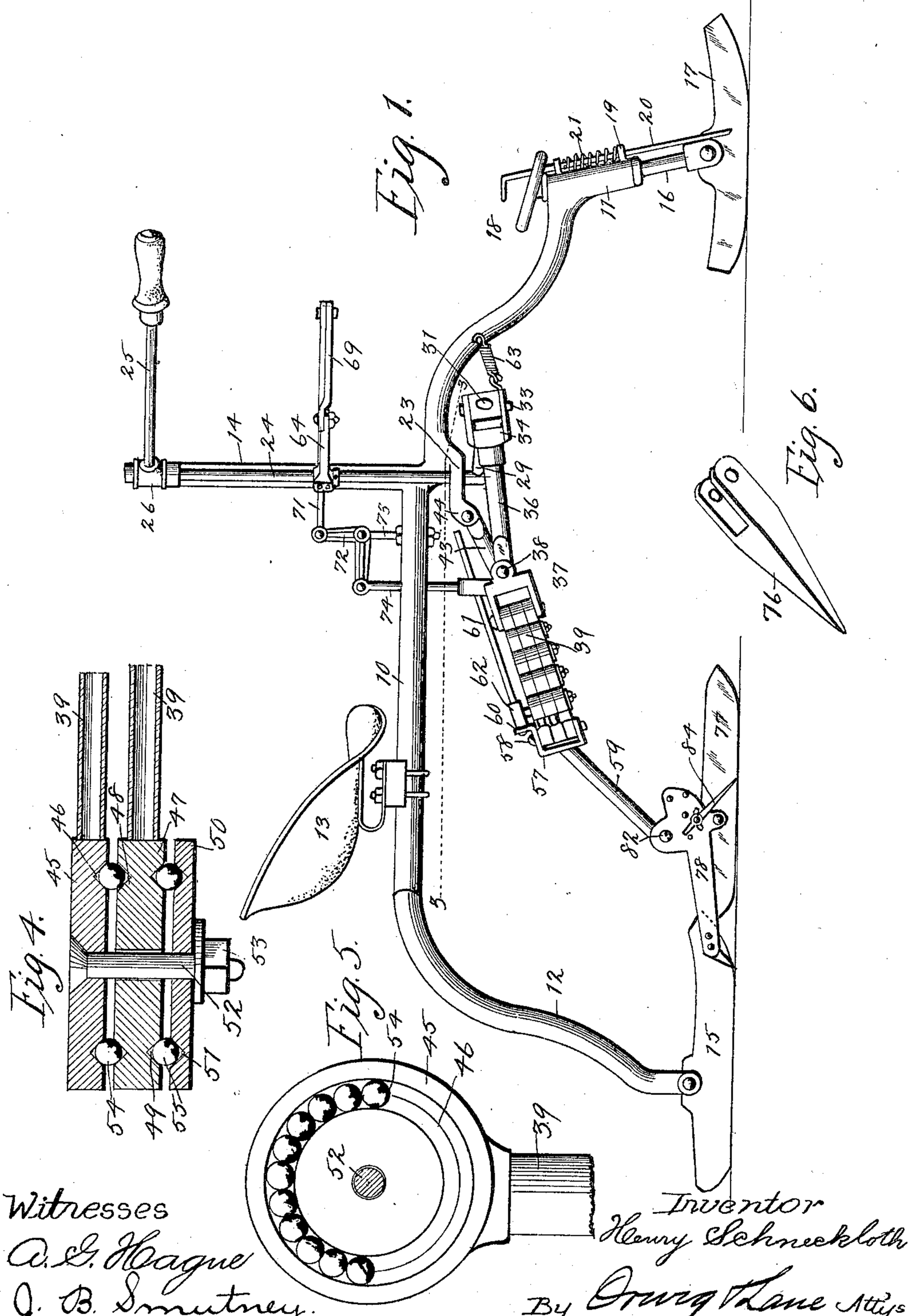
No. 813,025. PATENTED FEB. 20, 1906.

H. SCHNECKLOTH.

ICE VELOCIPEDE.

APPLICATION FILED OCT. 17, 1904.

