

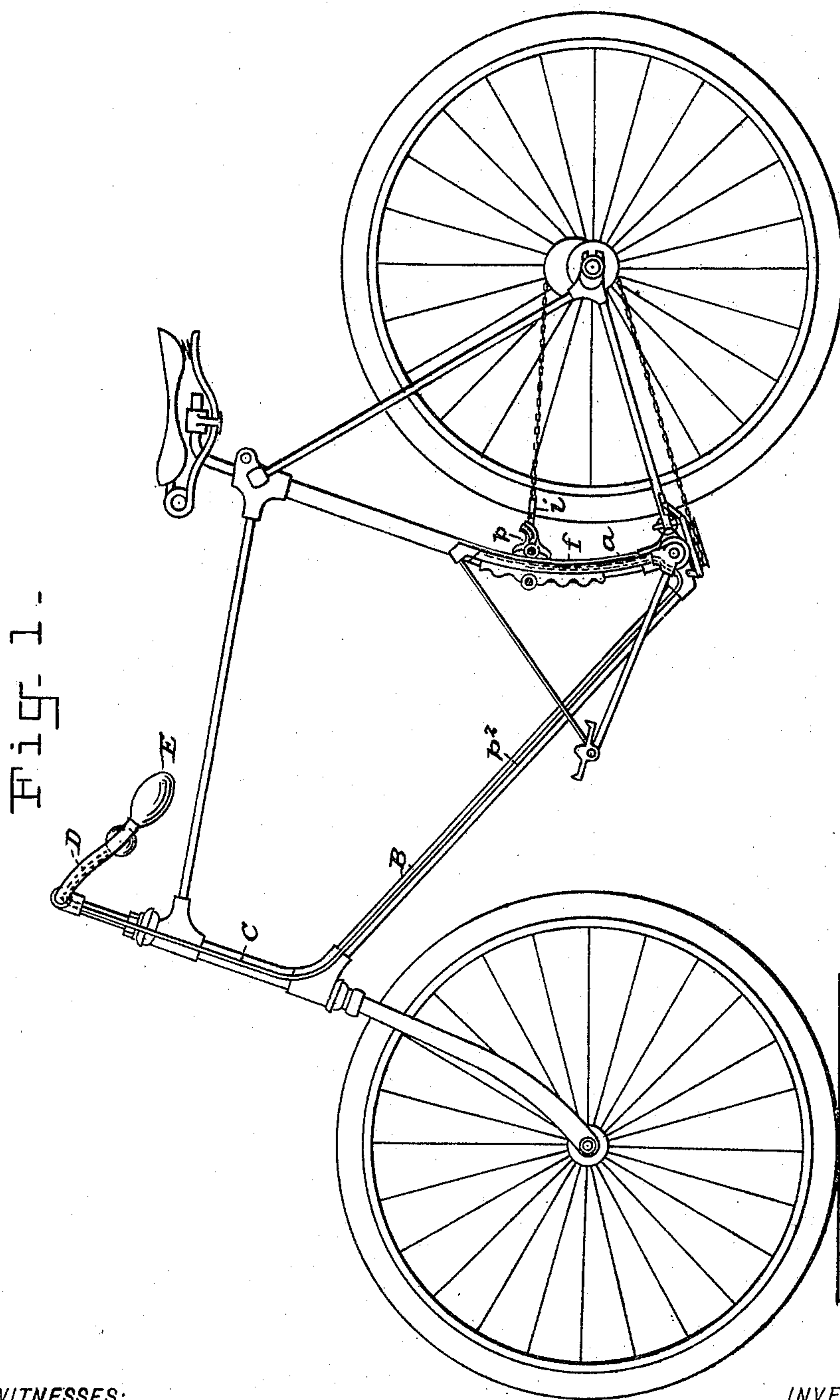
(No Model.)

2 Sheets—Sheet 1.

F. LJUNGSTRÖM.
TREADLE MECHANISM.

No. 573,016.

Patented Dec. 15, 1896.



WITNESSES:

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E. A. Scott

INVENTOR:

Fredrik Ljungström
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(No Model.)

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Fig. 4.

