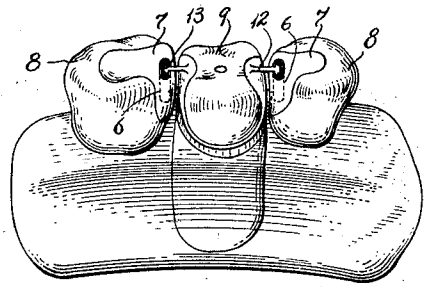
Apr. 17, 1923. 1,451,718

I. STERN

ADJUSTABLE ATTACHMENT FOR REMOVABLE BRIDGE WORK

Filed Sept. 15, 1921

Fig. 1.



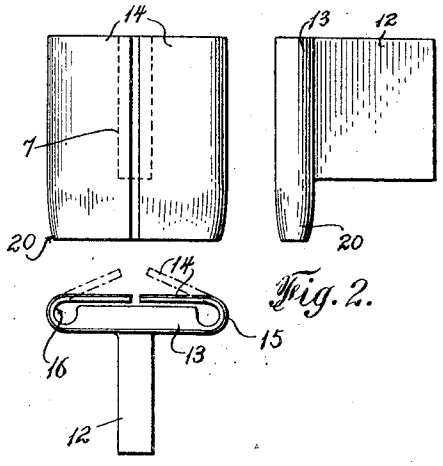
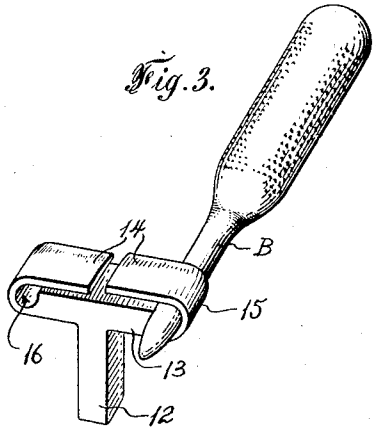


Fig. 2.

Fig. 3.



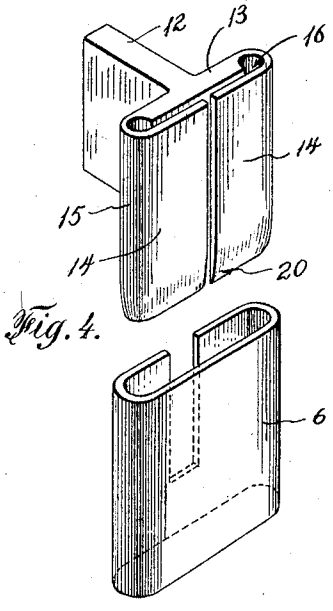


Fig. 4.

Inventor

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By James C. Ledbetter Attorney

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UNITED STATES PATENT OFFICE.

ISIDORE STERN, OF NEW YORK, N. Y.

ADJUSTABLE ATTACHMENT FOR REMOVABLE BRIDGEWORK.

Application filed September 15, 1921. Serial No. 500,766.

To all whom it may concern:

Be it known that I, ISIDORE STERN, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Adjustable Attachments for Removable Bridgework, of which the following is a specification.

This invention relates to dentistry and especially to removable bridge work. More particularly the invention relates to adjustable attachments for use in connection with dental bridges.

Primarily, it is an object of this invention to improve over the construction, the design, and the adjustable attachment for removable dental bridge work as disclosed in my co-pending application for Patent Serial No. 422653, filed November 8th, 1920.

The important object of my invention is to produce an adjustable anchor piece or attachment for use in connection with all types of bridge work of the character employing a socket made on or in a pier tooth to receive and hold the dental bridge in position; and it being a further object to make this adjustable attachment adaptable for use either in connection with sockets made in tooth inlays, or for use in connection with a socket anchored to a tooth crown, as will be understood by those conversant with the art.

An additional object of this invention is to produce a novel and improved removable bridge work attachment which is adjustable to remove looseness existing between the anchor part and socket, which looseness is caused by wear occasioned through removal and replacement of the bridge in the mouth, to the end that the bridge, though used for a great length of time, may be kept tight and caused to remain firmly in position.

