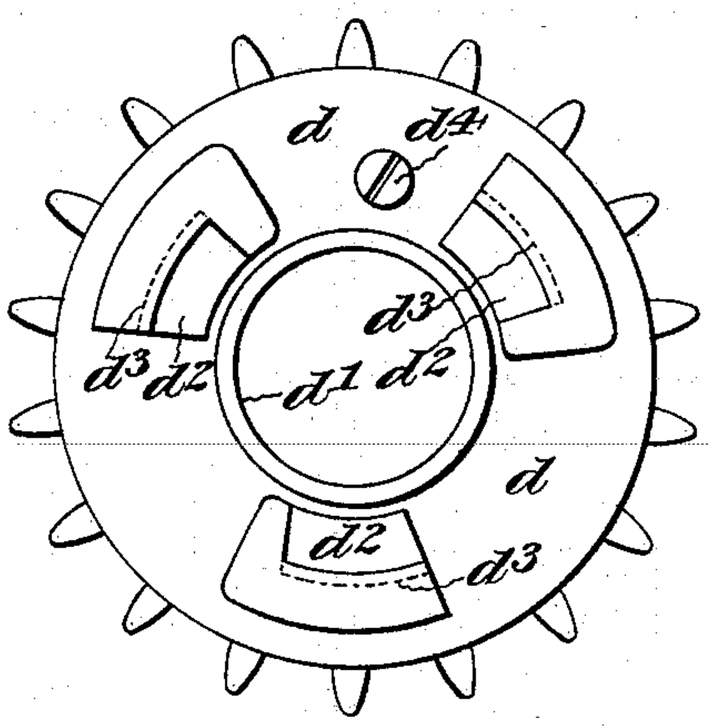


Fig. 8.

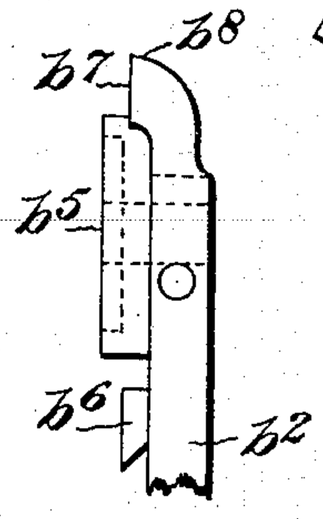
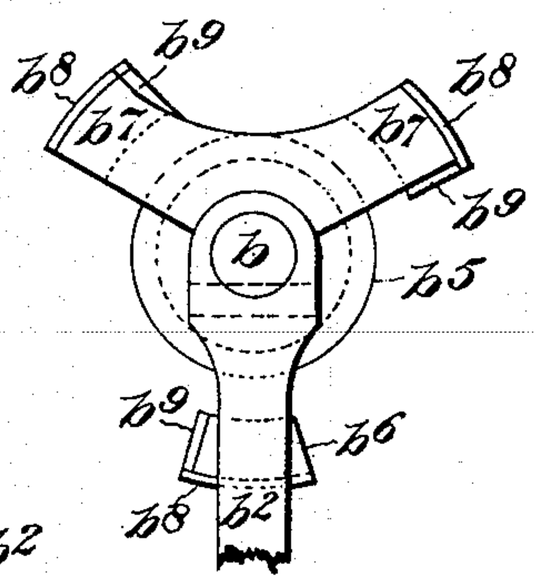


Fig. 9.



Witnesses.
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B. B. Sommers

Inventors.
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by Henry Wells
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UNITED STATES PATENT OFFICE.

GOODMAN CHARLES MANDLEBERG, OF MANCHESTER, AND JOHN JAMES YOUNG, OF LONDON, ENGLAND.

BACK-PEDALING BRAKE.

SPECIFICATION forming part of Letters Patent No. 615,564, dated December 6, 1898.

Application filed December 15, 1897. Serial No. 662,073. (No model.)