3 SHEETS—SHEET 1.



Witnesses
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Inventor
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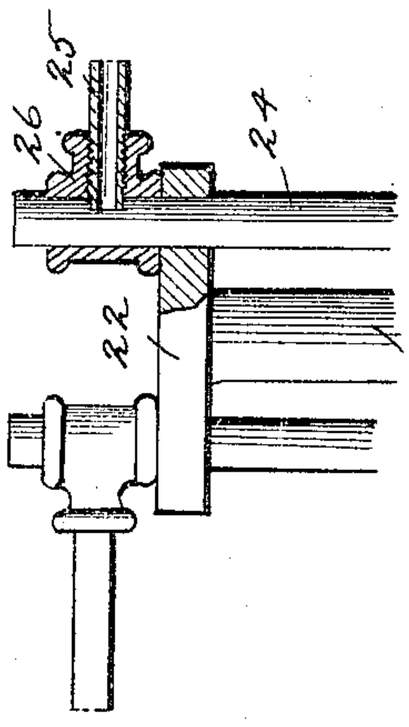

Fig. 4.

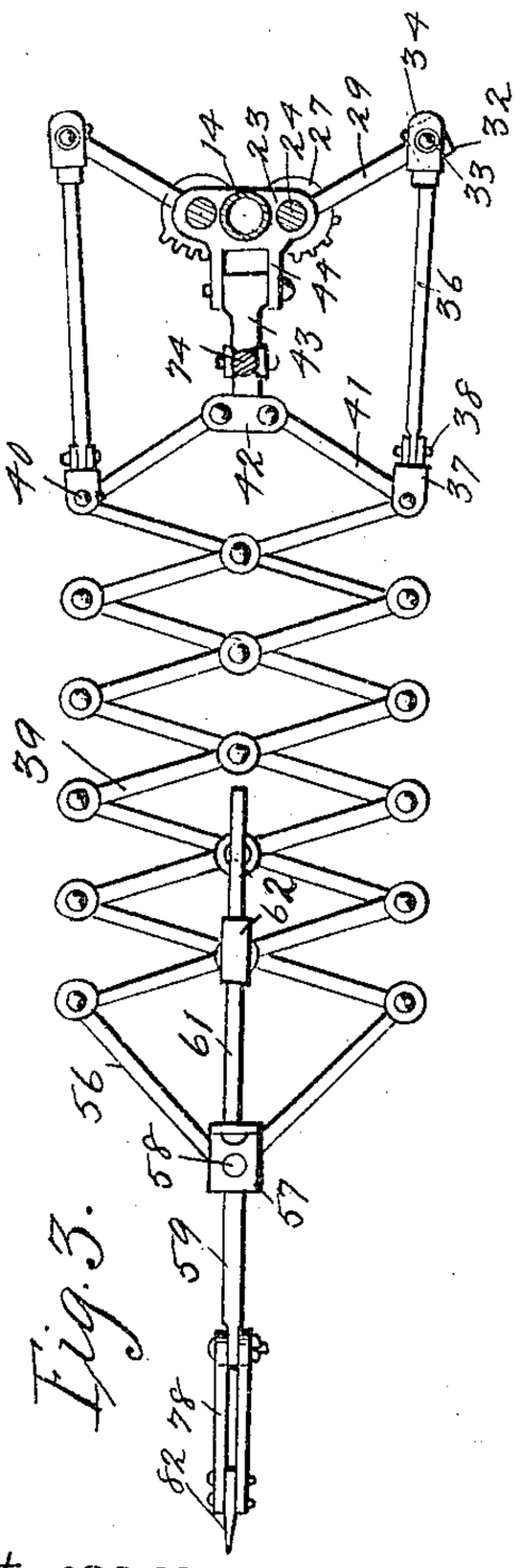

Fig. 3.