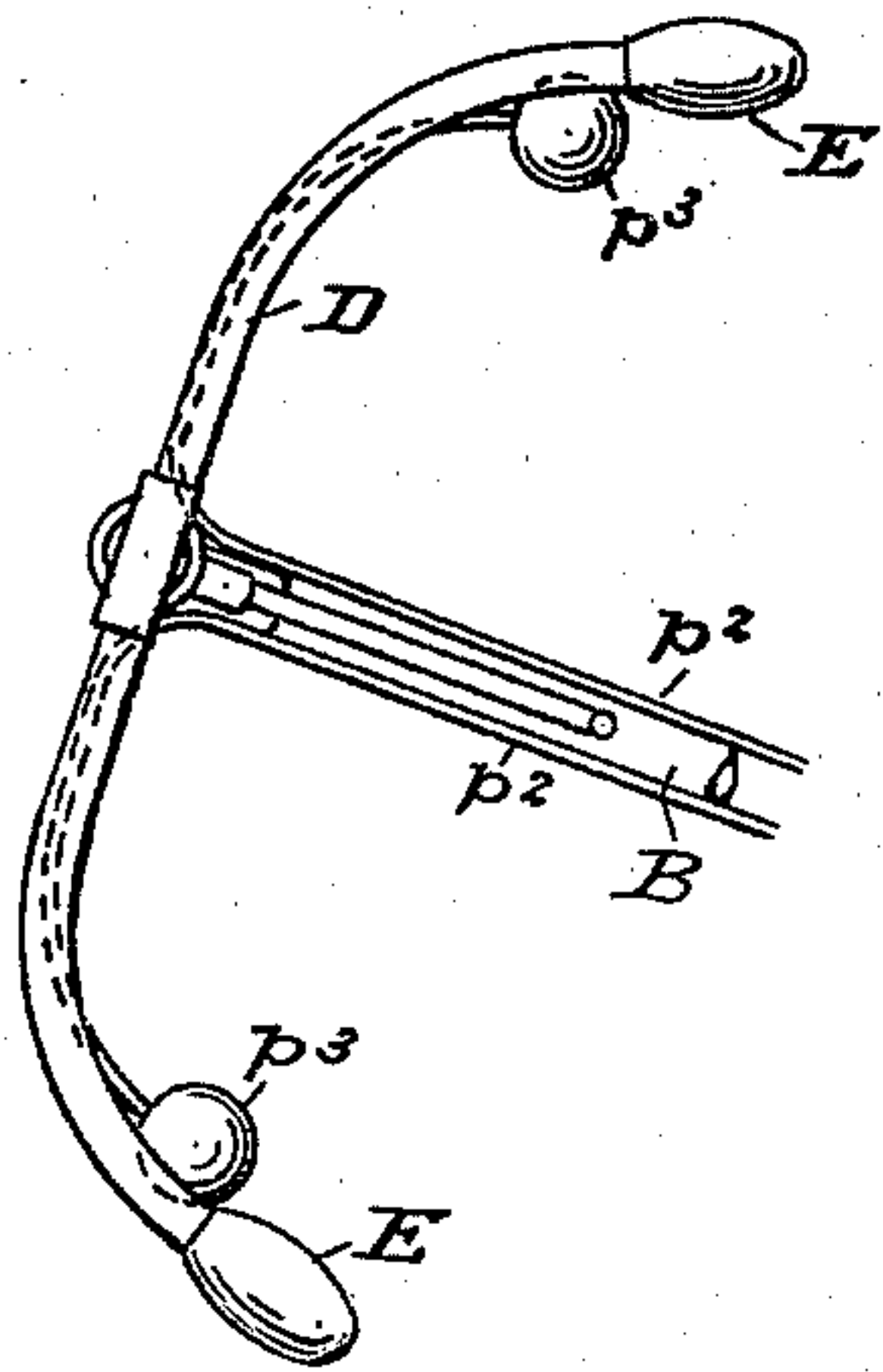


Fig. 2.

