Aug. 7, 1945. J. E. LASKIN 2,381,128

ORTHODONTIC BRACKET SPRING

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Fig. 1

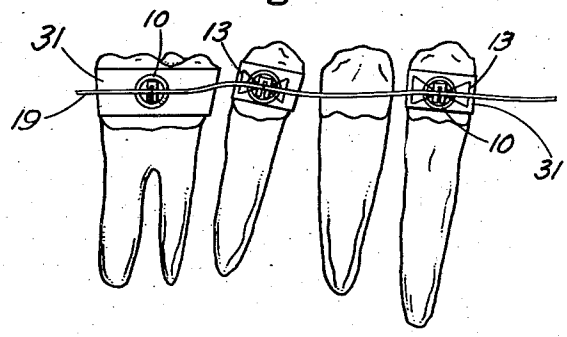


Fig. 2

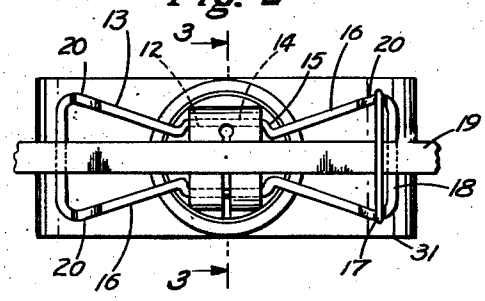
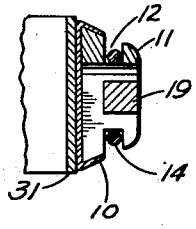


Fig. 3



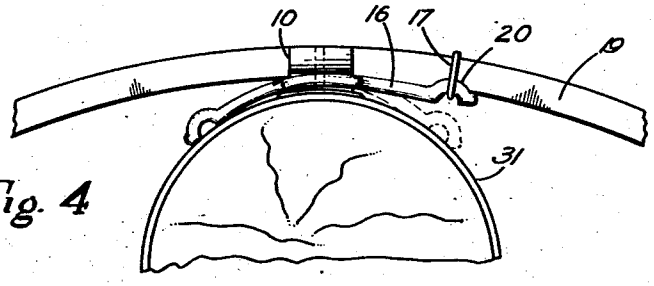


Fig. 4

Fig. 5

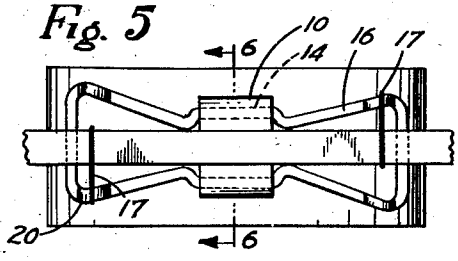
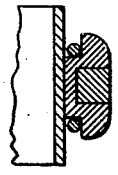


Fig. 6



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Fig. 7

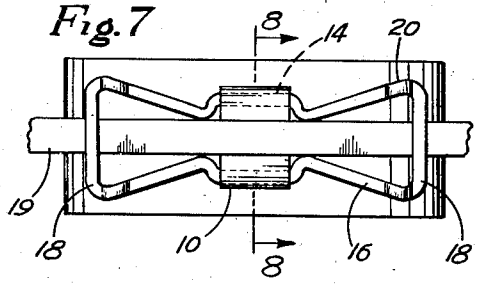
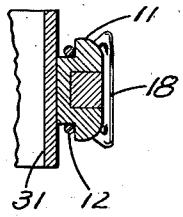


