(No Model.) 3 Sheets—Sheet 1.

S. SMITH.

BICYCLE.

No. 382,913. Patented May 15, 1888.

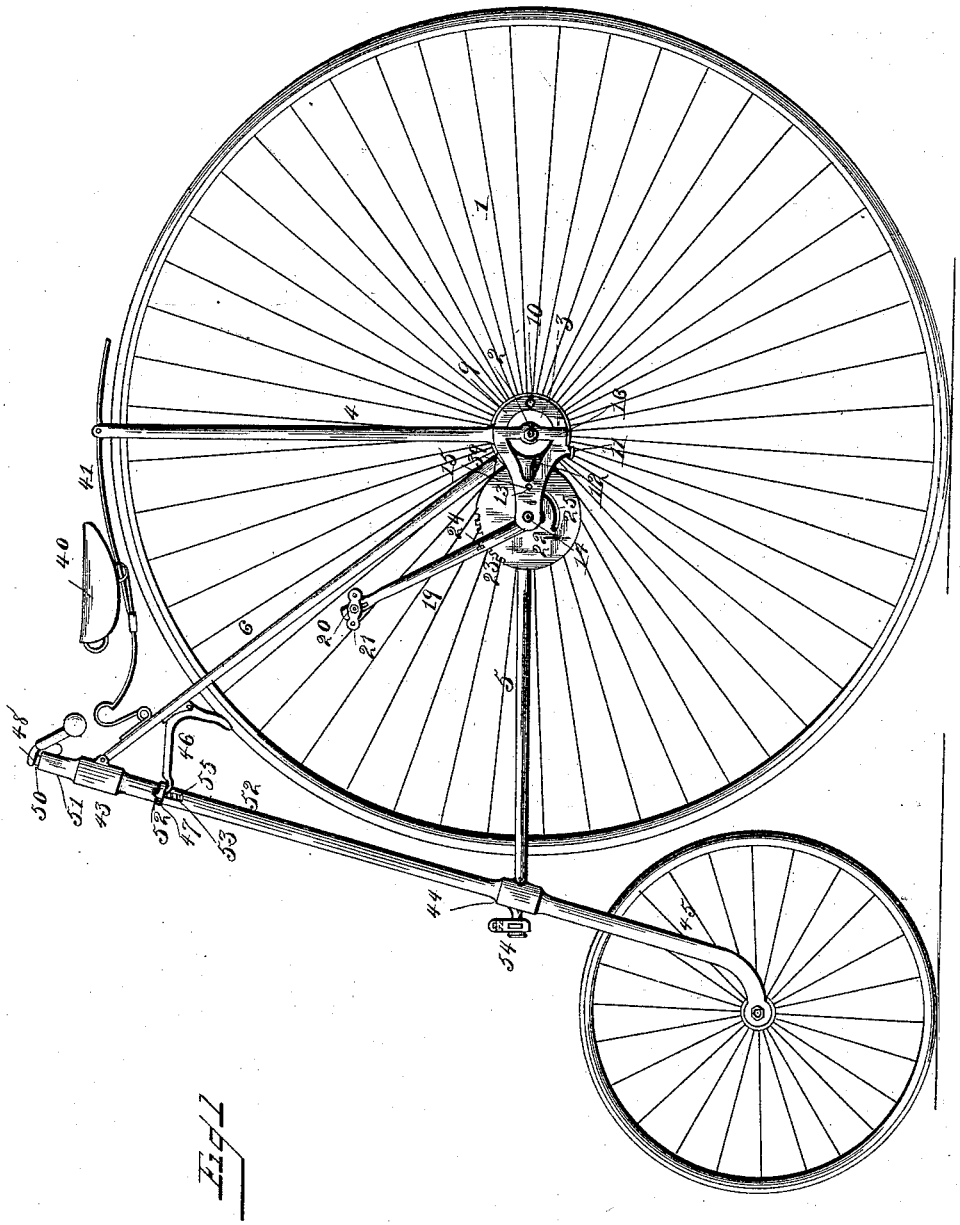

Fig. 1.

