Aug. 8, 1939. A. J. LINDER ET AL 2,169,105

BICYCLE SADDLE

Filed April 22, 1938 2 Sheets-Sheet 1

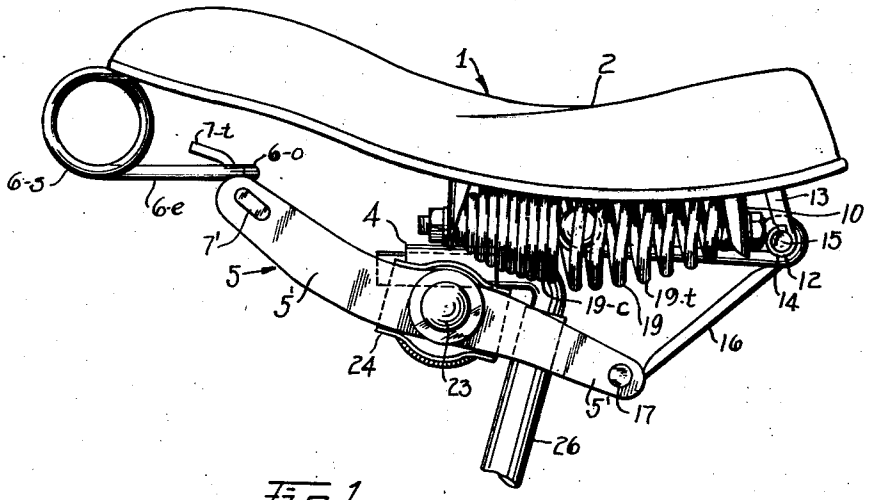

Fig-1

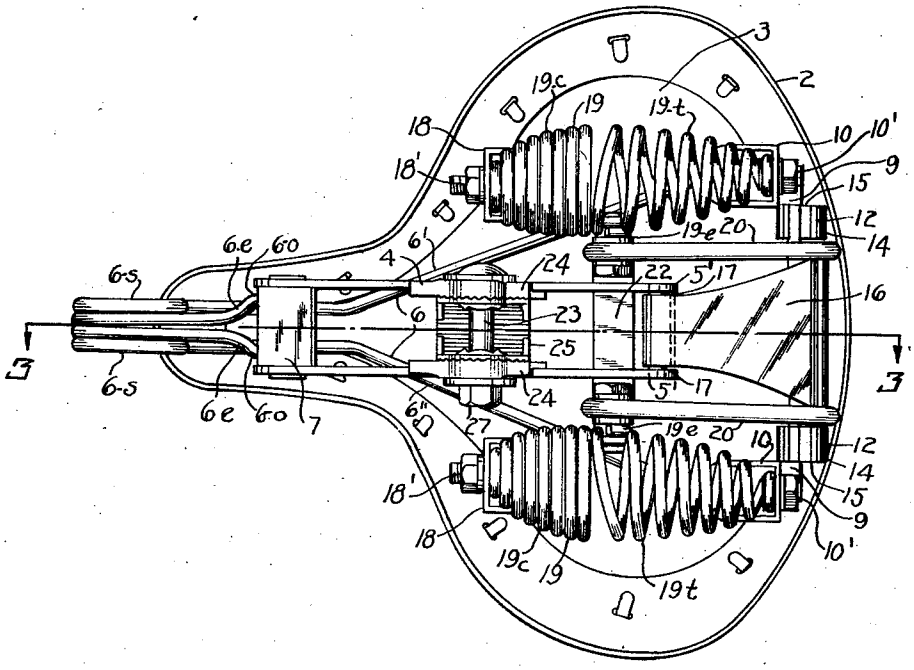

Fig-2

INVENTORS
ANDREW J. LINDER
HAROLD E. KALTER

BY Frank M. Stough

ATTORNEY.