Fig. 8



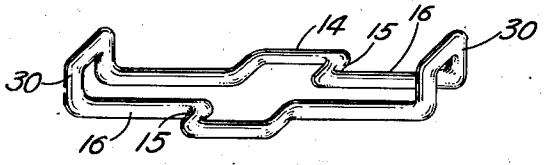


Fig. 9

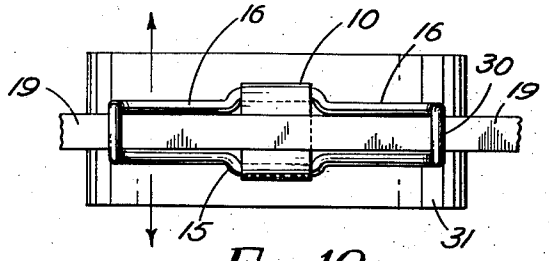


Fig. 10

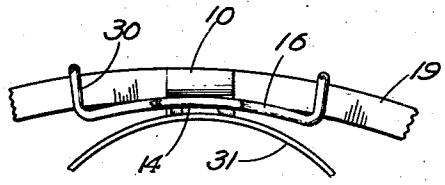


Fig. 11

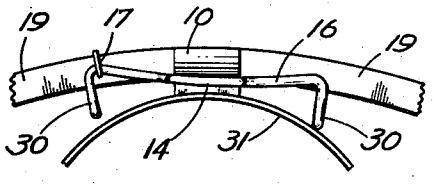


Fig. 12

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UNITED STATES PATENT OFFICE

2,381,128

ORTHODONTIC BRACKET SPRING

Jacob E. Laskin, Shaker Heights, Ohio

Application October 18, 1944, Serial No. 559,142

10 Claims. (Cl. 32—14)

This invention relates broadly to orthodontic appliances and more specifically to improvements in traction springs for the corrective treatment of malposed teeth.

One of the objects of the invention is to provide a spring which is designed to facilitate torsional strains to effect a rotative movement of a tooth, tensive strains to effect axial movements thereof or compressive strains to effect the anchorage of the arch bar within the bracket.

Another object of the invention is to provide a looped spring which is constructed for snap-on engagement upon an arch bar bracket.

Another object of the invention is to provide an orthodontic appliance which will eliminate the use of tooth band staples, and minimize the use of the ligatures employed therewith.

Further objects of the invention reside in the provision of a traction wire which is economic of manufacture, efficient of operation, and susceptible of interchangeable assembly with dentures of variable form.

Other objects and advantages more or less ancillary to the foregoing and the manner in which all the various objects are realized will appear in the following description, which considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

Referring to the drawings:

Fig. 1 is an elevational view of a plurality of banded teeth illustrating the arrangement of the improved traction spring in relation to the arch bar and supporting bracket therefor;

Fig. 2 is an enlarged view of the traction spring shown in its assembled position upon an arch bar bracket;

Fig. 3 is a transverse section through the bracket shown in Fig. 2, the section being taken on the line 3—3 of Fig. 2 and illustrating the use of ears or end wall flanges for the retention of the traction spring;

Fig. 4 is a plan view of the assembly shown in Fig. 3 including a transverse sectional portion of a tooth, the traction spring as mounted herein illustrating the form of connection employed to effect rotative movement of the tooth;

Fig. 5 is an elevational view similar to Fig. 2 illustrating the form of connection employed to effect axial correction of the tooth;

Fig. 6 is a transverse section on line 6—6 in Fig. 5;

Fig. 7 is an elevational view of the assembly shown in Fig. 2 showing the improved spring mounted to effect the support of the arch bar within the bracket;

Fig. 8 is a transverse section on line 8—8 in Fig. 7 illustrating the use of the spring for retention of the arch bar within the bracket;

Fig. 9 is a view in perspective of a modified form of the traction spring illustrated in the foregoing figures;

Fig. 10 is an elevational view of the traction spring shown in Fig. 9 showing the arrangement thereof in relation to the arch bar;

Fig. 11 is a plan view of the assembly shown in Fig. 10; and

Fig. 12 is a similar plan view of the traction spring and bracket shown in Fig. 11 illustrating the form of the spring when used to effect rotative movements of the tooth.

