

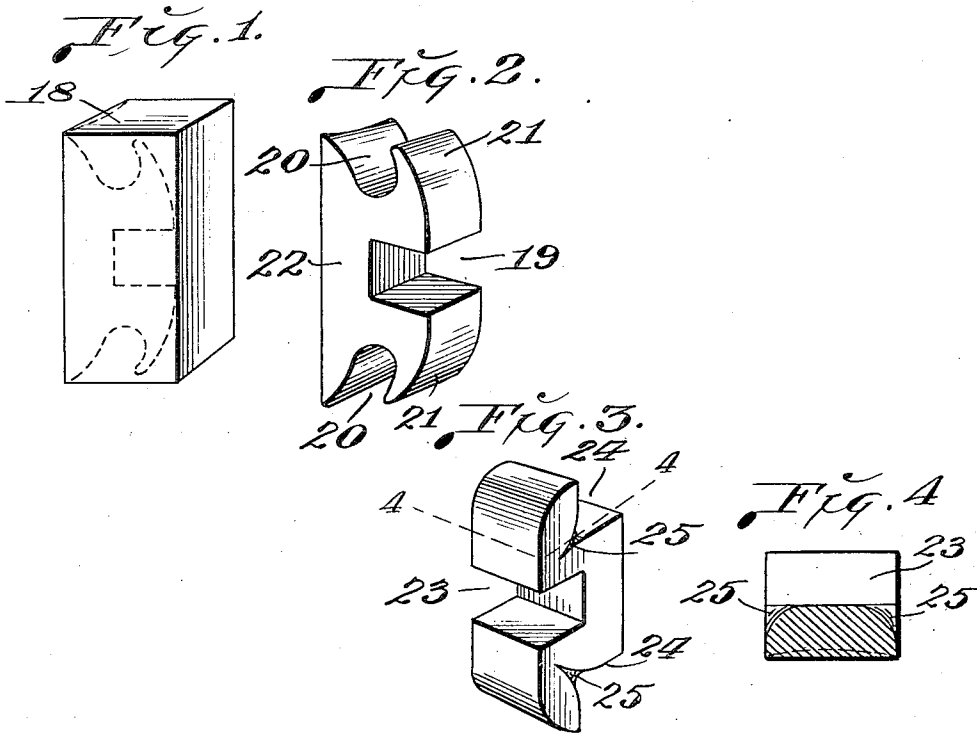
Oct. 9, 1934.

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1,976,141

METHOD OF PRODUCING ORTHODONTIC BAND BRACKETS

Filed June 1, 1932



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UNITED STATES PATENT OFFICE

1,976,141

METHOD OF PRODUCING ORTHODONTIC BAND BRACKETS

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Application June 1, 1932, Serial No. 614,703

3 Claims. (Cl. 29—160.6)

My invention relates generally to the art of
correcting the position of malposed teeth of the
dental arch and more particularly to the methods
of construction and production of the brackets
that are attached to the tooth engaging bands
and which brackets are constructed and shaped
so as to conveniently receive the arch bars, liga-
tures and wires that are utilized for imparting
the desired stresses and strains to the teeth that
are to be rotated or moved to the proper or de-
sired positions with respect to the other teeth of
the dental arch.

It will be understood that orthodontic appli-
ances of the character to which my invention re-
lates and particularly the brackets that are ap-
plied to the tooth bands, are relatively small in
size and that said brackets are subjected to con-
siderable strains and stresses while in service and
it is one of the principal objects of my invention
to provide a method of producing the brackets so
that the strength of the metal of which said
brackets are formed, is utilized to the maximum
degree in resisting the strains and stresses that
are impressed upon the brackets while the same
are in service.

Further objects of my invention are, to provide
a method of producing orthodontic tooth band
brackets having great strength and rigidity and
the metal therein being disposed so as to resist
to a maximum degree the tendency of the arch bar
to rotate within the slot that is formed in the
bracket for the reception of said arch bar.

A further object of my invention is, to provide
an improved method of forming orthodontic
brackets so that the same will not yield and bend
to such a degree as to permit the arch bar re-
ceiving notch to open or spread apart under tor-
sional stresses imparted to said bracket by the
arch bar that passes through the notch therein
or as a result of tilting movement of the bracket
itself as a result of movement of the tooth that is
engaged by the band that carries said bracket.

With the foregoing and other objects in view
my invention consists in certain novel methods
of construction and arrangements of parts that
will be hereinafter more fully described and
claimed and illustrated in the accompanying
drawing in which:

Fig. 1 is a perspective view of a block of metal
that is utilized for the production of a bracket by
my method and which latter is provided with an
arch bar receiving notch and with a pair of op-
positely arranged ligature receiving notches and
hooks.

Fig. 2 is a perspective view of a completed

bracket formed by my method having in its front
central portion an arch bar receiving notch and
with ligature receiving notches and hooks at its
ends.

Fig. 3 is a perspective view of a modified form
of the bracket.

Fig. 4 is a horizontal section taken on the line
4—4 of Fig. 10.

In practicing my improved method to form a
bracket of the type illustrated in Fig. 2, the
bracket is formed from a substantially rectangu-
lar solid block 18 of alloy or platinized metal that
is very hard and tough and formed in the inter-
mediate portion of this block and extending from
one of the faces thereof approximately half
through the block, is a horizontally disposed notch
or slot 19 that is adapted to receive an arch bow
and the ends of the block above and below
this notch are machined or cut to form
transversely disposed notches 20 and those por-
tions of the ends of the block above and
below notch 19 and which overlie the notches
20, are curved rearwardly as designated by
21 in order to form hooks to facilitate the
attachment of ligatures to the bracket and
to the arch bow that is seated therein and to
retain said ligatures in proper position within the
notches 20, especially while the ligatures are being
applied to the bracket.

