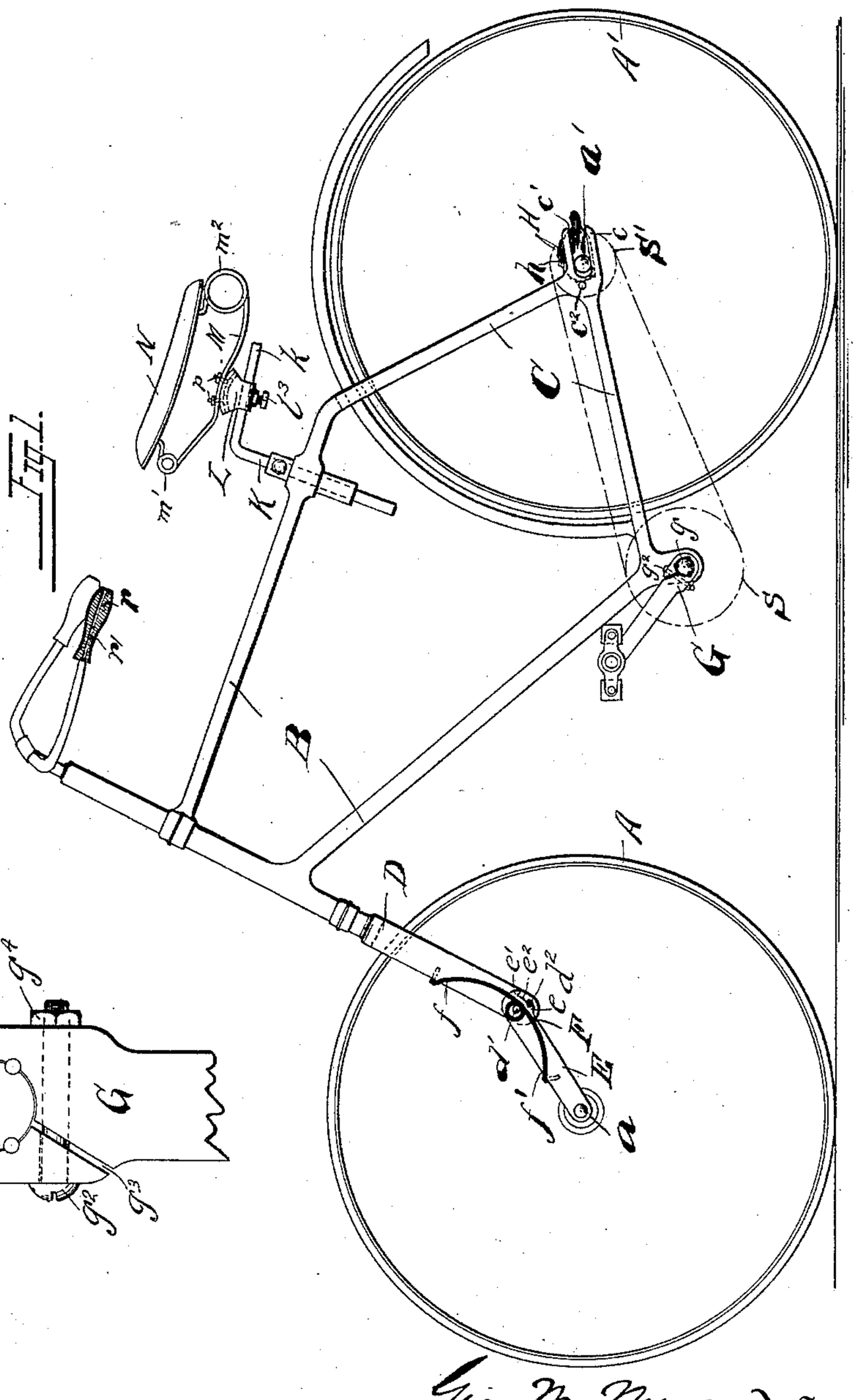
(No Model.) 2 Sheets—Sheet 1.

G. W. MEIGS & J. G. ZIEGLER.

BICYCLE.

No. 474,327. Patented May 3, 1892.