Referring first to Fig. 3, the bracket 10 may be of any conventional form such as the rotatively adjustable construction illustrated or a fixed bracket of the type which embodies laterally disposed ears or flanges 11 defining grooves 12 in the opposed side walls adjacent the top face thereof. As will be seen in Fig. 2 the tension spring 13 comprises a continuous loop of spring wire having a pair of spaced parallel central sections 14 formed for spring pressed engagement within the grooves 12 and further configured with offset shoulders 15 adjacent the ends of the lineal bearing seats or grooves 12 to prevent lateral movement of the spring relative to the bracket. The arms or straight sections 16 of the loops are formed with crescent bends 20 therein to provide bearing seats for ligatures or tie wires 17 which may be employed to stress the spring arms 16 relative to the arch bar to effect the desired corrective movement of the tooth under treatment. To effect rotative movement of a tooth one end of the loop is drawn into intimate engagement with the arch bar by the ligature 17, the opposed loop being disposed in abutting engagement with the tooth band as shown in Fig. 4. In such treatment the arms 16 of the traction spring are bent to initiate a tensive effort between the arch bar and bracket requisite with the pressure required to effect the desired degree of rotation of the tooth. In axial corrections of a tooth one of the arms 16 in each of the diagonal loops is connected to the arch bar by the ligature 17, as shown in Fig. 5, the tractive effort thereon being regulated progressively during the treatment to effect the desired movement of the tooth. When desired the end portions of the loops 18 may be assembled to overlie the outer face of the arch

bar as shown in Fig. 7 to assure the seated engagement of the bar 19 within the bracket 10.

In applications where it is desired to close the opening between adjacent teeth a traction spring of greater length than the width of one of the teeth may be employed, the end of one of the loops in such case being arranged to bear upon the leading edge of the malposed tooth or if required the end portion of the loop may be used in substitution of the band staple formerly used for anchorage of a ligature.

As illustrated in Fig. 9 the alternate spring construction comprises a central body portion similar to that shown in Fig. 2 but formed with parallel arms 16 terminating in upturned loops 30 designed for assembly over the face of the arch bar 19 and adapted for snug engagement therewith. When this tension spring is employed to secure the arch bar within the bracket the arms 16 of the spring arms are sprung apart and the central lineal portion of the loop is snapped over the ears 11 of the bracket, the loops 30 at such time being telescopically engaged with the arch bar 19. When it is desired to effect the buccal movement of the tooth the arms 13 are bent upwardly or downwardly in the directions indicated by the arrows in Fig. 10 to initiate the tension required to effect the axial correction of the malposed tooth. When rotative movement of the tooth is desired the spring is snapped over the bracket with the loops 30 disposed toward and in abutting relation with the tooth band 31. A ligature 17 is used to exert a tensive force between the arch bar and one end of the spring, the ligature, in coaction with the abutment of the opposed end, effecting a rotational movement of the tooth.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, and means for supporting an end portion of said loop in intimate engagement with the arch bar.

2. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, and means for connecting an end of said loop with said arch bar with the intermediate portions of the loop under tensive strain.

3. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, and means for the retention of the arch bar in stressed relation with the bracket.

4. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, and secondary loops in the ends of the loop for attachment thereof to the arch bar.

5. In combination with an orthondontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, the transverse end of one side of the loop being engaged with the arch bar to resist tensive strains imposed upon the bracket through the arms of the loop.

6. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, and means for holding an end of said loop against vertical movement relative said arch bar.

7. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, and kinked portions in said loops for the securement thereof to the arch bar.

8. In combination with an orthodontic arch bar and arch bar bracket having lateral ears thereon, a traction spring comprising a wire loop, spaced strands in the central portion thereof for seated engagement about the bracket beneath the ears therein, shoulders in said loop intimately engaged with portions of the end walls of the bracket, means for locking one end of the loop beneath the arch bar and means in the opposed end of the loop to facilitate the connection thereof with the next adjacent tooth.

9. An orthodontic traction spring for use with an arch bar bracket having grooves in opposed walls thereof, comprising a continuous spring wire loop, a rectangular central portion therein adapted for spring pressed engagement with the grooves in the bracket and end walls thereof, and secondary bends in the ends of said loop formed to overlie the outer face of an arch bar.

10. An orthodontic traction spring for use with an arch bar bracket having grooves in opposed walls thereof, comprising a continuous spring wire loop, a rectangular central portion therein adapted for spring pressed engagement with the grooves in the bracket and end walls thereof and secondary bends in the end portions of said loop to facilitate the anchorage of the traction spring to an arch bar.

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