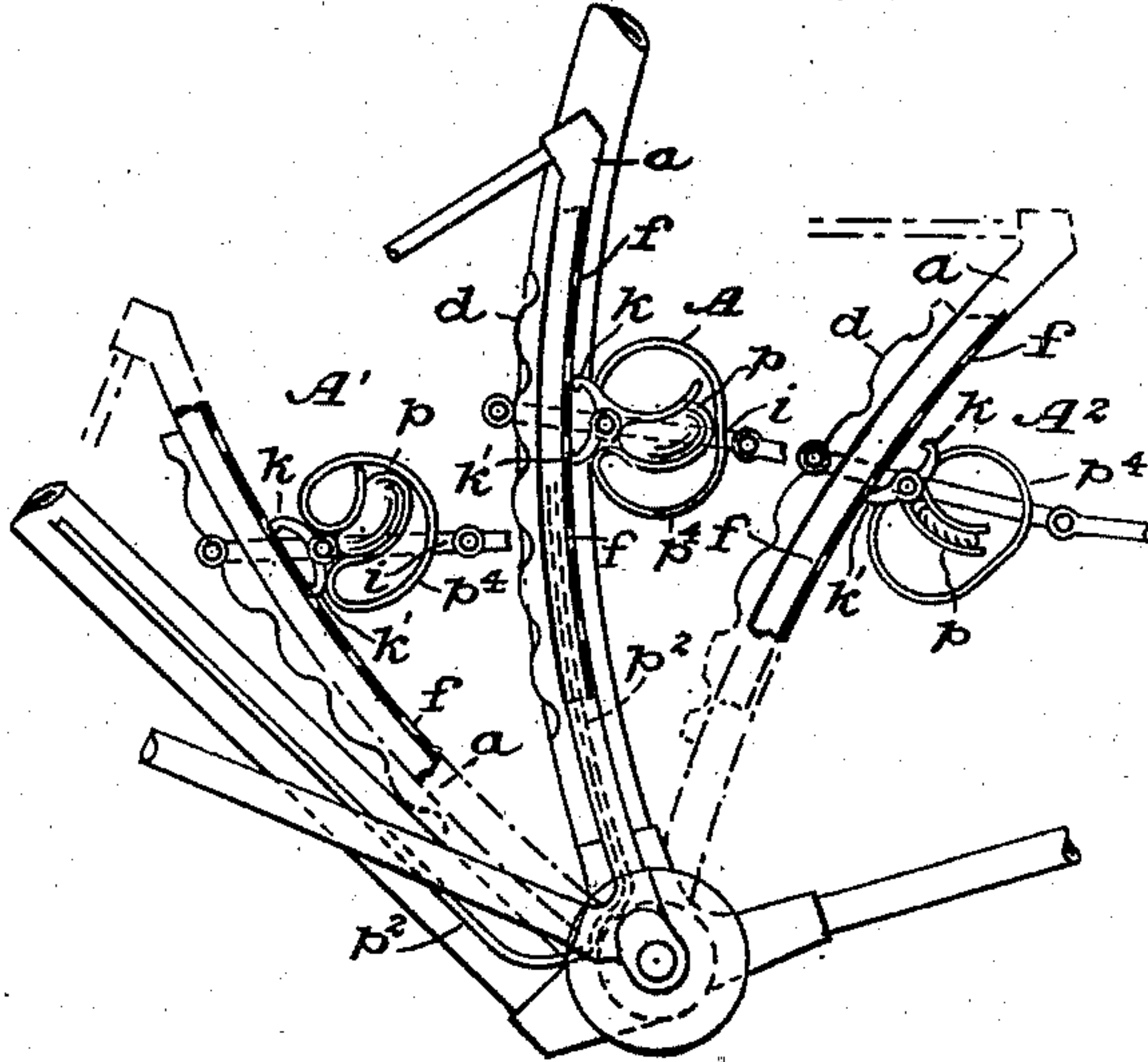