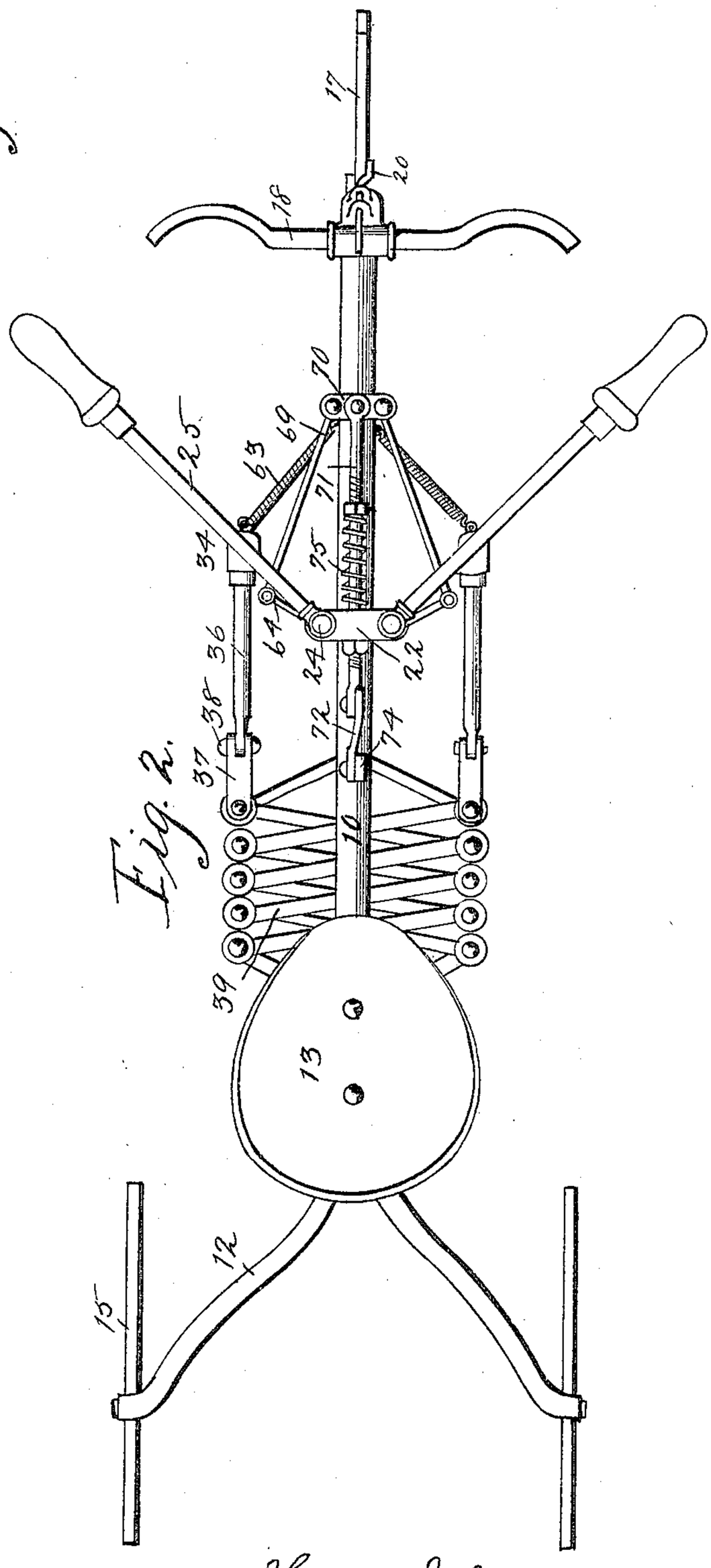

Fig. 2.

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3 SHEETS—SHEET 3

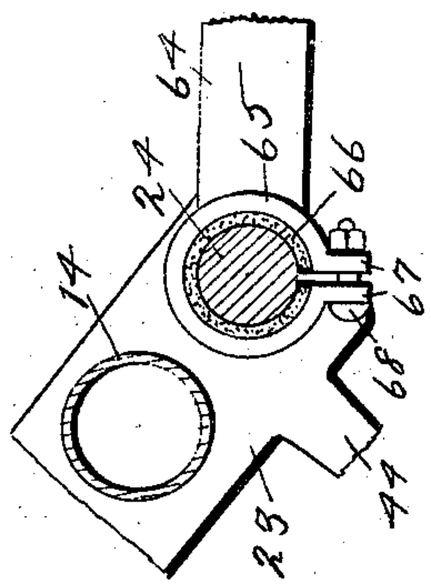

Fig. 12.