Witnesses
Ed. A. Foley
David Levan

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By their Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

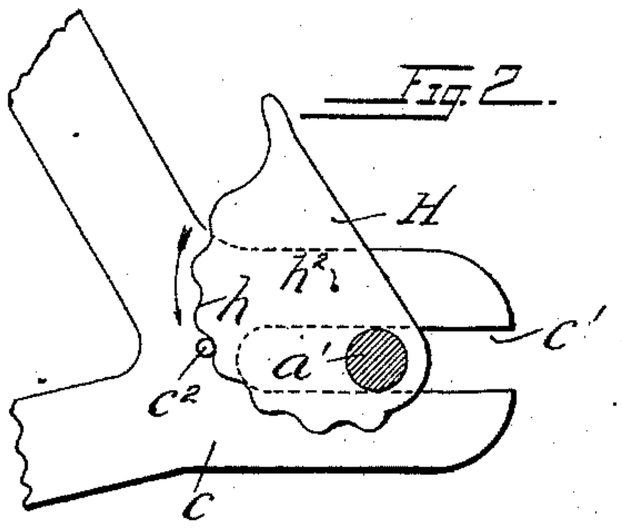


Fig. 3.

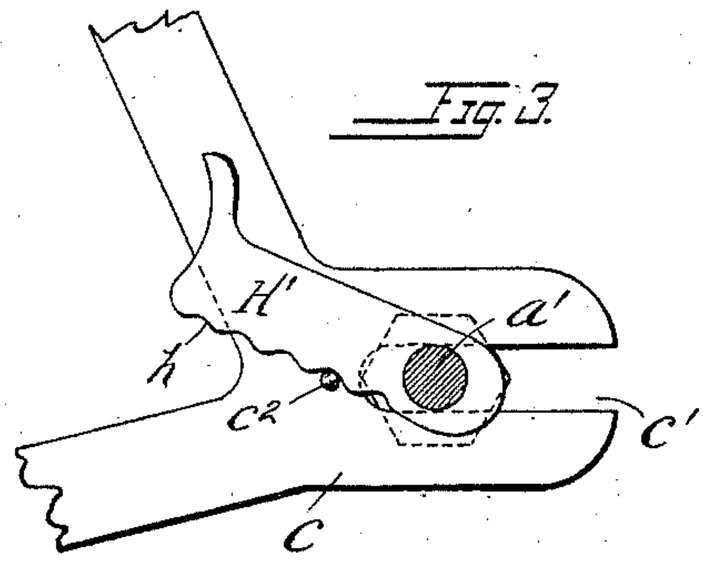


Fig. 4.

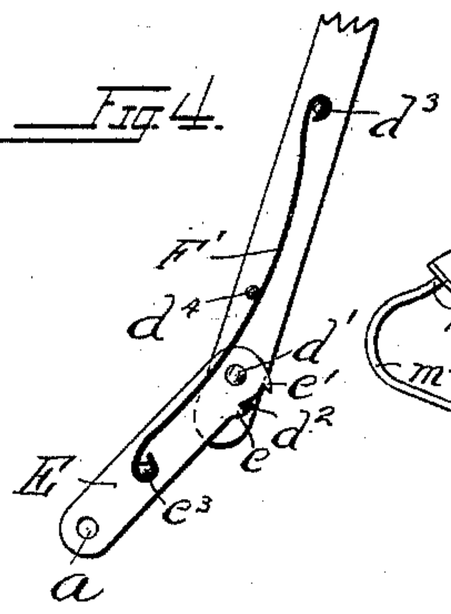


Fig. 5.