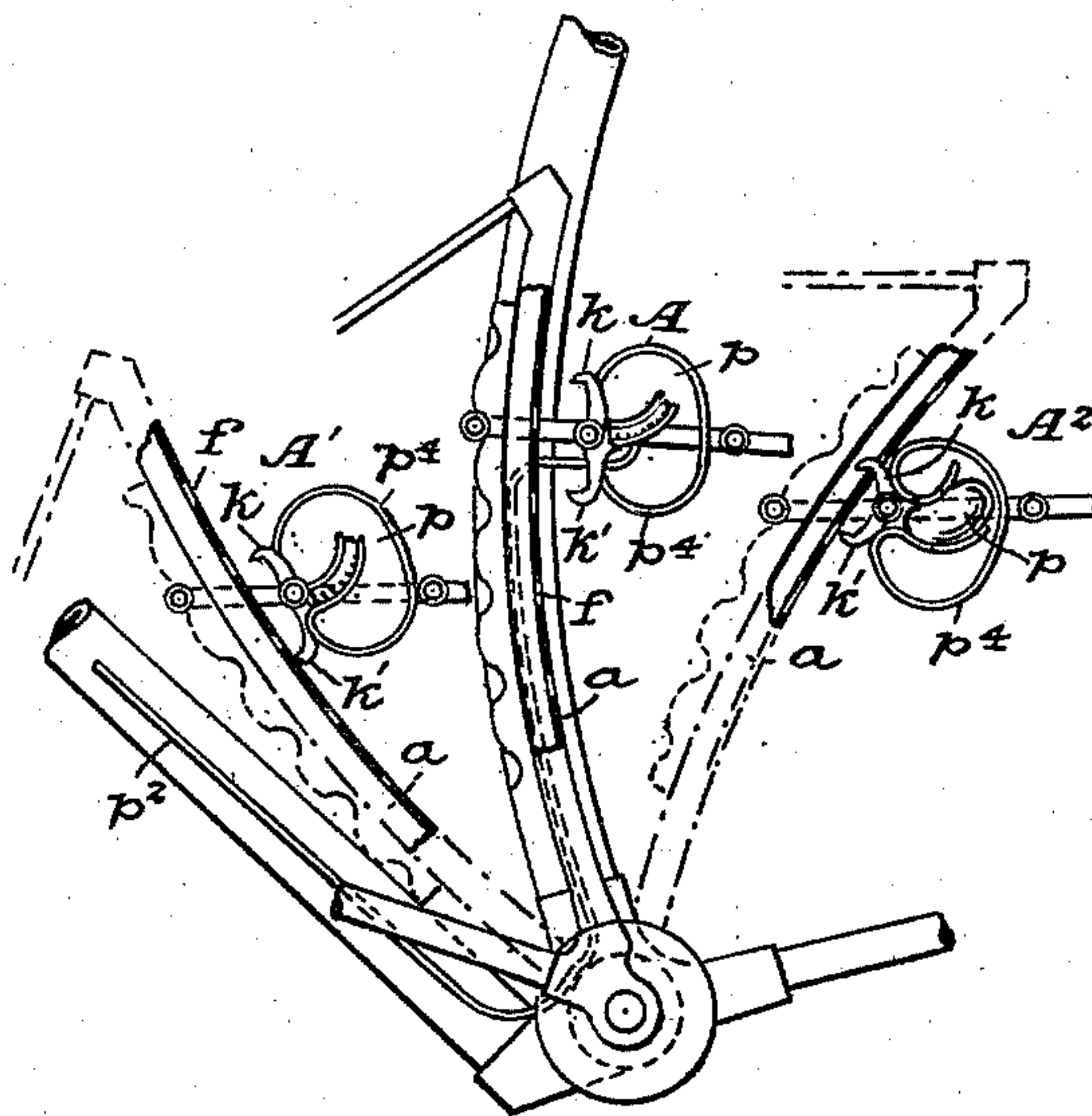


Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDRIK LJUNGSTRÖM, OF STOCKHOLM, SWEDEN.

TREADLE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 573,016, dated December 15, 1896.

Application filed March 21, 1896. Serial No. 584,344. (No model.) Patented in Belgium October 2, 1895, No. 117,704.

To all whom it may concern:

Be it known that I, FREDRIK LJUNGSTRÖM, mechanician, a subject of the King of Sweden and Norway, and a resident of Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Treadle Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has been patented in Belgium under date of October 2, 1895, No. 117,704.

15 This invention relates to an improvement in the mechanism described in my prior patent application, Serial No. 555,778, filed July 12, 1895, said mechanism having for its object the changing of the point of application of the load or power on treadles, levers, and such like.

20 The improvement in this mechanism now in view consists therein that it may be operated pneumatically.

Figure 1 in the drawings is an elevation of a velocipede provided with said improvement. 25 Fig. 2 illustrates the treadle of the same in different positions. Fig. 3 illustrates also the treadle of the velocipede in different positions, some parts of the mechanism being shown in another position than in Fig. 2. 30 Fig. 4 is a plan view of the steering-bar of the velocipede.

Along the treadle-arm *a* may be moved a loop or stirrup, hereinafter termed the "bow," *i*, to which the driving-chain is fixed. The 35 bow engages somewhere between the teeth *d*, and is thereby prevented from sliding by itself along the arm *a*. Two hooks *k k'* are pivotally connected with the bow and are so arranged that they may engage in holes *f* in the arm. The hooks *k k'* are in separate 40 parts and each in the shape of a bent lever, the one end of which constituting the hook itself and the other end being flattened and directed backward. Between the latter ends of the two hooks there is a little rubber air- 45 ball *p*, from which passes a tube *p²* along the treadle, down to the center of this, and further along the parts B, C, and D of the frame to a rubber air-ball *p³*, placed at the handle E. 50 The hooks at the one treadle are in this way, by means of a tube, connected with a rubber air-ball at the one handle, and the hooks at

the other treadle are in the same way, by means of another tube, connected with another rubber air-ball, being at the other handle E. As the tube is elastic it does not 55 prevent the movement of the bow upward or downward along the arm *a*. The latter is at the back provided with holes *f* for the hooks *k k'*. When pressing the air-ball *p³*, which 60 may easily be effected by means of the thumb when grasping the handle in the usual way, the air-ball *p* swells, thus causing the hooks *k k'* to move toward each other, (toward the arm *a*.) A spring *p⁴* holds, when the air-ball 65 *p³* is not actuated, the hooks distended, thus preventing them from getting spontaneously into the holes of the arm *a*. If wanted to move the bow *i* downward on the arm *a*, the air-ball *p³* has to be compressed when the 70 treadle is occupying its lower position. The air-ball *p* then swells, causing thus the hooks *k k'* to move toward the arm *a*. The downmost hook gets then into one of the holes *f* of the arm, while the topmost one only rests 75 against the arm, as there is no hole opposite it. (See at A' in Fig. 2.) When the arm is then swinging to the right, the hook *k'* sticks to the arm *a* and the bow *i* swings over the next lower elevation *d*. 80

At A, Fig. 2, where the arm *a* is represented in a middle position, the bow is shown swung half-way over the elevation *d*. Before the treadle has reached its upper position and before the arm *a* is thus at the right turning- 85 point at A², Fig. 2, the pressure upon the air-ball *p³* ceases. When the arm is then turning and going back to the left, the hook *k'* is releasing the arm *a*, but by means of a repeated pressure upon the air-ball *p³* when 90 the arm attains the extreme position to the left it may be caused to engage anew with the arm, the result of which being the moving downward of the bow one step, and so on.

If wanted to move the bow *i* upward on the 95 arm *a*, the air-ball *p³* has to be compressed when the treadle is raised. The arm *a* is then at A², Fig. 3, and in the said figure it is seen how the hook *k* is engaged in one of the holes *f* of the arm. When the arm is then swing- 100 ing to the left, Fig. 3, the bow *i* moves upward one step in the same way as described before with respect to the moving downward of the bow. At A and A' the position of the

hooks is shown when the readjusting device is not actuated. When the readjusting device is equal to both the treadles, and each treadle being provided with its separate air-
5 ball p^3 , the bows i may thus be readjusted on the arms a by compressing alternately the air-ball p^3 , according as the treadles arrive at the lower or the upper turning-point, depending upon whether the bows are to be moved
10 downward or upward.

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

1. In combination in a vehicle, the ratchet
15 drive-wheel, the chain, the treadle, the adjustable connection between the treadle and chain comprising the rack on the treadle-arm and the traveling bow and pawl and means for controlling the said adjustable connection comprising the air-bulb at the pawl to
20 move the same and to travel therewith, the

air-bulb within reach of the rider, and the air-pipe between the said bulbs the said air-pipe allowing the pawl to travel along the treadle-arm, substantially as described. 25

2. In combination in a ratchet driving-gear for vehicles, the drive wheel and chain, the treadle-arm, the adjustable connection between the same and the chain comprising the rack, the traveling bow and the double pawl
30 and means for controlling the double pawl consisting of the air-bulb interposed between the parts thereof, the air-bulb within reach of the rider and the pipe connecting the air-bulbs, substantially as described. 35

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

FREDRIK LJUNGSTRÖM.

Witnesses:

ERNST SVANGVIST,
CARL TH. SUNDHOLM.