Feb. 14, 1950 E. B. MOLLER 2,497,229

DENTAL FORCEP

Filed Oct. 9, 1947 2 Sheets-Sheet 1

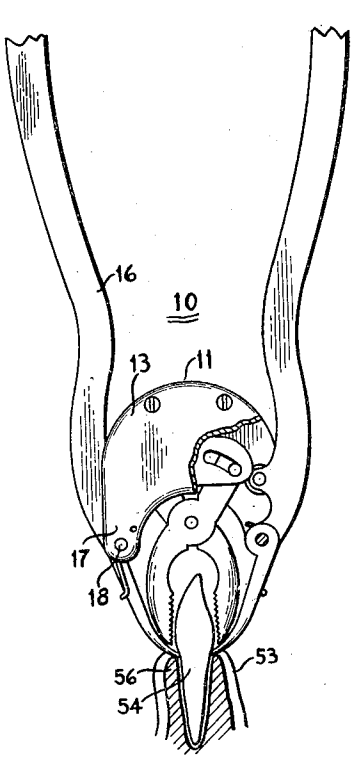


Fig. 1

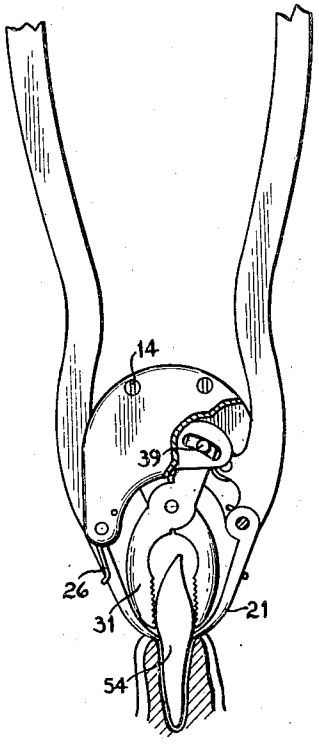


Fig. 2

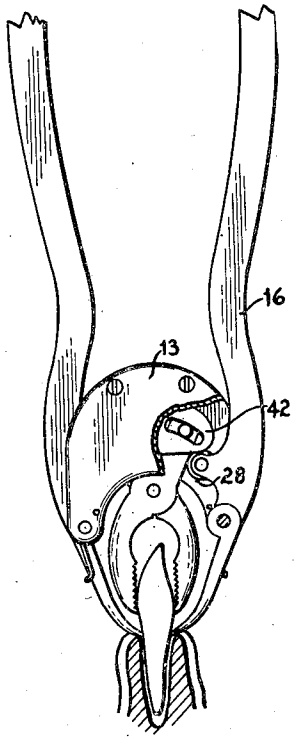


Fig. 3

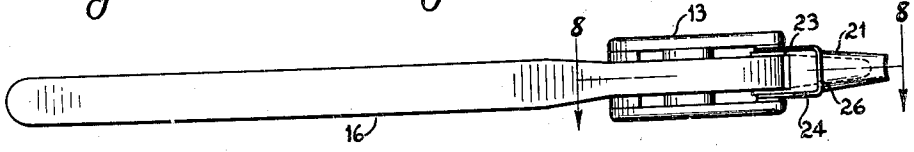


Fig. 4

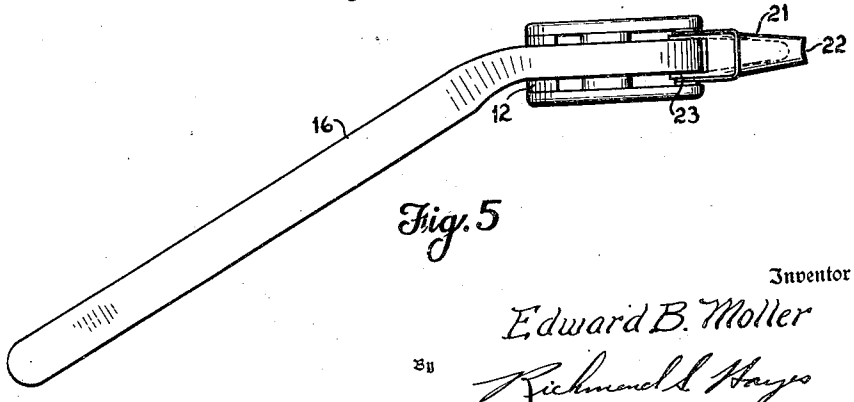


Fig. 5

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DENTAL FORCEP

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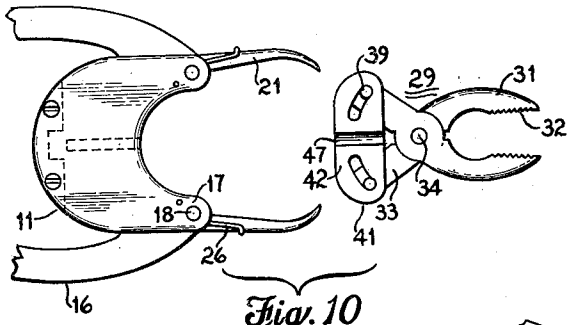


Fig. 10

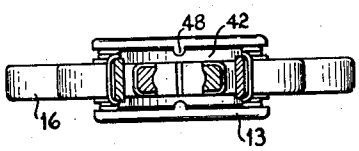


Fig. 9

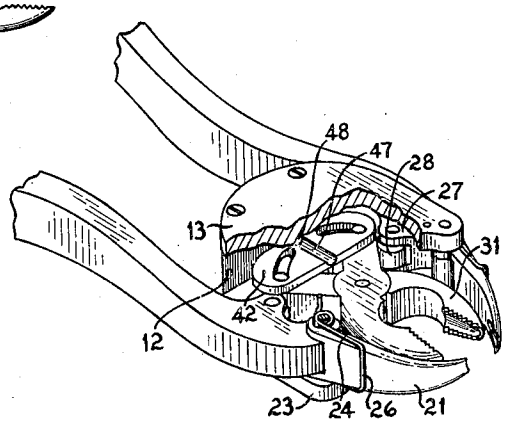


Fig. 6

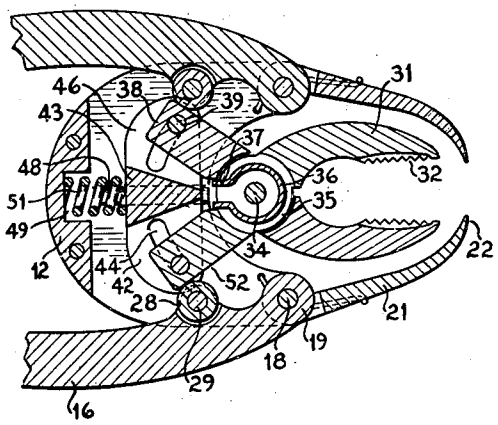


Fig. 8

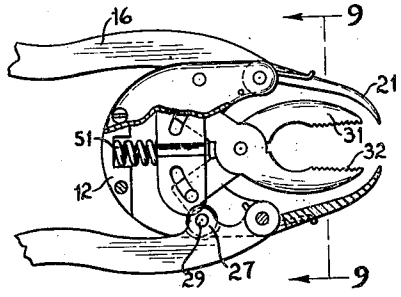


Fig. 7

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UNITED STATES PATENT OFFICE

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DENTAL FORCEP

Edward B. Moller, Falconer, N. Y.

Application October 9, 1947, Serial No. 778,890

9 Claims. (Cl. 32—62)

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This invention relates to improvements in dental forceps, and more particularly to the provision of means by which tooth extraction may be rendered less painful to a patient through the employment of means adapted to loosen the tooth in such manner as to prevent material damage to the area surrounding the tooth or the tooth itself.

More specifically the invention is directed to an instrument in which two separate sets of beaks are provided, one set being located between the beaks of the other set. The outer set of beaks is intended to engage the alveolar process, whereas the inner set of beaks is adapted to have clamping engagement with the tooth. A pair of handles are so associated with the two sets of beaks that, when these handles are drawn toward each other, the process beaks serve to provide a support to enable the tooth engaging beaks to not only have clamping engagement with the tooth, but move in the direction of the handles. Thus, when the instrument is operated, the two sets of beaks exert equal force in opposite directions.