It is likewise an object to produce an attachment for removable bridge work which has an improved construction to admit of adjustment by using a suitable spreading tool, such as a thin bladed instrument, and a distorting tool, so that the attachment may be adjusted by the wearer to slightly increase its general over-all size or thickness to eliminate looseness and play, in order that the bridge may be worn with comfort and usefulness.

My bridge work attachment is an improvement over the art in respect to its adjustability, because the head may be expanded, thickened, or made larger without losing the parallelism of the head surfaces. This feature is a distinct advantage because the head fits back into the socket with surface contact as opposed to point or line contact. There are numerous adjustable dental attachments in the art, but their engaging surfaces, when bent or expanded to a new position, lose their parallelism and become tapered or thinner at one end which produces looseness when the attachment is inserted in the socket. My improved denture overcomes such disadvantage, and when its head is expanded its walls remain parallel and it fits into the socket with all the surface area thereof actually in contact with the socket surface area, thus producing a close fitting dental attachment.

It is known that the advantages of removable bridge work lie in the fact that the bridge may be so constructed and placed in the mouth that a slight degree of relative movement may exist between the bridge itself and the sound teeth acting as piers or points of support, and this permits slight relative motion to exist between the two pier teeth themselves in order that the sound teeth may move in function, which is to say the two pier teeth are not rigidly anchored one to the other by the bridge structure therebetween but are capable of natural movement and function in the gum and root in the same manner as if no bridge was supported thereon. Thus the disadvantages of immovable and fixed type of bridge work is overcome, because the two pier teeth supporting the bridge are not impaired in their *individual functions*, and therefore removable bridge work is desirable not only from this point of view but is preferred because *it may be removed to be* cleaned.

But, however, the dental bridges of present day use *become loose and either fall out* of the wearer's mouth or function improperly due to too much lost motion. This disadvantage of *removable bridge* work is occasioned by the fact that the denture parts, consisting of the tubular socket and anchor piece or attachment, become worn and loose *one relatively to the other.* It is fitting,

therefore, that the object of my invention is to produce a simple anchor part, or bridge work attachment, which may be adjusted by the wearer to hold the dental bridge in place so that it does not cause the wearer annoyance and inconvenience.

To this end I will now describe an embodiment of my invention, and though I describe a preferred form of construction and function, I claim a right of protection as to such changes as may obviously come within the scope of my invention. The several figures in the drawings as hereinafter described, represent a dental bridge and attachments therefor, in views greatly enlarged over the actual size of the attachments as manufactured for the trade; and the enlargement is necessary for a more perfect understanding of the design and construction thereof.

Figure 1 illustrates a general perspective view of any practical form of bridge, to which my improved attachments are joined; and the bridge is shown supported in position between the two pier teeth having inlay sockets for the reception of my improved denture parts.

Figure 2 shows a cluster view of the attachment only, said attachment being shown in front, side and plan views.

Figure 3 shows a perspective view of the attachment with a distorting tool thrust into an opening formed in the head or web for the purpose of displacing the attachment wings to a new position to enlarge and thicken the head part so that looseness of the bridge will be eliminated.

Figure 4 illustrates a perspective view of the tubular receptacle, or socket part, and the attachment, both parts being shown in alignment ready to be fitted together.

A dental bridge attachment constructed in accordance with the plans of my invention embodies a T-shaped denture having improved adjustable characteristics. The attachment embodies a head which preferably has a shank by which the head is anchored to the bridge; and the head part consists of a web and laminæ or wings having a certain facility for adjustment as hereinafter explained in detail.

Referring now more in particular to the drawings for a more precise explanation of the principles and construction of my invention, there is shown a socket 6 which is either anchored on the side of a tooth crown, or installed in a tooth inlay, dependent upon the particular dental problem and installation work to be performed. In the drawings, the socket 6 is shown made a part of the inlay 7 carried by the pier tooth 8; and the bridge 9 consists of porcelain or metal structure, to which is anchored my improved attachment, which attachment fits into the socket to hold the bridge in position as illustrated.

The anchor part or attachment itself, comprises a shank 12 integrally made with a web 13. Wings 14 are integrally formed on opposed edges of the web 13. The web and the wings comprise the attachment head 13—14 which fits into the socket 6. The specific construction of the head 13—14 makes for the success of this adjustable dental attachment which functions in a manner as later described. The web 13 is made in the form of a substantially rectangular plate which is an integral part with the shank 12, and which is formed right angular to the shank.