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Fig 2

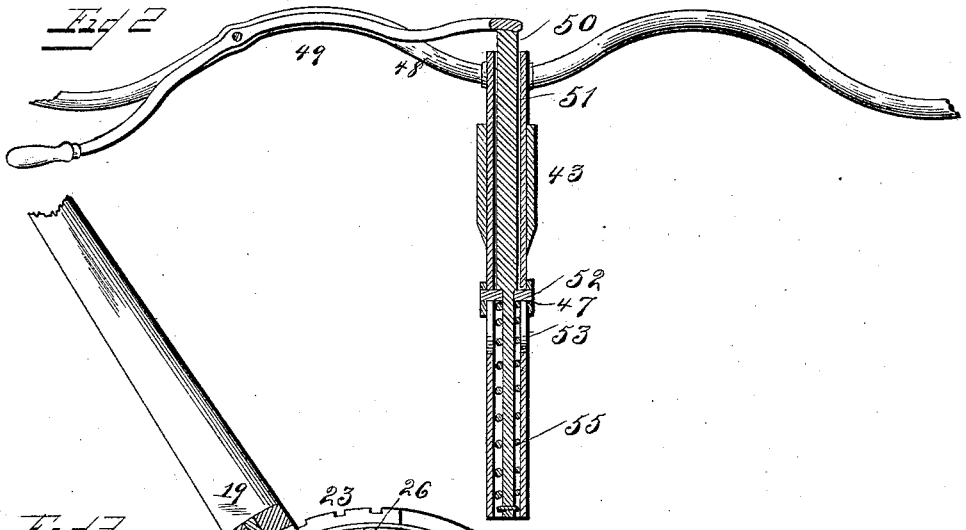

Fig 3

Fig 4

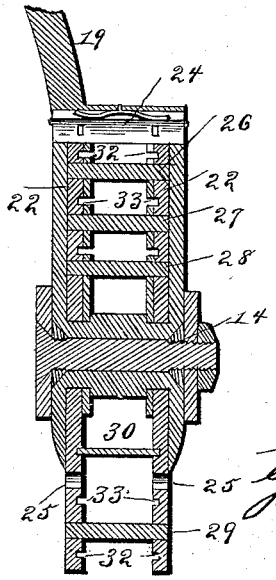

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Fig 5

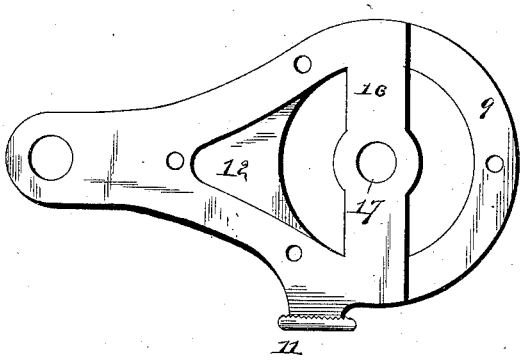


Fig 6

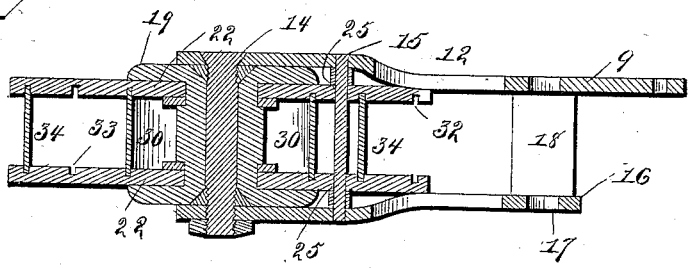
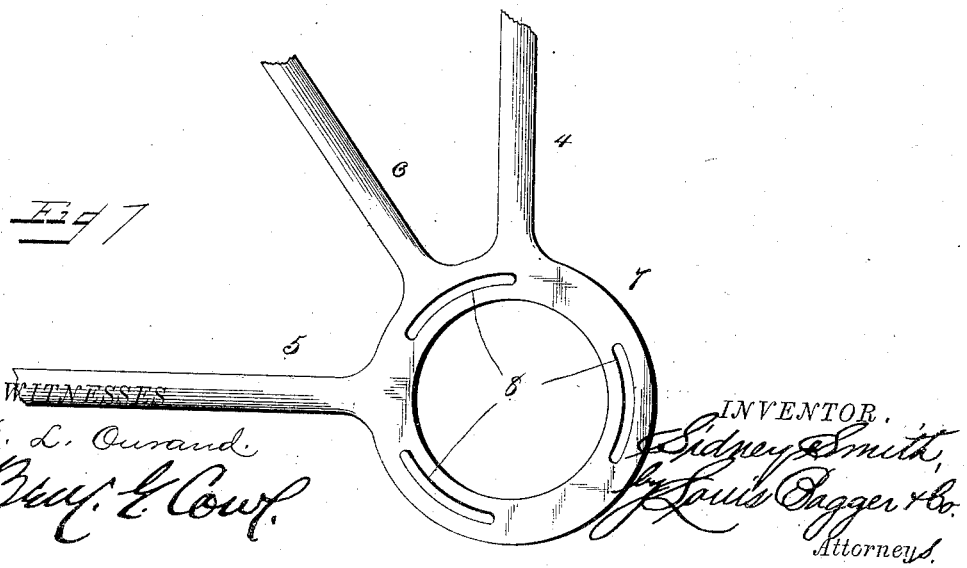


Fig 7



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UNITED STATES PATENT OFFICE.

SIDNEY SMITH, OF PINE BLUFF, ARKANSAS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 382,913, dated May 15, 1888.

Application filed January 18, 1888. Serial No. 261,089. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY SMITH, a citizen of the United States, and a resident of Pine Bluff, in the county of Jefferson and State of Arkansas, have invented certain new and useful Improvements in Bicycles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side view of my improved bicycle. Fig. 2 is a transverse vertical sectional view through the steering-head. Fig. 3 is a side view of the driving-gear, showing one side of the frame and one side of the casing of the foot-lever removed. Fig. 4 is a vertical sectional view of the casing of the foot-lever, looking toward the front of the machine. Fig. 5 is a side view of the frame supporting the lever-casing. Fig. 6 is a horizontal sectional view of the frame and of the casing, and Fig. 7 is a side view of the part of the machine-frame to which the frame supporting the lever-casing is secured.

The same numerals of reference indicate the same or corresponding parts in all the figures.

My invention has relation to that class of bicycles in which the drive-wheel is revolved by a strap wrapped around the ratchet-casing upon the shaft of the wheel, and in which this strap is drawn out and unwound from the ratchet-casing by depressing a foot-lever or pedal and is again wound up on the casing by a spring within the latter; and it consists in the improved construction and combination of parts of such a bicycle, as hereinafter more fully described and claimed. In bicycles or other velocipedes of this class, and more especially in the so-called "Star" bicycle, which at present is about the only practical machine of this kind, the gearing will only admit of two adjustments—one for speed and the other for power; but it is often desirable to have the levers so arranged and their connecting-gearing so constructed that the gearing may be adjusted for speed, for moderate speed and power, and for power, which adjustments I have accomplished by my improvement. It is likewise often desirable to have the levers supported adjustably, so that they may be brought to stand at the height most suitable for the rider, admitting of the stroke being finished, and this is accomplished by securing the frame supporting the levers and their gearing adjustably upon the machine-frame. The brake-operating mechanism is likewise so constructed that it may operate the brake at any position of the steering head and wheel, and the saddle and supporting-frame is so arranged that the rider will sit at the most advantageous place and will be easily and smoothly supported.