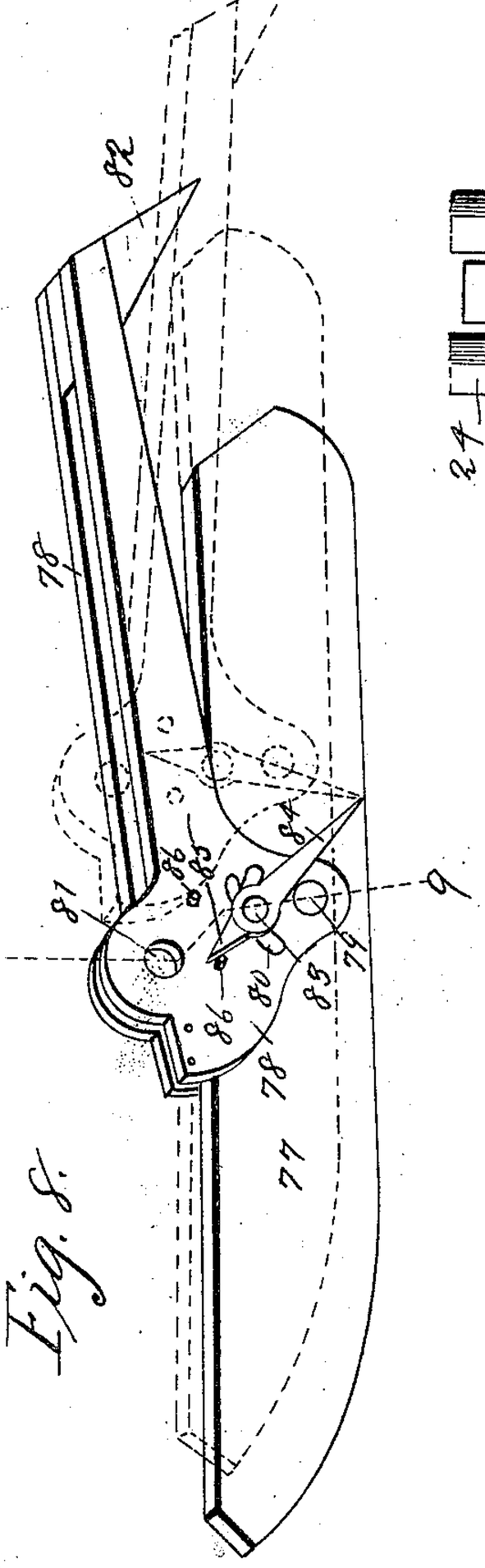

Fig. 8.

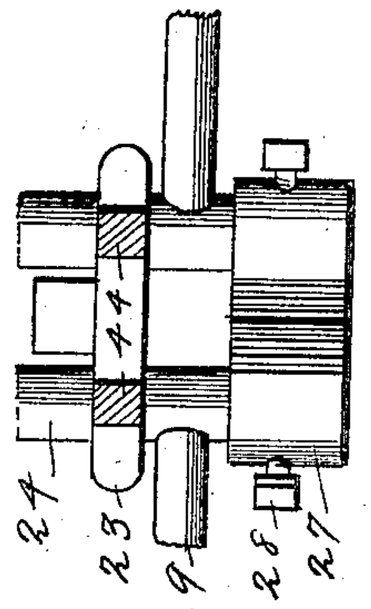

Fig. 13.

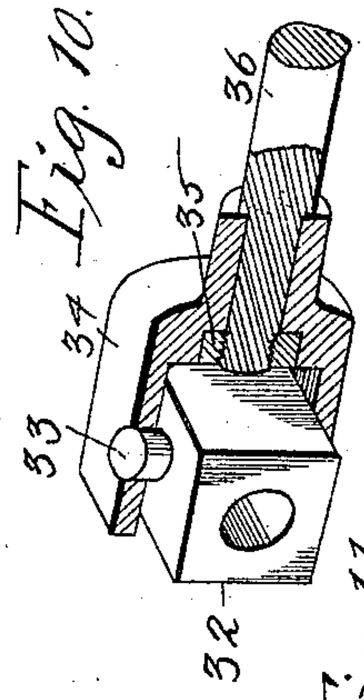

Fig. 10.

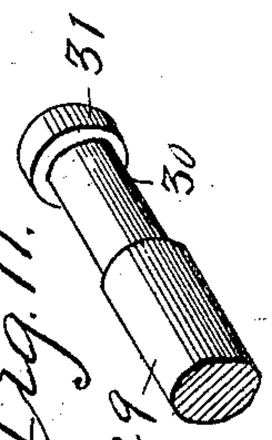

Fig. 11.

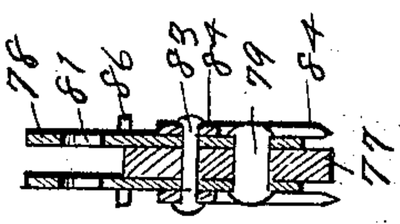

Fig. 9.