Aug. 8, 1939. A. J. LINDER ET AL 2,169,105

BICYCLE SADDLE

Filed April 22, 1938 2 Sheets-Sheet 2

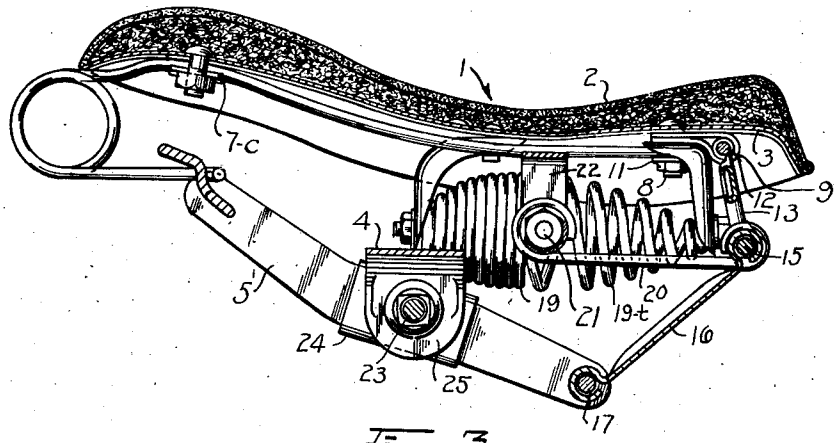

Fig. 3

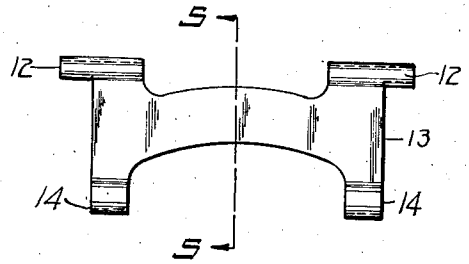

Fig. 4

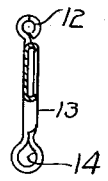

Fig. 5

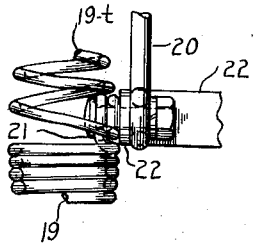

Fig. 7

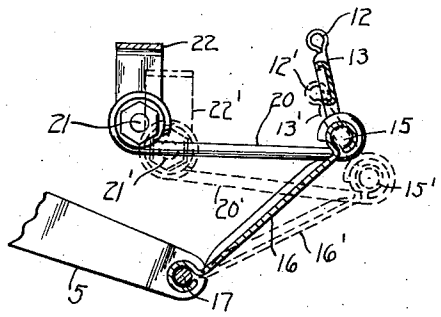

Fig. 8

INVENTORS.
ANDREW J. LINDER
HAROLD E. KALTER

BY

ATTORNEY.

Patented Aug. 8, 1939 2,169,105

UNITED STATES PATENT OFFICE

2,169,105

BICYCLE SADDLE

Andrew J. Linder and Harold E. Kalter, Elyria, Ohio, assignors to The Troxel Manufacturing Company, Elyria, Ohio, a corporation of Ohio

Application April 22, 1938, Serial No. 203,562

7 Claims. (Cl. 155—5.20)

This invention relates to saddles of the type adapted to be used for bicycles, motorcycles, velocipedes and the like and more particularly to a saddle of the spring supported type.

Our invention relates to improvements in saddles of the type of that disclosed in United States Letters Patent to David S. Troxel, No. 1,022,447, patented April 9, 1912, wherein movements of the saddle, in use, in both upward and downward directions, are cooperatively resiliently resisted by spring sections alternatively acting as compression and tension springs.

While the saddle of the above type is still in popular wide-spread use, in the interests of compactness of construction, better appearance, and the elimination of the downwardly projecting clothing-catching spring and spring securing ends, other saddles having but a single spring action, have also been more recently in demand even though the same riding comfort is not achieved.