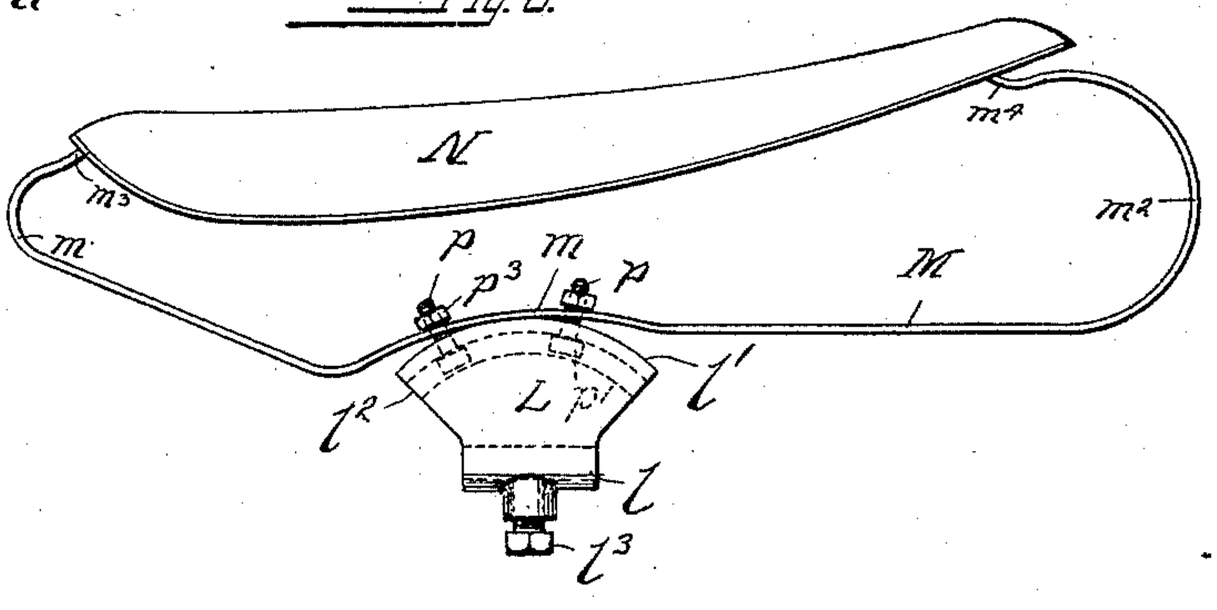


Fig. 6.

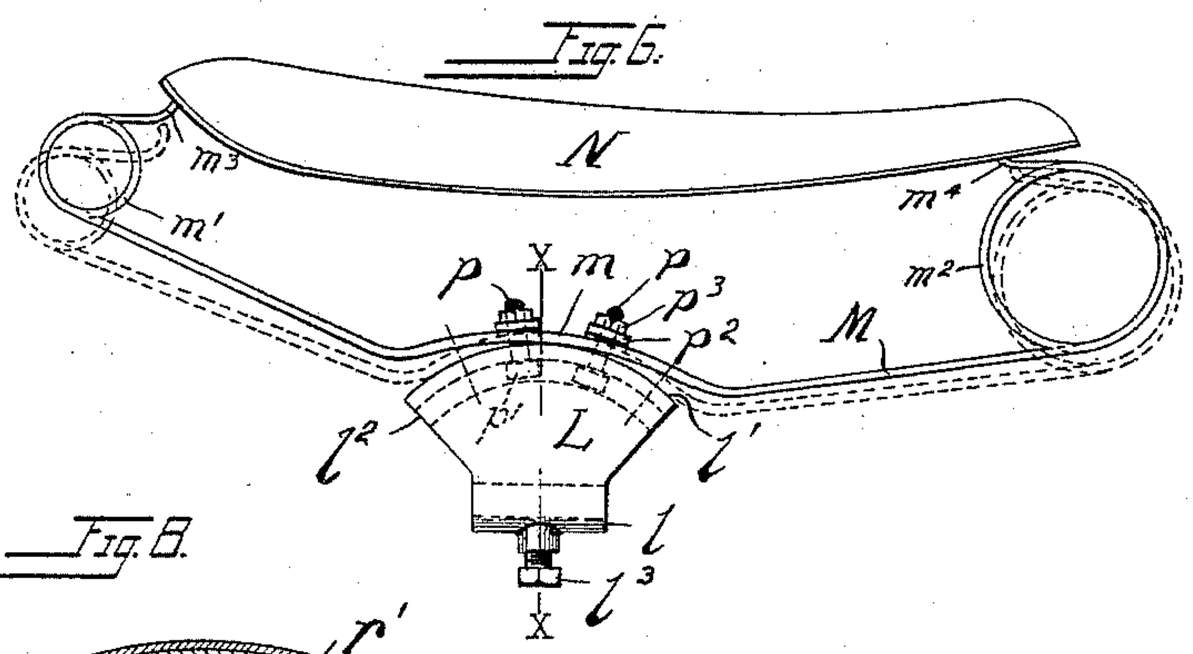


Fig. 7.