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UNITED STATES PATENT OFFICE.

HENRY SCHNECKLOTH, OF HOLSTEIN, IOWA.

ICE-VELOCIPEDE.

No. 813,025. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed October 17, 1904. Serial No. 228,696.

To all whom it may concern:

Be it known that I, HENRY SCHNECKLOTH, a citizen of the United States, residing at Holstein, in the county of Ida and State of Iowa, have invented a certain new and useful Ice-Velocipede, of which the following is a specification.

The objects of my invention are to provide a machine of this kind of simple, durable, and inexpensive construction to be operated manually and to utilize the power applied by the operator in a manner to obtain a maximum amount of forward movement with a minimum of applied power.

My invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the complete machine. Fig. 2 shows a top or plan view of same. Fig. 3 shows a sectional view on a line below the top bar of the machine-frame to illustrate the propelling device. Fig. 4 shows a detail sectional view of one of the joints of the lazy-tongs lever. Fig. 5 shows a plan view of the end of one of the lazy-tongs levers. Fig. 6 shows a detail perspective view of a modified form of sharpened projection for engaging the surface of ice for propelling the machine. Fig. 7 shows a detail view, partly in section, illustrating the means for connecting the operating-handles to the vertical shafts. Fig. 8 shows a perspective view of the runner for engaging the surface of the ice and the lever thereon provided with a projection for use in propelling the machine. The dotted lines in said figure illustrate the position of the device when the lever is at its lower limit of movement. Fig. 9 shows a sectional view on the line 9 9 of Fig. 8. Fig. 10 shows a detail perspective view illustrating the joint connecting the arm of the vertical shaft with the rod that imparts motion to the propeller. Fig. 11 shows a perspective view of the end of the arm that imparts motion to the propeller, which end connects with the joint illustrated in Fig. 10. Fig. 12 shows a detail sectional view illustrating the means by which the arms that actuate the propeller-elevating device are connected with the vertical shaft, and Fig. 13 shows a detail view illustrating the means for connecting and supporting the lower ends of the vertical shafts.

Referring to the accompanying drawings, I have used the numeral 10 to indicate the arched back of the machine-frame, preferably made of a metal tube. At the forward end thereof is a steering-head 11 and at the other end is the rear fork 12. Mounted upon the part 10 is a seat 13, and a short distance in front of the seat is a tubular upright 14. Pivoted to the ends of the rear fork 12 are the runners 15, and mounted in the steering-head 11 is the upright rod 16, having the runner 17 pivoted at its lower end and having the cross-head 18 fixed to its upper end above the steering-head and shaped to receive the operator's feet, so that the vehicle may be steered by the feet of the operator. Formed on the steering-head 11 are the lugs 19, in which is slidably mounted the brake-rod 20. A spring 21 is mounted upon the brake-rod between the lugs to normally hold the brake-rod elevated. The upper end of the brake-rod projects to a position where the operator may readily place his foot thereon, so that the brake-rod may be pushed downwardly to engage the surface upon which the runner 17 rests.

I have provided the following means for propelling the velocipede: At the top of the upright 14 is a cross-head 22, and at the bottom of the upright 14 is a cross-head 23. Mounted in these cross-heads on opposite sides of the upright 14 are two parallel vertical shafts 24. An operating-handle 25 is attached to the upper end of each of the vertical shafts 24 by being screwed into a T 26, which T rests upon the top of the cross-head 22. At the lower end of each vertical shaft 24 is a pinion 27, said pinions secured to the shafts by the set-screws 28 and arranged in mesh with each other, so that the vertical shafts are rotated in unison. At the lower end of each of the vertical shafts 24 is an arm 29, projected outwardly therefrom and formed with a journal 30 at its outer end portion and a head 31 beyond the journal. This journal is inserted in a block 32, provided with an opening to receive it, and said block is provided with a vertical opening intersecting the opening to receive the journal, said vertical opening designed to receive a pin 33. This block 32 is inserted in a yoke

34, having an opening large enough to permit limited movement of the block on the pivot-pin 33, which pin passes through the yoke. On the interior of the yoke is a screw-threaded nut 35, and an arm 36 is inserted in the yoke and screwed into said nut. In this way the arm 29 is connected with the arm 36 in such a manner as to permit a limited universal movement between said parts. At the rear end of the arm 36 is a yoke 37, to which the arm 36 is pivoted by the pin 38.