An object of the present invention, therefore, is to provide an improved cycle saddle of the double-action tension-compression spring type, wherein the present day aesthetic objections to saddles of the type disclosed in the said Troxel patent, are absent.

Another object of our invention is to provide a double-action spring supporting structure for a cycle saddle which will be more presentable in appearance than those previously proposed.

Another object of our invention is to provide an improved saddle of the double-action supporting spring type which will be more efficient in operation than prior saddles with which we are at present familiar.

Other objects of our invention and the invention itself will become more apparent by reference to the accompanying drawings of an embodiment of our invention, and from reference to the following description of the said embodiment, wherein reference is made to the said drawings, and in which drawings:

Fig. 1 is a side elevational view of a cycle saddle embodying our improved construction;

Fig. 2 is a bottom plan view of the saddle of Fig. 1;

Fig. 3 is a medial sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a rear elevational view of a link member which may be employed;

Fig. 5 is a section taken along line 5—5 of Fig. 4;

Fig. 6 is a fragmentary view, largely diagrammatic, showing the relative position of parts of the saddle under loaded and unloaded conditions; and

Fig. 7 is a fragmentary detail view, showing the connection between the link means and the springs.

Referring now to the drawings, the saddle seat is illustrated generally at 1 and comprises a padded saddle covering 2 of any desired construction, and a metallic seat frame, suitably formed to constitute the lower surface of the seat and to which the padded covering 2 is suitably affixed, in any desired manner.

At 4 there is shown a saddle clamp of any well known type for securely clamping the cycle saddle onto the top of a saddle post, and in the type shown, the clamp 4 is adapted to clamp the saddle onto the horizontal forwardly directed arm of an inverted substantially L-shaped saddle post, the lower depending arm of which is preferably rigidly secured to the frame of the cycle.

The clamp 4 is secured to a pair of parallel members 5' of a preferably sheet metal reach member 5. Secured to the underside of the seat frame 3 is a spring wire 6 bent substantially to V-form and extended adjacent the confluence of the converging lateral arms 6' and 6'' to form spring coils 6—*s*, adjacent the pommel portion of the saddle. The spring rails are axially aligned to define a two-section spiral spring, the inner adjacent ends 6—*e* being given the form of a loop 6—*o* which is interlocked with a tongue 7—*t* of a sheet metal element 7 bridging the forward ends of the reach element members 5' and secured thereto in any suitable manner, such as by the riveting or heading-over of the portions 7' projected through openings extending laterally through the forward ends of the said members 5'. It is to be understood that other suitable means may be employed for hingingly connecting the forward end of the reach member 5 to the saddle.

The spring wire arms 6' and 6'' are fastened to frame 3 in any suitable manner as by projecting the arms through a clip 7—C secured to the under side of the frame adjacent the spring coil 6—*s* and providing eyes on the ends of the arms 6' and 6'' which may be telescoped over laterally spaced bolts 8 secured at the rear of the saddle to frame 3. Bolts 8 also project through the perforated arms of a pair of loop elements 9 and through a perforation provided in a leg of a pair of generally inverted L-shaped brackets 10, the loop element, spring arm end, and bracket 10 being secured on bolt 8 by a nut 11.

Each loop element 9 pivotally receives one of

a pair of laterally extending arms 12 of a link element or hinge member 13 which is provided in its lower portion with spaced bearings 14—14 for receiving a pin 15. Encircling pin 15 is one end of a second link or hinge member 16 having the opposite end encircling a pin 17 extending between the parallel members 5 of the reach member.