The attachment or anchor, together with the socket 6, is usually manufactured by skilled artisans for the dental trade; and these parts are purchased by the professional trade or dentists and made up into bridges by soldering or otherwise anchoring the shank 12 onto a porcelain or gold bridge as desired, and by utilizing the socket 6 either in the tooth inlay or on a tooth crown, dependent upon the exigencies of the particular re-construction work at hand.

With particular reference to the important design and construction of this attachment, it is pointed out that the web 13 and the shank 12 are constructed of material somewhat heavy and thick as compared to the thin wing structure 14. Each wing in fact comprises a flat plate-like section 14 having a curved wall 15, which wall joins to and forms an integral part with the web 13. At the point of juncture between the curved wall 15 and the web 13, the said web increases in thickness, and this particular construction forms a hole or opening 16, which is more practically a cylindrical opening, as shown in the drawings; and this opening passes longitudinally through the web from end to end thereof.

The head is so designed and constructed as to leave a slight clearance space between the wing sections 14 and the web 13. This clearance is minute in small dental attachments, but is perceptible to the extent of a few thousandths of an inch in order that the wings may be compressed or contracted slightly, or in fact yield under pressure towards the web 13. Likewise, the wings have their adjacent edges terminating approximately along the center line of the shank 12 in order that the wings be symmetrical and function similarly one to the other.

The purpose of the clearance space between the web and wings, as hereinbefore mentioned, is to permit the said wings to contract or bend inwardly against the web 13; and in addition to this, it is also contemplated that a small prizing or adjusting tool, not shown in the drawings, may be inserted into the space between the wings and the web to expand and bend the said wings out-

wardly whereby the general over-all thickness of the head 13—14 is somewhat increased. When a prizing tool is inserted between a wing and the web, the heavy and unyielding web 13 resists the combined force of the prizing tool and the distorting tool (shown in the drawings at B) which causes the said tools, in case both are used, to impose the combined effort of both tools upon the wing whereby the wing is bent outwardly away from the web 13, such for example as shown in dotted lines in the top plan of the cluster view. It is, therefore, an advantage to make the web substantially heavy and the wing 14 comparatively light so that the wing only is subjected to the adjustment and displacement produced by the prizing tool and distorting tool. It is to be noted that, when the wing is bent outwardly, the arcuate wall portion 15 will be caused to undergo slightly permanent enlargement or increased diameter because when the prizing tool is inserted between the wing and web adjacent the opening 16, the prizing force is applied to the wing at the curved wall 15 which causes the said curved wall to receive the bending strain. In this manner the diameter of the curved wall 15 and the diameter of the opening 16 defined by the said curved wall, is somewhat increased, and the curved wall is caused to permanently assume a slightly increased diameter which causes the wing to stand out at a slight angle to the web 13. At this stage of the operation, a distorting tool B is thrust into the enlarged cylindrical hole 16, and acts somewhat as a reforming tool to maintain the permanency of the increased diametrical size of the wall 15. With the distorting tool B in position, a slight pressure is imposed on the free outer end of the wing to bend it back into parallel position with the web 13. In this manner, the wing section 14 is caused to assume a slightly displaced position, and thereby acquires a new position parallel to the web 13 which it theretofore did not occupy.

It is, therefore, seen how a flat prizing tool, such as a pen knife blade, not shown in the drawings, may be inserted between the wing and web to bend the wing outwardly, followed by inserting the round distorting tool B in the hole 16, and then followed by bending the wing 14 back into parallel position with the web 13; and after this adjustment is made on both wings 14 to reform each the same with the other, the said head 13—14 has become somewhat increased in thickness. With the increased size and thickness now possessed by the head it will more firmly and tightly engage the socket when the bridge 9 is again placed in position.

Figure 3 shows one stage of the above described operation in carrying out the readjustment and refitting of the bridge. This view clearly shows one wing as lying closely adjacent to the web 13, which indicates that this particular wing has not been adjusted. The other wing, is shown just after having been adjusted and prior to the removal of the distorting tool. In this illustration, the distorting tool B functioned to maintain permanently the enlargement of the wall 15 and the hole defined thereby, so that when you pressed the wing 14 back into position, the said wing surface assumed a new position parallel with the web 13, which position leaves slightly more space between the web and wing to thicken and enlarge the head.