The numeral 39 indicates a lazy-tongs lever. The lever members at the opposite sides of the front end are inserted between the yokes 37 and pivotally connected therewith by the pivot-pins 40. Connected with the same pivot-pins are two short levers 41, extending forwardly and toward each other and pivoted to a plate 42. These levers 41 incline away from the adjacent lever members of the lazy-tongs lever at slightly greater angles than the lever member of the lazy-tongs lever proper incline relative to each other. The plate 42 is connected with a link 43, which in turn is pivoted between the lugs 44 at the rear of the cross-head 23. The rear end of the link 43 is permitted to move up and down, but prevented from moving laterally by the lugs 44 by the arrangement of the parts just described. A rearward movement imparted to the operating-handles will cause the lazy-tongs lever to be moved to its extended position, and a forward movement of the handles will bring the lazy-tongs lever to its folded position. The lazy-tongs-lever members 41 will prevent the rear end of the lazy-tongs lever from swinging laterally, and on account of the difference in the inclination of the members 41 and the other members of the lazy-tongs lever it is easier to start the extending movement of the lazy-tongs lever than if the members 41 were parallel with the other members. Furthermore, by the arragement of the parts connecting the arms 29 with the lazy-tongs lever the lever may be swung up and down and may be extended or folded readily when at any position of its swinging movement. In this connection I have provided an improved ball-bearing joint for connecting the joints of the lazy-tongs levers, as follows: The levers proper are preferably of tubular construction, and on the upper member at the joint is a disk 45, formed with an annular groove 46 on its under surface and with a concentric opening. On the other member at the joint is a disk 47, formed with a ball-bearing groove 48 in its upper surface and a ball-bearing-groove 49 in its under surface and also formed with a central opening. Beneath the disk 47 is a third disk 50, not connected with either of the lever members and formed with a ball-bearing groove 51 in its top and with a central opening. A bolt 52 is provided to connect these disks and is passed through the central openings of them, and a nut 53 is provided at the lower end of the bolt. A set of bearing-balls 54 is placed between the grooves 46 and 48. In this way the lever members are firmly held in the same plane and yet the members may move relative to each other with a minimum of friction. At the rear end of the lazy-tongs lever are two lever members 56, projected rearwardly and toward each other at angles which incline away from the adjacent lazy-tongs-lever members greater than the other lazy-tongs members incline relative to each other, and they are pivotally connected at their rear ends to the yoke 57 by means of the pivot-pin 58. Fixed to the yoke 57 is a rod 59, projecting downwardly and rearwardly. The device for engaging the surface over which the vehicle travels is pivoted to this rod 59 and will be described in detail hereinafter. On top of the yoke 57 is a lug 60, and a guide-rod 61 is fixed thereto and extends straight forwardly over the center of the lazy-tongs lever. Mounted upon the central portion of two of the cross members of the lazy-tongs lever is a guiding-cyinder 62, having said guide-rod 61 slidingly mounted in it. By means of the said guide, comprising the rod 61 and the cylinder 62, the rod 59 is firmly held in line with the center of the lazy-tongs lever, and the movement to extend and fold the lazy-tongs lever is not impeded.

I have provided means for automatically folding the lazy-tongs lever, as follows: Fixed to the forward ends of the yokes 34 are the contractible coil-springs 63, extended forwardly and inwardly and attached to the frame member 10. These springs are of sufficient resiliency to throw the lazy-tongs lever to its folded position when the operator releases the handles. I have also provided means by which the rear end of the lazy-tongs lever is forced downwardly at the commencement of its extending movement and is forced upwardly at the commencement of its folding movement, so that the means for engaging the surface over which the vehicle is traveling will stand in contact with said surface only during the effective portion of the movement of the propelling device and will be held out of contact with the surface over which the vehicle is traveling when the propelling device is at rest.