I shall now proceed to describe the specific construction of the parts of the machine, referring by numerals to the accompanying drawings, in which—

The numeral 1 indicates the drive-wheel, which is of the usual construction, and has its axle or shaft 2 projecting through the closed heads of the cylindrical ratchet-boxes 3 or clutch-boxes, which boxes may contain the ratchet or clutch mechanism of any suitable construction.

The frame of the machine consists of a pair of vertical rods, 4, a pair of horizontal rods, 5, and a pair of upwardly and forwardly inclined rods, 6, all of which rods project radially from circular frames, 7, having three (more or less) segmental slots, 8, in them and surrounding the ratchet-boxes.

A circular frame, 9, is secured to the circular central frame by means of nutted bolts 10, passing through the slots, and this frame is provided with a step, 11, at its under side, and with a forwardly-projecting arm, 12, which is connected to a similarly-shaped arm, 13, by means of a larger bolt, 14, between the outer ends of the arms and a smaller bolt, 15, between the inner portions of the arms, and by means of a vertical and diametrical bar, 16, extending between the rear ends of the bifurcated rear portion of the arm, having a central perforation, 17, into which the nutted end of the shaft or axle of the drive-wheel is secured, the upper and lower ends of this bar being connected to the upper and lower edges of the circular frame by means of short bars 18.

The foot-levers 19 are pivoted with their inner bifurcated ends upon the bolts between the forward ends of the arms, and the outer

ends of the levers are formed, preferably, with a series of perforations or a slot in which the bolt 20 of the pedal 21 may be adjusted. The inner bifurcated end of each of the levers straddles two disks, 22, journaled upon the central bolt, and the upper edges of these disks are preferably formed with notches or cogs 23, which may be engaged by a spring-bolt, 24, in the upper united portions of the bifurcated ends of the lever, so that the lever may be adjusted by means of this bolt and the cogs or notches to stand at various angles. The disks are formed at their lower rear portions with segmental slots 25, extending, preferably, for about ninety degrees and registering with each other, and the disks slide with these slots upon the bolts 15, connecting the arms of the frame, the bolt and the slots thus limiting the play of the disks upon the central bolt. The disks are united by three bolts, 26, 27, and 28, secured with their ends in the disks in a radial line upward, and by a diametrically-opposite bolt, 29, and a small cylinder, 30, having a slot, 31, above the innermost bolt of the three, serves, furthermore, to connect the disks, being secured with its edges in the inner faces of the disks. The inner faces of the disks are formed with two circular grooves, 32 and 33, both grooves slightly outside of the two outer bolts, 26 and 27, and semicircular plates or bars 34 slide with their edges in these grooves and have at one end hooked arms 35, for engaging the bolts, and at the other end a perforation, 36, which may be engaged by a pin, 37, upon the inner end of the drum-strap 39, which strap is provided at its free end with hooks 38, for engaging one of the bolts connecting the disks.

It will now be seen that if the semicircular plates are slid into the forward halves of the grooves and their hooks are slipped over their corresponding bolts the hooked end of the drum-strap may be hooked over the inner bolt, giving the power exerted upon the outer end of the foot-lever considerable leverage upon the strap, so that by this adjustment power is increased, but at the cost of speed, as usual. When the semicircular plate is slid around in the inner groove, bringing it between the rear halves of the disks, the hooked end of the drum-strap is hooked upon the second bolt, and the pin in the drum-strap will engage the perforation in the end of the plate, causing the strap to be wound upon the same, and in this case moderate power will exert moderate speed; but when the outer semicircular plate is similarly adjusted and the strap secured to it the strap will wind upon a plate of still greater diameter, causing a quicker unwinding of the drum-strap from the drum, but at the same time requiring a greater exertion of power upon the lever.