It is to be noted that the above adjustment may be effected by dentists, or indeed, the wearer himself may be instructed in the adjustment of his bridge. Two tools may be used for this operation, namely, any form of flat bladed instrument such as a pen knife, and a round instrument such as a needle may be used to good advantage for effecting the adjustment. Only the distorting tool B, which may be a needle or pin-like rod as mentioned, is shown in the drawings, for it is readily understood by those conversant with the art how any other thin bladed tool may be practically used in connection with the distorting tool B in effecting the refitted adjustment of this attachment.

It is not essential that the distorting tool be used in effecting the adjustment of the wings, for indeed the wings may very readily be displaced outwardly by using a prizing tool only to very slightly bend the wings outwardly. The wearer of the bridge may not find it necessary to do more than delicately bend the wings outwardly, but a skilled dental mechanic may desire to use the two tools, one to supplement the other, in securing a technically accurate reparalleling enlargement of the head. It is, therefore, an advantage, in refitting and re-aligning the bridge after long use, to go to a skilled dentist who may very readily make the above adjustment so the bridge will properly function.

Though it is necessary to have the denture attachment engage the socket with sufficient pressure and frictional engagement as to firmly hold the bridge in place, it is inadvisable to rigidly anchor the denture attachment in the socket so as to produce an immovable structure throughout the two pier teeth and bridge work. My invention, as embodied in the type of attachment herein disclosed, provides suitable means for filling this somewhat difficult requirement, because in the relatively heavy web and comparatively thin flexible wing structure, you have an attachment which firmly anchors itself within a socket, yet there exists a slight per-

missible relative motion between the attachment and the socket due to the flexibility of the wings and the clearance space between the wings and the web. The motion which this construction permits to exist between the bridge itself and the pier teeth is not perceptible, for indeed, the bridge is apparently permanently and immovably installed in position when held by my attachments. But, however, the fact remains that enough relative motion may occur by virtue of the clearance spaces and flexible wings to permit the pier teeth to move in function and not become strained in the gum structure which would occur if my bridge work attachment produced a solid immovably anchored construction.

As noted in the drawings, the lower end of the head, namely, the wings 14 and the web 13, is tapered as indicated by the numeral 20, the said tapering structure being formed on both the outer edges and the side surfaces of the head. This tapering construction, though not necessary in the actual manufacture and production of the attachment, is preferred in order that the said attachment may readily pass back into the socket 16 subsequently to being enlarged by adjustment. The tapered formation 20 prevents possible contact and interference when the web and wings slidably engage the tubular socket 6, and thereby causes the bridge to readily go into place.

By adopting my attachment and invention, it is possible to retain the proper fitted relation between the removable bridge and the pier teeth sockets in order that the said pier teeth and the removable bridge cooperate to form a continuous and uninterrupted occlusal surface. Furthermore, the bridge may be retained in comfortable working position by adjustment as above described.

One of the distinct advantages of the invention lies in the fact that the front and back surfaces of the head, namely, the outer surfaces of the wings and the web, remain in true parallelism after the part has been adjusted. It is different with adjustable bridge work attachments now on the market, for in adjustment thereof they usually fit in the socket with point or light contact, because when expanded they produce a tapered body which actually engages the socket by contact between one or more points or lines of structure; whereas, in my attachment, I provide ways and means for effecting re-adjustment and enlargement of my denture part without impairing the surface parallelism of the walls thereof.

A removable bridge attachment constructed in accordance with the plans herein disclosed, will fill a long felt want for a device of this class, and make more practical, usable and comfortable all classes of removable bridge work, and enhance and make more popular the use of removable dental bridges.

I claim:

1. A denture attachment for use in connection with removable bridge work of the type having a socket to receive the attachment and hold a bridge in position, comprising a shank by which the attachment is anchored to the bridge, a head made on the bridge and fitting into the socket, said head comprising a substantially rectangular plate, a wing integrally formed on two opposite edges of the plate to provide a pair of wings having adjacent edges approximately meeting in the center of the plate, and the aforesaid wings being constructed of metal pieces comparatively thinner than the aforesaid plate and being uniform in thickness in order that the wings may be readily bent outwardly to increase the over-all thickness of the head to effect a close fitting connection with the socket.

2. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket and hold a bridge, comprising a rectangular shaped member adapted to slide into the socket, a wing formed on opposite parallel edges of the rectangular shaped member to provide two opposed wings which have their adjacent edges closely spaced and extending parallel to the vertical axis of the socket, said wings having their meeting edges extending centrally of and parallel to the web, said wings being constructed of material of uniform thickness and comparatively lighter in weight and thinner in wall structure than the aforesaid rectangular member, said wings being capable of slight distortion to increase the over-all thickness of the attachment part which fits into the socket to effect a tight fitting relation between the bridge and the pier tooth.

3. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket and hold a bridge, comprising a shank and head piece, said head piece provided with an opening formed longitudinally therethrough, the said opening having a dividing slot made through the wall of the head, a pair of expandible wings having adjacent edges defined by the dividing slot, the said wings being constructed of material comparatively thin and uniformly thick so as to produce wings having a yieldable and spring-like characteristic so that the said wings yield under slight pressure to cause the attachment to tightly fit into the socket.

4. A denture attachment for removable bridge work comprising a head piece and shank, said head being made with an opening extending longitudinally therethrough to divide the head piece into two main wall portions, one of said wall portions having a

slot made therethrough to the aforesaid opening which divides the wall into two wing parts to produce a head having a wall and two integral wings, the said wings being expandible from the aforesaid wall to increase the over-all thickness of the head, and the said wings being constructed of material comparatively thinner than the wall and uniformly thick in order that the wings may be readily distorted to a new position parallel with the aforesaid wall.

5. A denture attachment adapted to fit into a pier tooth socket and hold a bridge, comprising a shank by which the attachment is anchored to a bridge, a head made on the shank, said head characterized in structure by having a substantially wide and thin parallel opening made therethrough to divide the head into two wall portions joined together at their edges, the inner surfaces and the outer surfaces of the said wall portions being parallel, and the wall being yieldable to admit the head into the socket under frictionally engaged contact between the socket surface and the attachment surface.

6. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket and hold a bridge, comprising a shank, a web made on the shank, wings formed on the web, the said web constructed comparatively heavy to resist the strain imposed on the attachment when adjusted and the said wings being constructed comparatively light in weight and thin in structure so as to be readily susceptible to delicate adjustment through the agency of an adjusting tool inserted between the web and wings to force the wings away from the web to increase the size of the attachment to produce a close fit in the socket, the said web and wings being constructed with a parallel clearance space existing therebetween for the purpose of allowing the wings to yield slightly under the pressure imposed by inserting the attachment into the socket.

7. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket and hold a bridge, comprising a shank, a head made on the shank, an opening made through the head to produce a head structure comprising a thick heavy wall portion and a thin flexible wall portion, the said thin wall portion having a split or opening made therethrough to divide this wall into two parts both of which are adjustable by distortion to force the two thin wall parts outwardly into a new position parallel with the heavy wall, and the aforesaid opening being parallel to produce wall portions of uniform thickness.

8. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket and hold a bridge, comprising a shank, a head made on the shank, a parallel clearance space formed through the head to produce a structure comprising a thick heavy wall portion integral with the shank and a thin flexible wall portion, the said thin wall portion having a split or opening made therethrough to divide this wall into two parts both of which are adjustable by distortion to force the two thin wall parts outwardly into a new position parallel with the heavy wall.

9. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket, comprising a shank, a web made integral with the shank, a pair of wings, each wing consisting of a flat section terminating in a curved wall, and the said curved wall being integrally joined with the web.

10. An adjustable attachment for removable bridge work adapted to fit into a pier tooth socket, comprising a shank, a web made integral with the shank, a pair of wings, each wing consisting of a flat section terminating in a curved wall, and the said curved wall being integrally joined with the web whereby a cylindrical opening is made at the juncture of the wing and web for the reception of a distortion tool whereby the diameter of the curved wall is somewhat increased to displace the wing to a new position parallel with the web.

In testimony whereof, I have hereunto affixed my hand and seal this 12th day of September, 1921, in the city of New York, borough of Manhattan, county of New York, State of New York.

ISIDORE STERN.