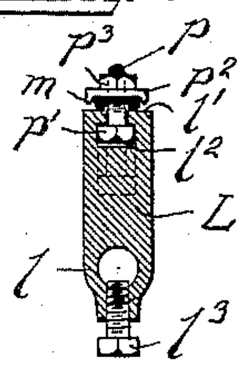
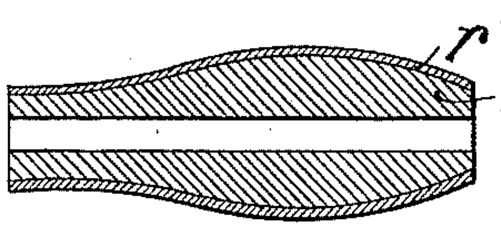


Fig. 8.



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} Inventors

By their Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. MEIGS AND JOHN GEORGE ZIEGLER, OF READING, PENNSYLVANIA; SAID MEIGS ASSIGNOR TO EDWARD E. ZIEGLER, OF PHILADELPHIA, PENNSYLVANIA.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 474,327, dated May 3, 1892.

Application filed May 29, 1891. Serial No. 394,485. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. MEIGS and JOHN GEORGE ZIEGLER, citizens of the United States, residing at Reading, in the county of Berks, State of Pennsylvania, have invented certain Improvements in Bicycles, of which the following is a specification.

Our invention relates particularly to bicycles; and it consists in certain improvements in details whereby the comfort and convenience of the user are enhanced, and the construction at the same time simplified and improved and the cost reduced.

These improvements are fully described in connection with the accompanying drawings, and are specifically pointed out in the claims.

Figure 1 is a side elevation of a Safety bicycle having our improvements adapted thereto. Fig. 2 is a detail view of the adjusting mechanism for the rear axle, and Fig. 3 is a modification of the same. Fig. 4 shows in detail our improved spring-fork provided with a slightly-modified form of spring. Figs. 5 and 6 are detail views of the saddle mechanism, showing the saddle adjusted to different positions on its stand and the manner of adjusting the tension upon the seat. Saddles of slightly-different construction are indicated in the two views. Fig. 7 is a cross-section through X X of Fig. 6. Fig. 8 is a detail view of the handle in cross-section. Fig. 9 is an enlarged view showing the pedal-crank connection.

The frame B of the machine may be of any ordinary construction, as also the front and rear forks D and C, except as to the means of connecting these forks to their axles a and a' of the front and rear wheels A and A′, respectively, which means are peculiar and advantageous in several important respects, which we will now describe. The branches of the front fork have heretofore been connected to the axle by means of links or hangers, the pivotal movement of which has been controlled by different forms of springs. In our construction, as shown in Figs. 1 and 4, the hangers E are pivoted at d' to the fork arms or branches, and a spring F on each side is fulcrumed about midway of its length, either to the projecting pivot-pin d', as in Fig. 1, or to a pin d^4 especially provided for it on the fork, as in Fig. 4, while the ends f and f' extend above and below the fulcrumed point and bear upon the fork branches, respectively, with a pressure tending to straighten the hangers to correspond with the center line of the fork. The angular position of the hangers, however, with respect to the fork is maintained at a minimum by an offset e on the hanger, which comes in contact with a stop-pin d^2, projecting from the fork below the pivot d'. Another offset e' is also provided on the hanger to limit its possible pivotal movement in the other direction, the edge e^2 of the hanger between the offsets being curved from the center d', as shown, so that the same stop-pin d^2 serves to limit the movement in either direction. This limitation of motion is decidedly advantageous both on account of maintaining the hanger at a proper angle, even when all weight is removed, and of limiting the maximum pivotal movement, whether due to mounting an obstacle or a broken spring. In the latter emergency the unbroken spring upon the opposite side can be easily removed, its attachment being entirely independent of other parts, and the mechanism can be operated in the same manner as though provided with a rigid fork. Moreover, it can be readily converted into a rigid fork connection whenever desired by removing the springs, which can be conveniently carried and replaced at any time.

In Fig. 4 the spring F′, instead of being made of wire coiled to engage the fulcrum-pin and having its ends bent to engage the edges of the fork branches and hangers, respectively, as shown in Fig. 1, is represented as formed of plate-steel having curled ends engaging projecting pins d^3 and e^3. Evidently, however, there is no substantial difference between the two forms of springs.