The transverse arch bow receiving notch 19
extends approximately half way through the body
of the bracket and as a result a wall or body 22
of substantial thickness is provided between the
inner end of the notch 19 and the rear face of
the bracket, which latter is soldered or brazed to
the tooth band and thus the solid base of the
bracket reinforces the band at the point of at-
tachment of the bracket thereto and at the same
time the necessary strength and rigidity is pro-
duced in the jaws of the bracket or those portions
above and below the slot 19 to resist the spread-
ing apart of the jaws of the bracket as a result of
the development of torsional strains between the
bracket and the engaged arch bow.

In the modified construction illustrated in Figs.
3 and 4, the bracket is formed from a solid rec-
tangular block of alloy or platinized metal with
a transverse notch 23 formed in the front por-
tion of the block for the reception of an arch bar
and with the upper rear corners of the block
cut away to form notches 24 for the reception of
ligatures or the like.

At the ends of the inner corners of the notches
24, the metal in the bracket is cut away and
rounded as designated by 25, in order to elimi-

nate sharp edges that would otherwise tend to cut the ligatures that are engaged on the ends of the brackets.

Inasmuch as my improved method contemplates the cutting of the brackets from solid blocks of metal, the molecules and fibres of the metal in all parts of the finished bracket retain their original relative positions, thus insuring the greatest possible strength of the metal that is utilized for forming the brackets and likewise the greatest possible resistivity to strains and stresses that are developed while the brackets are in service.

In all cases the base or rear portions of the brackets and particularly those portions to the rear of the transverse notches that are formed in the front portions of the brackets, are made of substantial thickness, thereby imparting to the brackets the requisite strength to resist torsional strains that would otherwise tend to spread the jaws of the bracket apart and at the same time the relatively strong heavy base portions of the brackets serve to reenforce the tooth bands to which the brackets are braced or soldered and thereby provide an attachment of increased strength and stability.

The machining or cutting of the bracket from a solid block of metal eliminates the necessity for bending any portion of the bracket during its production and which bending it will be understood necessarily disturbs, stretches, expands and in some instances fractures, the metal at the bending points with the result that the finished structure is materially weakened and it fails to produce the expected and desired results when applied for use.

The size of brackets utilized on tooth bands of orthodontic appliances precludes the possibility of their being successfully manufactured by dies and I have demonstrated in tests and experiments that dies, though very carefully constructed, cannot impart the necessary accuracy to the finished product, particularly in the formation of the notches that receive the arch wires, ligatures and the like.

I have demonstrated in practice that where metal is bent in the production of orthodontic brackets and particularly relatively hard and tough metal, there is tendency of the bent portion of the metal to fracture and the grains or molecules of the metal separate so that the bent portion becomes porous and thereby loses its strength and resistivity to service strains and stresses.

The form of bracket illustrated in Figs. 1 and 2, is particularly advantageous inasmuch as the formation of the hooks or brackets 21 permits the ligatures to be readily applied to the bracket and to the arch bow that is supported thereby and the ligatures are retained in position within the curved notches 20 both while being applied to the bracket and after being properly connected thereto and to the arch bow.

In order that the rear or base faces of the brackets may conform to the curvature of the

tooth band when the same is applied to a tooth, said rear faces may be formed slightly concave as illustrated in Fig. 2 and when the brackets are so formed the concave faces will fit snugly against the band when soldered or brazed thereto and when the band is applied to the rounded contour of a tooth, there will be no strains impressed on the joint between the bracket and band.

Orthodontic brackets constructed in accordance with my improved method are exceptionally strong and rigid, serve to reenforce the tooth band to which they are soldered or brazed and as said brackets are formed from solid blocks of metal they are not bent during manufacture, the maximum strength of the metal forming the brackets is utilized to the greatest advantage in resisting tendency of the jaws of the brackets to open as a result of relative torsional strains between the brackets and the arch wires that are applied thereto.

It will be understood that minor changes in the method of constructing of the various parts of my improved orthodontic band bracket may be made and substituted for those herein shown and described without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. The herein described method of producing a one piece orthodontic band bracket, which consists in simultaneously cutting a transverse and substantially parallel slot in each of the top and end faces of a block of hard tough metal, said cutting of said block in each instance being so effected as to retain the fibers and molecules in the uncut portions of said block in their original positions without distorting and stretching the same.

2. The herein described method of producing a one piece orthodontic band bracket, which consists in first cutting a transverse slot in the top face of a block of hard tough metal and then simultaneously cutting transverse slots in the end portions of said block and substantially parallel to said first slot, said cutting of said block in each instance being so effected as to retain the fibers and molecules in the uncut portions of said block in their original positions without distorting and stretching the same.

3. The herein described method of producing one piece orthodontic band bracket, which consists of cutting a transverse arch bar receiving notch in the front face of a rectangular block of tough, hard metal, said notch having a depth of substantially one half the thickness of said block, cutting the end portions of said block to form a pair of curved and identical, ligature receiving notches, cutting away the rear face of said block to produce a concave surface, and the said cutting of said block in each instance being so effected as to retain the fibers and molecules in the uncut portions of said block in their original positions without distorting and stretching the same.

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