It is an object of the invention to provide forceps which may effect the loosening and removal of teeth without requiring twisting or turning at any time during the operation of extraction.

It is another object of the invention to provide forceps in which one set of beaks exerts pressure against the process equal, but opposite, to the force required by the other set of beaks in the extraction of a tooth.

Another object of the invention lies in the provision of forceps which, through the direction of movement of the operative parts that effect the extracting of a tooth, tend to prevent breaking or splintering.

A still further object of the invention lies in the provision of forceps that include a readily interchangeable unit embodying operable tooth engaging beaks.

Other objects and advantages of the invention will be more fully understood from a consideration of the following specification, taken in conjunction with the accompanying drawings, and in which

Figs. 1, 2, and 3 are side elevational views of one form of the invention, showing various positions of the movable parts during a tooth loosening operation, a portion of the casing in each of these figures being broken away to better disclose certain of the structural details;

Fig. 4 is an edgewise view of the structure shown in Fig. 1;

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Fig. 5 is a view similar to Fig. 4, showing the handles bent to better facilitate the extraction of certain teeth;

Fig. 6 is an enlarged fragmentary perspective view, partly in section;

Fig. 7 is a fragmentary side elevational view, partly in section;

Fig. 8 is an enlarged sectional view, taken substantially on the line 8—8 of Fig. 4;

Fig. 9 is a head end view, partly in section, being taken substantially as indicated by the line 9—9 of Fig. 7; and

Fig. 10 is a fragmentary side elevational view showing the tooth clamping unit removed from the casing in which it is adapted to function.

Referring more particularly to the drawing, the reference numeral 10 is employed to generally designate dental forceps embodying one form of the invention. The forceps include a casing 11 which, in the present instance, is formed by a base block 12 and cover plates 13. When the block and plates 12 and 13 are suitably joined by screws 14, the plates 13 are spaced apart and capable of receiving corresponding ends of the forceps handles 16. The plates 13 are formed with spaced wings 17, the corresponding wing of each plate being connected by a pivot pin 18. Each of the handles 16 is formed with a transversely apertured end boss 19, through which pin 18 projects to pivotally join the casing and handle. A pair of beaks 21 are formed at one end with process engaging shoulders 22, and at the other end, with a pair of spaced apart wings 23 which, as may be seen in Fig. 4, are adapted to provide a space in which the boss 19 of the handle 16 may fit. Of course, the wings 23 are also apertured to receive the pin 18 and, thus, one handle and one beak are pivotally connected to the wing-like portion of each side of the casing 11. As will hereinafter be more fully understood, it is desired that the beaks 21 be normally urged to a position such that the shoulders 22 of the free ends thereof are in near proximity, and one means by which this relative position of the beaks may be obtained is through the use of springs 24 which, as may be seen in the drawing, encircle a free area of the pin 18 and include a U-shaped portion 26 that bears against the outer surface of the beak. Each handle 16, adjacent the boss 19, is formed with an inwardly extending pair of lugs 27 between which is located a roller 28. A pin 29 serves to mount the roller of each handle substantially in the position shown in various figures of the drawing.

The casing 11 is intended to receive a unit 29

which includes a pair of beaks 31 having tooth engaging jaws 32. These beaks have crossed arms 33 that are pivotally joined by a pin 34. A portion of the area of each arm that surrounds the pin 34 is cut away to provide a cavity 35 (see Fig. 8). Mounted in this cavity is a flat, circular spring 36 having flanged ends 37 adapted to contact adjacent portions of the arms 33 in a manner and for the purpose of urging the jaws 32 into open or spaced apart relationship. The base ends 38 of each of the arms 33 are provided with transversely arranged pins 39. A mount 41 for the beak arms 33, in the present disclosure, takes the form of a pair of plates 42 that are spacedly joined midway of their length by an integral or permanently attached block 43. Each plate is formed with a pair of slots 44 arranged in an arch about pin 34 as a center. The end portions of the arms 33 are located in the open-ended slots 46 formed by the plates 42, and pins 39, carried by these arms, project into and are movable the length of slots 44. Under urging of the spring 36, the arms will normally occupy the position shown in any of several of the figures such, for example, as Figs. 6 and 10. Midway of the length of each of the plates 42, a transverse recess 47 is formed. A corresponding rib 48 is formed on the inner face of each of the cover plates 13 of the base. Thus, when the unit 29, carrying the tooth engaging beaks, is mounted in the casing 11, it is guided into proper position by the interfitting of recesses 47 and ribs 48. As may be observed in Fig. 8, the base block 12 is formed with a recess 49 in which is located one end of a coiled spring 51. The other end of this spring abuts the solid, central portion 43 of the mount 41 and normally urges this mount into a position such that the outer surface 52 of arms 33 contact rollers 28.