Referring now to the rear end of the machine, the driving-wheel A′ is rotated in the usual manner through the medium of cranks G, sprocket-wheels S and S′, and a chain connecting them. In order to take up the slack in the chain, which becomes necessary, owing to its gradual lengthening in service, the bearing ends c of the rear fork have been pro-

vided with slots c', in which the axle a' is supported, and means for adjusting the axle horizontally have been used. Heretofore, however, it has required considerable care and skill on the part of the operator to satisfactorily adjust the axle, owing to the evident necessity of setting it practically at right angles to the vertical plane of the machine-frame. Indeed the slightest variation from this true position is a great disadvantage, both in the operation and wear of the machine. The means of adjustment heretofore provided have been very unsatisfactory, because they do not provide for securing a positive parallel movement of the axle in tightening the chain.

Referring to Figs. 1 and 2, the arms H, of sheet metal and exactly similar in form, are secured eccentrically to the axle adjacent to each fork branch. The circular edges h struck from the center h^2 are preferably notched or serrated slightly, as shown, so as to engage pins c^2, projecting from the face of each fork branch. In order to move the axle and tighten the chain, the nuts on the ends of the axle are first loosened, as usual. The axle is then turned in the direction of the arrow and the contact of the edges h with the pins c^2 presses the axle backward uniformly at both ends until the slack in the chain is taken up, when the end nuts are again tightened, thus completing the operation without requiring any skill or any examination to determine the correctness of the adjustment, which is more perfect than is possible, even after exercising the greatest care and skill with the ordinary means.

The modified arms H′ (shown in Fig. 3) operate in substantially the same way as the eccentric arms H, except that the rearward movement of the axle is not effected by the act of turning it, as above described; but the axle is merely released by turning it sufficiently to lift the arms out of engagement with the pins c^2. The only care required with this construction is to see that the same notches h^2 in each arm engage the opposite pins. If the arms H or H′ be merely loosely strung on the axle, instead of being fastened, they may be moved out of or into engagement with the pins without turning the axle itself.

The saddle-supporting arm K with horizontal bend k is of a form ordinarily used and is provided with a sliding saddle-stand L, adjustably secured thereto, as usual, by means of a set-screw l^3. Heretofore rocking stands have been provided, by means of which the pitch of the saddle has been regulated, and the tension upon the perch or seat has been generally made adjustable by forming the spring-frame M of the saddle in two or more extensibly-connected parts.

In our machine both tension and pitch are regulated by the mere act of securing the saddle to the stand, owing to their peculiar construction. The spring-frame M of the saddle may be formed of a single plate of steel, as in Fig. 5, or of a single piece of round wire, as in Fig. 6, the front and rear ends m^3 and m^4 being in either case connected in any suitable manner to the seat N and curved or coiled, as at m' and m^2. The central portion m of the base, which rests upon the stand L, is preferably curved upward, as shown, but to a longer radius of curvature than the top face l' of the stand, so that the surfaces m of the saddle and l' of the stand are tangent to each other at a point which is shifted forward or backward on the surface l' of the stand as the pitch of the seat is changed. The portion m of the base, if a plate, is preferably slotted its whole length to permit the passage and adjustment of clamping-bolts p, the heads p' of which ride in the T-slot l^2 of the stand. If the base consists of two parallel wires, as in Fig. 6, the bolts p slide between them, and a washer p^2 is interposed between the nut p^3 and the wires. If the clamping-bolts be spread a considerable distance and the normal line of the base m be changed by tightening the nuts and forcing it to assume a form parallel with the curved surface l' of the stand, as indicated by dotted lines, it is evident that the ends which project beyond the stand will be depressed, as shown, thus tending to spread the ends m^3 and m^4 and placing a greater or less tension upon the seat N, varying with the spread of the clamping-bolts and consequent distortion of the normal shape of the base m. It will be readily understood that the pitch and tension may thus be simultaneously adjusted by merely rocking the saddle on the stand and properly spacing the clamping-bolts. The advantage of curving both the base and the supporting-surface of the stand is that the saddle is less likely to slip when clamped.