The numeral 64 indicates an arm having at one end a clamp 65, designed to encircle one of the upright shafts 24. Between the clamp and the shaft is a yielding washer 66, and the clamp 65 is provided with lugs 67, held toward each other by a bolt 68. Pivoted to the outer end of the arm 64 is an arm 69. A similar device is attached to the other upright shaft 24, and the two arms 69 are pivotally connected to a plate 70. This plate 70 is moved forwardly and rearwardly in unison with the operating-handles. Attached to the plate 70 is a rod 71, extended rear-

wardly and pivoted to a bell-crank lever 72, which in turn is fulcrumed to a support 73 on the machine-frame. The other end of the bell-crank lever is pivoted to an arm 74, pivoted to the rear end portion of the arm 43. An extensible spring 75 is placed on the rod 71, with one end in engagement with the frame and its other end in engagement with a nut on the rod 71. Assuming that the handles 25 are moved rearwardly, they will carry with them the plate 70 and the rod 71, and this movement will compress the spring 75. The said rod 71 will operate upon the bell-crank lever 72, and this will force the rod 74 downwardly and cause the runner to be brought into engagement with the surface over which the velocipede is traveling, and it will stay in contact therewith during the entire rearward movement of the handles 25. In this connection it is to be noted that during part of this rearward movement of the operating-handles the arms 64 may slide relative to the shaft 24 on account of the yielding washers 66, as the rearward movement of the part 71 is limited by the runner striking upon the solid surface on which the vehicle is traveling. Then when the handles 25 have completed their rearward movement and are released they will be moved forwardly by the springs 63, and at the same time the rod 71 will be moved forwardly by the spring 75, the said spring being of sufficient resiliency to elevate the runner and its connected parts from the surface as soon as the lazy-tongs lever begins its folding movement. By means of these parts it is obvious that the runner is thrust into engagement with the surface at the commencement of its operative stroke and is elevated and held above the surface at the commencement of its return stroke. The spring 75 practically counterbalances the weight of the lazy-tongs lever and runner, and the movement of the arms 64 on the shafts 24 is limited in one direction by the runner striking upon the surface and in the other direction by a nut on the rod 71 striking the frame. In this connection it is to be noted that the lazy-tongs lever is normally held in its folded position by the springs 63.

The device at the end of the rod 59 for engaging the ice or other surface over which the vehicle passes may consist of a sharpened projection 76, such as shown in Fig. 6, which projection may be attached direct to the lower end of the rod 59. However, I prefer to use the device illustrated in detail in Figs. 8 and 9 and comprising a runner 77, pivotally mounted between the arms 78, which arms overlap the sides of the runner and are pivotally connected therewith by the pin 79. Above the pin 79 the arms 78 are provided with segmental slots 80, arranged concentric relative to the pin 79. The upper ends of the arms 78 are formed with openings 81 to receive a pin 82 for pivotally connecting them with the arm 59. The rear ends of the arms 78 project beyond the rear end of the runner 77, and a sharpened projection 82 is fixed between them, extending rearwardly and downwardly. Rotatably mounted in the runner 77 above the pin 79 is a pin 83, the ends of which project through the slots 80. Attached to the projecting ends of the pin 83 are the pointed levers 84, which levers project downwardly and are of such length that they will project slightly below the lower surface of the runner when in position at right angles to the longitudinal axis of the runner. On the upper end of each lever 84 is an extension 85, and fixed to the arms 78 are the limiting-pins 86. These parts are so arranged that when the runner 77 is resting upon the surface over which the vehicle is advancing and is being moved forwardly the lower ends of the levers 84 will strike the surface and will be moved rearwardly relative to the runner, thus moving the extensions 85 forwardly, so that they will strike the pins 86 with sufficient force to elevate the pointed projection 82 and hold it in its elevated position. Assuming, however, that the rod 59 is moved rearwardly and downwardly with considerable force, then it will slide the runner 77 rearwardly, and the lower ends of the levers 84 will enter the surface upon which they are resting and form a pivot-point upon which the levers 84 will turn until the extensions 85 strike the opposite set of pins 86 and result in forcing the pointed projection 82 downwardly and into the surface over which the vehicle is advancing. Hence when the runner 77 is being moved forwardly by the arm 59 the pointed projection will be held in an elevated position; but as soon as the arm 59 is forced rearwardly the pointed projection will be thrust into the surface, so that the vehicle may be pushed forwardly by the propelling mechanism.