The saddle 40 is secured upon a spring, 41, secured between the upper ends of the vertical rods of the frame and the forwardly-inclined rods, and the steering-rod 42 is journaled in bearings 43 and 44 in the ends of the upwardly-inclined rods and in the ends of the horizontal rods, having the fork 45 straight with it and formed with the lower ends slightly curved forward.

The brake 46 is fulcrumed between the upper ends of the forwardly-inclined rods, and has the bifurcated end of its outer arm straddling the steering-rod, and the inner end of the brake-handle 48, which is pivoted upon one of the handle-bars 49, is pivotally connected to the upper end of a rod, 50, sliding in the upper tubular portion, 51, of the steering-rod and having a cross-head, 52, at its lower end, which slides in vertical slots 53 in the said rod, and has a ring, 47, secured to its ends, adapted to depress the end of the brake-arm when the sliding-rod is depressed, a spring, 55, within the hollow steering-rod holding the sliding rod and ring normally out of contact with the arm of the brake.

The lamp 54 is preferably secured at the bearing 44 for the steering-rod, being thus supported immediately above the steering-wheel.

By having the saddle supported between the center of the drive-wheel and the steering-wheel it will afford an easy seat for the rider, and, the steering-rod being vertical, or nearly so, the machine will steer easily and without any danger of the steering-wheel being turned to the side by obstructions, and thus causing a fall.

The pedals may be adjusted upon the levers so as to admit of various leverage, the drum-strap may be adjusted to give three different adjustments of power and speed, and the disks and the levers may be raised or lowered, according to the length of the rider's legs, by loosening and securing the nutted bolts in the segmental slots of the circular frame, the levers being adjusted to the proper angle for work after the disks have been lowered or raised by adjusting the bolts of the bifurcated ends in the notches or cogs of the edges of the disks.

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

1. In a bicycle, the combination of the central circular frame, 7, having segmental slots 8, the circular frame 9, having the forwardly-projecting arms supporting the foot-levers and the driving-gear, and the nutted bolts passing through the segmental slots and the circular frame, adjusting the latter, as shown, and for the purpose specified.

2. In a bicycle, the combination of a circular frame, 7, having segmental slots 8, the circular frame 9, having bolts 10 and arm 12, and provided with the cross-bar 16, having connecting-lips 18 and arm 13, connected by bolts 14 and 15 to the other arm, the drum or ratchet-box within the frame having the drum-strap, and the foot-lever having the disks formed with the segmental slots 25, and having the drum-strap secured between them, as shown, and for the purpose specified.

3. In a bicycle, the combination of the ad-

justable frame 9, having arms 12 and 13, the disks having the cogs or notches 23 and journaled between the ends of the arms, and the lever pivoted with its bifurcated inner ends straddling the disks upon the journal-bolt of the disks and having the spring-bolt engaging the cogs or notches, as shown, and for the purpose specified.

4. In a bicycle, the combination of the drum or ratchet-box, the circular frame surrounding the said box and having its cross-bar secured to the axle or shaft and formed with the forwardly-projecting arms connected by the journal-bolt 14 and the smaller bolt, 15, the disks 22, having the segmental slot 25 and journaled upon the journal-bolt, and formed with the bolts 26, 27, and 28, and bolt 29, and having the cylinder 30 and circular grooves 32 and 33 in their inner faces, the semicircular plates having the perforation and the hooked ends and sliding in the grooves, and the drum-straps secured to the drum and having the hooked end and the pin near the end, as shown, and for the purpose specified.

5. The combination of the steering-rod having the upper tubular portion provided with longitudinal slots in its sides, the brake-bar fulcrumed upon the handle-bar, the rod in the tubular portion of the steering-bar, having its upper end pivoted to the brake-bar and having the cross-head at its lower end sliding in the slots and the ring, the spring for holding the rod and ring up, and the brake having the bifurcated arm straddling the steering-rod and bearing against the under side of the ring of the cross-head, as shown, and for the purpose specified.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

SIDNEY SMITH.

Witnesses:
E. A. ALLEN,
K. A. ADAMS.