To all whom it may concern:

Be it known that we, GOODMAN CHARLES MANDLEBERG, residing at Manchester, in the county of Lancaster, and JOHN JAMES YOUNG, residing at Plumstead, London, in the county of Kent, England, subjects of the Queen of Great Britain and Ireland, have invented certain new and useful Improvements in Brakes for Velocipedes, (for which we applied for Letters Patent for the United Kingdom of Great Britain and Ireland on the 6th day of March, 1897, numbered 6,011;) and we do hereby 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to an improved combination of mechanism for braking velocipedes, the brake being applied by "back-pedaling" or resisting the rotation of the pedal-cranks, and thus of the crank-shaft, and being withdrawn when the pedals are worked in the forward direction, the force of the braking action varying with the amount of resistance in back-pedaling.

We carry out our invention by securing a disk-plate faced with leather or similar suitable material to the frame of the velocipede, this disk being stationary and concentric with the crank-shaft, and the plane or face of it is at a right angle to the axis of the crank-shaft. The chain-wheel is not keyed or secured on the crank-shaft, but is so mounted that it can rotate or oscillate in the direction of rotation to a limited extent and at the same time move laterally—that is, in the direction of the line of the crank-axle. This mounting of the chain-wheel, as above described, is by screw inclines or sections or segments of screw inclines or wedges. That incline which would correspond to the internal screw-thread is formed on the side of the disk of the chain-wheel, while the external thread is formed on the boss or arms on the pedal-crank, or these internal and external threads may be reversed—that is, the internal may take the place of the external thread. Thus arranged if the chain-wheel is held fast and the crank-pedal is partly rotated backward the disk side of the chain-wheel nearest the said stationary disk is screwed or forced against it and it then acts as a brake; but when the crank is propelled forward the chain-wheel is screwed or forced away from the stationary disk-brake surface by reason of its interlocked wedging or screw mechanisms. In use the chain-wheel is not held from rotating, as it is only necessary to retard its rotation or to act to propel it to produce the application and withdrawal of the chain-wheel from the fixed brake-disk surface, as above explained.

Figure 1 is a perspective view of the detached parts of our brake in their relative positions. Fig. 1ª is a side elevation of so much of a bicycle and its framing around the crank-hanger as will be necessary to explain our invention. Fig. 2 is a plan of the parts or some of them shown in Fig. 1, the fixed disk, chain-wheel, and part of the cranks being shown in section. Fig. 3 is a detached view in the plane of Fig. 2 of a part of the framing connected with the crank-hanger, in which the bearings of the crank-shaft are carried, also showing the brake-disk secured thereto in section. Fig. 4 is a front, and Fig. 5 a face, view of the fixed brake-disk detached. Fig. 6 is an edge sectional view, detached, of the chain-wheel; and Fig. 7 is an outside face view of the same, showing the segments of screw inclines or wedges thereon. Fig. 8 is an edge view, and Fig. 9 a front or outside face view, of one of the pedal-arms near its boss, shown detached with the three screw inclines or segments thereon.

a is part of the tube-framing going upward to join the framing near the saddle; a', part of the tube-framing going to that part of the framing forming the socket or bearing for the axis to which the handle-bars are secured and upon which the steering-wheel swivels.

a^2 is part of one tube of the framing on one side of the driving-wheel, and a^3 is the part of the tube on the other side of the driving-wheel, these frame-tubes a^2 and a^3 going to the axis of the driving-wheel.

The tubes a, a', a^2, and a^3 join the boss a^4 of the framing in which the pedal-shaft has its bearings. One of the tubes a^2 is cranked, as shown best in Fig. 2, in order to get the

mechanism in as little space as possible, and is strengthened by a cross-tube a^5.

b is the pedal-shaft in bearings in the crank-hanger a^4, upon one end of which one crank b' is secured in the usual manner. The boss of the other crank b^2 is also secured to the other end of the shaft b in the usual manner—that is, by a key b^3 with a screw-nut b^4 on one end. (See Figs. 1 and 2.) The boss of this crank b^2 has a dished disk b^5 formed upon it, the dished or concave part going over the end of the crank-hanger a^4 of the framing, as shown best in Fig. 2.