In practical use the operator is seated in the seat 13 and his feet rest upon the steering-bar 18. The operator grasps the handles 25, and by moving them rearwardly the lazy-tongs lever is extended and the pointed projection carried at the rear end thereof is forced into the surface on which the device is resting and the vehicle is moved forwardly over the surface on which it is resting. By arranging a lazy-tongs lever that is susceptible of extending to a considerable degree in the rear of the machine—say, for instance, six feet—an operator upon the machine standing on relatively smooth ice may with a second operation of the handles give the machine a forward impetus sufficient to carry it on the runners a distance of more than a hundred feet. As soon as the thrusting movement is completed the operator permits the springs to return the handles and at the same time the rear end of the lazy-tongs lever is automatically elevated and held out of contact with the ice. When the vehicle is trav-

eling over ice, the operator may by rapid movement of the handles extend the lazy-tongs lever at such speed that the pointed projection will engage the ice and an additional forward impetus be given to the vehicle even when the vehicle is traveling at a high speed. Hence a relatively high speed may be maintained without a regular uniform working of the handles, as they need be operated only when the speed begins to decrease.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. The combination of a vehicle-frame, two shafts mounted in the vehicle-frame, means for jointly rocking said shafts, arms on the shafts, a lazy-tongs lever pivoted at one end of the machine-frame, means for connecting said arms with the lazy-tongs lever to extend and to fold the lazy-tongs lever when the shafts are rocked.

2. A vehicle-frame, two shafts mounted in the frame, pinions on the shafts in mesh with each other, operating-handles on the shafts, arms on the shafts projected laterally in opposite directions, rods pivoted to said arms, a lazy-tongs lever pivotally supported at one end on the vehicle-frame and having said rods pivoted thereto.

3. A vehicle-frame, two upright shafts in the frame, means for jointly rocking the shafts, arms projecting outwardly from the shafts in opposite directions, rods connected with said arms to permit limited, universal movement of the rods relative to the arms, a lazy-tongs lever pivoted at one end of the vehicle-frame and having said rods pivoted to the opposite ends of the lazy-tongs-lever members adjacent to the pivoted end thereof.

4. An ice-velocipede comprising an arched frame member, a rear fork, runners pivoted to the rear fork, a seat carried by the arched frame member, a steering-head at the front of the arched member, a rod mounted in the steering-head, a runner pivoted to the lower end of said rod, a steering foot-rest at the top of said rod, handle-levers supported between the foot-rest and seat and a propelling device operated by the handle-levers.

5. An ice-velocipede comprising an arched frame member, a rear fork, runners pivoted to the rear fork, a seat carried by the arched frame member, a steering-head at the front of the arched member, a rod mounted in the steering-head, a runner pivoted to the lower end of said rod, a steering foot-rest at the top of said rod, handle-levers supported between the foot-rest and seat and a propelling device operated by the handle-levers, a brake-rod mounted on the steering-head susceptible of being pushed downwardly by the operator's foot to engage the surface on which the vehicle is resting and a spring for elevating it.

6. In a propelling device, a lazy-tongs lever having the lever members at one end pivoted together only at their ends, a pivoted arm connected to said lever members to pivotally support the lazy-tongs lever, arms pivoted to the outer ends of the lazy-tongs-lever members at the pivotally-supported end of the lazy-tongs lever and a sharpened projection carried by the other end of the lazy-tongs lever.

7. In a propeller, a lazy-tongs lever, the two members at one end thereof inclined toward each other and away from the adjacent members to greater degrees than the other lever members are inclined relative to each other, said end members pivotally supported at their ends and arms connected to the outer ends of the lazy-tongs-lever members.

8. In a propeller, two vertical shafts, arms fixed to the shafts and projected laterally in opposite directions, rods connected to said arms and capable of limited universal movement relative thereto, yokes pivoted to the other ends of said rods, a lazy-tongs lever having the lever members at one end pivoted in said yokes, lever members connected with said yokes extended forwardly with their ends adjacent to each other, an arm having said lever members pivoted thereto and means for pivotally supporting said arm to swing vertically.

9. In a lazy-tongs lever, the combination of a lazy-tongs member, a disk thereon having a central opening and a ball-groove on one surface, a second lever member having a disk thereon provided with a central opening and ball-grooves on both surfaces, a third disk having a central opening and a ball-groove on one surface, a bolt passed through the said central openings and bearing-balls in said grooves.

10. The combination of a runner, an arm pivoted to the runner, a pointed projection carried by the arm, said arm formed with a slot concentric to its pivot-point, a reciprocating rod connected to the arm above its pivot-point, limiting-pins fixed to the arm and a short shaft mounted in the runner projected through the slot of the arm, a lever fixed to said shaft one end of a length to project below the runner and when swung to a rearward inclined position elevating the arm by engaging the limiting-pin and when swung to its other position lowering the rear end of the arm by engaging the other limiting-pin.

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