A second pair of brackets 18, generally of inverted L-shape are bolted to the frame 3 and a pair of springs 19—19 are supported between the brackets 10 and 18 preferably so that they are suspended below the seat portion. Springs 19 are of helical type and of generally conical form having their extremities anchored to brackets 10 and 18 by bolts 10′ and 18′ respectively in a generally horizontal position. A pair of link elements 20 are each hooked around pin 15 at one end and at their opposite ends are secured to springs 19 by engaging bolts 21 projecting laterally through eyes 19*e* formed at the junction of portions 19*c* and 19*t* of the springs and clamped thereto. It will be noted that the portion 19*a* of each spring is normally under tension or compressed and the portion 19*t* is normally under compression or expended. Thus, the links 20 are connected between these two forces of the spring sections which provide a double action compression-tension type of movement. Both springs 19 are connected to a generally U-shaped strap 22 engaging bolts 21 to insure that both springs will be equally subjected to tension and compression.

The means for clamping the saddle to the saddle post constitutes no essential part of the present invention and any suitable clamping means may be employed although we preferably employ the clamp means illustrated herein and more fully described in a co-pending application entitled "Cycle saddle clamp" Serial No. 64,906 filed February 20, 1936.

The parallel members 5′ of the reach member are perforated intermediate their ends to receive a headed bolt 23 also projected through a pair of clamp members 24—24 and a generally U-shaped intermediate clamp member 25 whereby the saddle post 26 will be tightly gripped by jaws of member 25 upon tightening of a nut 27 engaging bolt 23 to draw the arms of the member 25 together.

The operation of the saddle will now be described and is best illustrated in Figs. 3 and 6, Fig. 6 being mainly diagrammatic. When the saddle is not under load it will assume the position illustrated in Fig. 3 and in full lines in Fig. 6, it being understood that the parallel reach members 5′ are securely clamped to the saddle post and are substantially immovable with respect thereto. Upon the weight of the rider being applied to the saddle and mainly at the rear portion of the saddle the rear portion of the saddle will be forced downwardly whereby link element 13 will assume the position 13′ causing pin 15 to move rearwardly substantially horizontally and assume the position 15′ and resultantly member 16 will assume the position 16′ pivoting around pin 17 since the reach member 5 is fixed with respect to the cycle frame and saddle post. Pin 15 will carry link elements 20 rearwardly to the position 20′ and also strap 22 to the position 22′ thereby compressing spring portion 19—*t* and placing spring portion 19—*c* under tension.

It will be noted that the aforementioned movement of the saddle and supporting structure is a combined rearward movement and downward movement or that one pair of springs absorbs both vertical and longitudinal movement. The inter-locking of tongue 7—*c* at the forward portion of the supporting structure with loop 6—*o* permits both a pivotal movement and a limited longitudinal movement of the spring coil 6—*s* relative to the reach member. Upon continued application of load to the saddle due to road impact and the like transmitted to the cycle frame and saddle post, primarily through the rear wheel of the cycle, the angle between link member 13 and member 16 will tend to decrease and increased compression will be exerted on portion 19—*t* of the spring and increased tension on portion 19—*c* of the spring. The reverse will be true if the major portion of the load were concentrated at the pommel portion of the saddle and in this case the portion 19—*c* will be placed under compression and the portion 19—*t* under tension so that in either event a double action of compression and tension cushioning shock is provided by the springs 19. Also, each of the spring portions 19—*c* and 19—*t* exert a snubbing action tending to dampen continued movement of the saddle or to quickly bring the saddle to a stable position where the spring pressure is equalized in correspondence with the load.

Thus, we have provided a relatively simple support for cycle saddles wherein a pair of horizontally disposed springs and associated linkage not only provide a saddle of pleasing appearance but are adapted to resiliently absorb both longitudinally and vertically directed movements of the saddle relative to the saddle post.

Although we have shown and described a preferred form of our invention, we contemplate that numerous and extensive departures may be made therefrom without departing from the spirit of our invention or the scope of the appended claims.