Another common source of inconvenience and trouble with bicycles and similar vehicles arises from the difficulty, with present means of attachment, of maintaining a perfectly tight connection of the pedal-crank with its shaft. To overcome this trouble, we construct and attach the crank G to the shaft g in the manner indicated in Fig. 9. The crank-hub is bored to a diameter somewhat larger than the shaft, and is slotted or split, preferably as shown at g^3, to permit the closure of the hub-bore by means of a somewhat loosely-fitting transverse bolt g^2. Instead of clamping the hub-bore tightly against the surface of the shaft, however, as is ordinarily done, we carefully avoid bringing the two surfaces in direct contact, but instead concentrate the whole clamping energy at the points g'. This we accomplish by correspondingly grooving the hub-bore and shaft longitudinally, as shown, and introducing pins g', which, while preventing contact of the hub-bore with the shaft, serve to effectually prevent the crank from turning thereon when the pins properly fill the grooves. This proper fit of the pins is readily secured at any time in our construction by drawing up the nut g^4, the whole

face of the clamping energy thus developed being expended at the points g' only, instead of being distributed over the whole surface of the bore and its bearing on the shaft, and consequently permitting the pins or the grooved portion of the hub or shaft to be sufficiently distorted by the pressure to take up any lost motion that might be developed by service; and in order to thus secure the perfect fit of the pins g' it is evidently essential that the hub-bore should be slightly larger than the shaft, as otherwise it would be impossible to close the bore and press the pins into the grooves, as required.

Another feature of our invention relates to the construction of the handles. The rapid vibration or quivering caused by the movement of the machine even on smooth roads is generally recognized as most annoying and objectionable, owing to the numbness produced in the hands of the operator by the constant and firm grip required. Even when the spring-fork is used it does not overcome this, and attempts have been made to provide a satisfactory elastic handle. For this purpose they have been formed of elastic rubber, either solid or with an air-chamber, but the use of such has been practically abandoned as unsatisfactory. We have found that the trouble with these elastic handles has been not that their elasticity does not materially reduce the jar and consequent numbing tendency, but that the hand fits too closely to the rubber surface, thus excluding all air and causing it to become clammy and unpleasant in feeling and in odor. We have endeavored to overcome these objections and still secure the desired elasticity, and to accomplish this have merely provided a core r of elastic rubber or equivalent material and have covered the surface with a fibrous fabric r', such as felt or linen, either woven in tubular braid and drawn over the core, or thread wound separately around it with which the hand comes in contact, and which, without interfering with the elasticity of the handle, prevents the conduction of heat to the rubber, and thus avoids the disagreeable odor produced if the hand is directly in contact with it, absorbs the perspiration which causes the clammy and unpleasant sensation referred to, and provides a more agreeable and firmer hold than can be secured with any other than a porous absorbent non-conducting material, such as described.

We do not broadly claim the spring-fork arrangement shown nor the special chain-adjusting arm described, except when used in duplicate, so as to produce a positively parallel movement of the axle to which they are secured. We are aware, also, that it is not broadly new to adjustably secure a saddle having a curved base to a suitable supporting-stand; but what we do wish to claim as our invention, including such modifications of construction as may be readily devised by an expert, is specifically set forth in the following claims.

What we claim is—

1. In a cycle, the combination, with a saddle-supporting stand, of a saddle having an elastic base forming normally a tangent with the supporting-surface of the stand, and adjustable clamping mechanism adapted to distort the normal shape of said elastic base in clamping the same to the stand, substantially as set forth.

2. In a cycle, the combination, with a saddle-supporting stand, of a saddle having an elastic base forming a tangent with the supporting-surface of the stand, a seat connected to the upwardly-extended ends of the elastic base, and adjustable clamping mechanism whereby the tension upon said seat is regulated, substantially as set forth.

3. In a bicycle, a saddle-supporting stand having a curved supporting-surface for the saddle and a T-slot therein for the clamping-bolts, substantially as set forth.

4. In a cycle, the combination, with a saddle-stand having an upwardly-curved supporting-surface, of a saddle having an elastic base curved upward to a larger radius than the supporting-surface of the stand, and means for clamping said base to the stand, substantially as set forth.

5. A cycle-handle consisting of an elastic core, as of rubber, and a fibrous absorbent covering of linen or other suitable non-conducting material, substantially as and for the purpose set forth.

6. In a velocipede, the combination, with the pedal-shaft having three or more longitudinal grooves, of the crank having a correspondingly-grooved hub-bore loosely inclosing the shaft and a slot in the crank extending from said bore, pins entered in the grooves, and a clamping-bolt, all substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

GEO. W. MEIGS.
JOHN GEORGE ZIEGLER.

Witnesses:
H. P. KEISER,
J. H. JACOBS.