The fixed brake-disk c is formed with a boss c', having a notch c^2 cut out on one side to admit the tube-frame a^2 when the disk is placed in position, and it is secured to the crank-hanger a^4 by a screw c^3, which screws through the boss c', the inner end of the screw entering a hole or hollow in the crank-hanger a^4. (See Figs. 2 and 3.) The metal disk c is faced with leather c^4, secured to the metal disk by rivets c^5.

The chain-wheel d is dished on one side and contacts or frictionally engages the disk c when acting to brake. The wheel d has a short boss d', that fits upon the disk part b^5 of the crank b^2, and the face of the outside of the wheel is made with three or more undercut segmental inclines or wedges d^2, which fit corresponding inclines, one, b^6, formed on the crank b^2, the other two, b^7, on each of the two short arms from the boss part of the lever b^2. These inclines b^6 and b^7 on the crank b^2 are beveled on their outer edges b^8 and are screw-inclined on their inner faces to fit corresponding inclines and undercut recesses d^3 in the inclined segments d^2 on the chain-wheel. When the crank b^2 is brought with its disk part b^5 to fit into the hole in the boss d' of the chain-wheel and is then partly rotated, the inclines b^6 and b^7 on the arm b^2 and its short arm fit and enter the undercut inclines d^2 on the chain-wheel, and when thus placed in position a pin d^4 (see Figs. 1 and 7) is screwed into the face of the chain-wheel and stands out from its side, which prevents the crank being turned so far back in relation to the wheel as to allow the inclines on the crank to leave the sunk inclines on the face of the wheel.

A piece of leather or other suitable material b^9 is or may be secured on the forward driving ends of each of the inclines on the pedal-lever to prevent noise and shock when they come against the ends of the inclines d^2 on the chain-wheel. In Fig. 1 the forward or driving ends of the inclines b^9 on the crank are shown against the end of each of the undercut incline segments d^2 on the chain-wheel, in which position the wheel d is drawn toward the boss of the crank b^2 by the inclined beveled edges b^8 on the arms of the pedal-lever, which act on the undercut parts d^3 of the incline segments on the chain-wheel, and then the wheel is away from and clear of the leather face c^4 of the disk c; but when the rotation of the pedals is resisted, as when back-pedaling, then the inclines on the crank move backward from the position in which they are shown in Fig. 1, and the screw-inclined faces b^7 on the arms of the crank b^2 then force the inside disk of the wheel d against the face c^4 of the leather on the disk, as shown in Fig. 2, and this breaks or retards the motion of the pedal-shaft b and wheel d and the driving-wheel through the chain.

It will be observed that the undercuts in the inclines or wedges d^2 hold the bevels of the complementary wedges attached to the spider-arms on the crank, and in whatever relative position the inclines or wedges may be during braking or driving they are always interlocked, so that the chain-wheel is drawn away from as well as forced against the friction-disk.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. In a bicycle brake mechanism, the combination with the crank-hanger, crank, a friction-disk and a loosely-mounted sprocket-wheel; of undercut inclines on said wheel, a spider on the crank, and beveled faces on the ends of the spider-arms adapted to take into the undercuts and coöperate with said inclines, substantially as set forth.

2. In a bicycle brake mechanism, the combination with the crank-hanger, a friction-disk and a loosely-mounted sprocket-wheel; of concentric inclines provided with peripheral undercuts and complementary inclines provided with beveled edges operated by the crank, said beveled edges taking into the undercuts, for the purpose set forth.

In testimony that we claim the foregoing as our invention we have signed our names each in the presence of two subscribing witnesses.

GOODMAN CHARLES MANDLEBERG.
JOHN JAMES YOUNG.

Witnesses to the signature of Goodman Charles Mandleberg:

PETER J. LINSEY,
WILLIAM FAULKNER.

Witnesses to the signature of John James Young:

RICHARD OLIVER YOUNG,
FREDERICK NORRIS.