We claim:

1. A cycle saddle comprising a reach member adapted to be clamped to a saddle post, a hinge connecting the rear portion of the saddle and the rear portion of the reach member, the hinge comprising a part pivotally connected to the saddle and a part pivotally connected to the reach member and a hinge pin connecting both parts, the hinge parts being angularly disposed whereby movement of the saddle towards the reach member will cause the angle between such parts to be decreased and effect movement of the hinge pin generally horizontally, a pair of helical type compression and tension springs each rigidly secured at either end thereof to the saddle, rigid link means connecting the hinge pin and each of the springs, the link means being connected to each of the springs at an intermediate portion thereof to place a part of each spring under compression and the other part under tension whereby movement of the hinge pin will be resiliently resisted by a combined tension and compressive force.

2. A cycle saddle comprising a rigid reach member adapted to be clamped to a saddle post, a two-part hinge having one part connected to the saddle and the other to the reach member, generally horizontally disposed compression and tension spring means, each rigidly secured at either end thereof to the saddle, and rigid link means connecting the hinge at the hinging zone with the spring means whereby hinging movement caused by relative movement between the saddle and the reach member will be yieldingly resisted by a combined compressive and tensioning spring action.

3. A cycle saddle comprising a reach member adapted to be clamped to a saddle post, a hinge member connected between said reach member and the saddle, generally horizontally disposed longitudinally extending compression and tension spring means each rigidly secured at either end thereof to the saddle, and means connecting said hinge member to an intermediate portion of said spring means for yieldingly resisting relative movement between the saddle and said reach member.

4. A cycle saddle comprising a reach member adapted to be clamped to a saddle post, a pair of spaced generally horizontally disposed compression and tension springs rigidly secured to said saddle at either end of said springs and thereby suspended by their extremities from said saddle, means for connecting intermediate portions of said springs together, a two part hinge member pivotally connected between the saddle and said reach member, means hingingly interconnecting said hinge parts, and means connecting the hinge at the hinging zone with the springs whereby hinging movement caused by relative movement between the saddle and the reach member will be yieldingly resisted by a combined compressive and tensioning spring action.

5. A cycle saddle comprising a substantially vertically movable cycle seat element, a seat supporting member adapted to be secured to the cycle, and means yieldably interconnecting said seat and member, said interconnecting means comprising an elongated spring coil underlying said seat with its axis extending longitudinally thereof, and motion communicating link means for translating substantially vertical approaching and receding movements of said seat relative to said support into substantially more nearly horizontal movements of an element of said link means, said spring coil resiliently interconnecting said seat element and said supporting member through said link means element, one of said elements connected to an intermediate portion of said coil and the other said element connected to both of a pair of coil portions disposed relatively nearer the ends thereof.

6. A cycle saddle comprising a substantially vertically movable cycle seat element, a seat support member adapted to be secured to the cycle, and means yieldably interconnecting said seat and member, said interconnecting means comprising a pair of elongated coil sections both underlying said seat with their axes extending longitudinally thereof, and motion communicating link means for translating substantially vertical approaching and receding movements of said seat relative to said support into substantially more nearly horizontal movements of an element of said link means, said spring coil sections resiliently interconnecting said seat element and support member through said link means element, one of said elements connected to a forward end of one of said coil sections and a rear end of the other coil section, and the other said element connected to the other ends of said coil sections whereby alternate approaching and receding movement of said seat relative to said support will alternately and differentially apply compressive and tensional stress to said coil sections.

7. A cycle saddle comprising a substantially vertically movable cycle seat element, a seat supporting member adapted to be secured to the cycle, and means yieldably interconnecting said seat and member, said interconnecting means comprising a pair of relatively parallel elongated spring coils underlying said seat with their axes extending longitudinally thereof, and motion communicating link means for translating substantially vertical approaching and receding movements of said seat relative to said support into substantially more nearly horizontal movements of an element of said link means, said spring coils resiliently interconnecting said seat element and said supporting member through said link means element, one of said elements connected to intermediate portions of each of said coils and the other said element connected to both ends of each of said coils.

ANDREW J. LINDER.
HAROLD E. KALTER.