Attention is now directed to the assembly and operation of the device. It will be understood that the unit 29 is only one of several such units it is contemplated to interchangeably mount in the casing 11. These units will each be provided with a different size or shaped pair of beaks. The mount 41, however, will be substantially as described in order that it may readily be inserted and removed in the casing. Of course, the purpose of providing a removable and replaceable unit is to enable the use of the present invention in the extraction of teeth regardless of their location or size. Referring particularly to Fig. 10 of the drawing, it will be observed that the process engaging beaks 21 are spread apart sufficiently to permit entry therebetween of the unit 29 for the purpose of mounting this unit in the casing. For purposes of clarity, the beaks 21 are shown as though they were held apart against tension of springs 26, it being understood of course that their normal position is substantially as shown in the other views of the drawings. The length of the plates 42 of the mount 41 is greater than the space between the bosses 19 of the handles and, thus, the mount must be tilted to first project one end behind one lug and then moved sufficiently into the casing to permit entry of the other end past the boss of the other handle. When the unit 29 has been thus far assembled, the recesses and ribs 47 and 48 are aligned and the unit may now be moved into a position such that the bottom of the block 43 abuts the spring 48. Should the rollers 28, carried by the handles 16 interfere with moving the unit 29 to its proper place in the casing, the handles may be swung somewhat apart in order that the ends of the arms 38 may clear these rollers. Of course, when

it is desired to remove the unit 29, the reverse of the assembly procedure is carried out.

It will be found, in the operation of the device, that the forceps may be positioned with respect to a tooth to be extracted, substantially as shown in Fig. 1. Herein the beaks 21 are shown to have cut into or depressed the gum 53 to an extent that they yieldingly contact the tooth 54 and abut the process 56. Of course, this positioning of the process engaging beaks is obtained with the handles of the forceps in a somewhat spread apart position. It will be noted that the ends of the tooth engaging beaks 31 are in close proximity with the ends of the beaks 21 and are not in engagement with the tooth 54. However, as the handles 16 of the instrument are drawn together, the beaks 31 move into clamping engagement with the tooth 54 (see Fig. 2). Further drawing together of the handles 16 causes the unit 29 to be drawn inwardly into the casing 11 a sufficient distance to loosen the tooth from its socket. Once the tooth has been loosened, the entire instrument is moved and the tooth is successfully extracted.

Referring again to Figs. 1 and 8, which show the various movable parts of the instrument in the same relative positions, it will be noted that the surfaces 52 of arms 38 are in contact with rollers 28 through the action of spring 37, and that the pins 39 of these arms are at the outermost ends of their respective slots 44. As the handles 16 are drawn together to an extent such as shown in Fig. 2, the rollers act to pivot the arms about pin 34, bringing the jaws 32 into clamping engagement with the tooth. Further drawing together of the handles 16 continues the pressure of rollers 28 against the arm surfaces 52. However, since the beaks 31 are already in clamping engagement with the tooth, there can be no further pivoting of arms 38, and thus, the action of the rollers 28 effects movement of the unit 29 in a direction to move further into the casing 11 in which it is mounted. Such movement is, of course, clearly indicated in Fig. 3. Should the tooth 54 be of larger proportions, the withdrawal of the unit into the casing will be effected before the pins 39 of the arms have traveled to the extent shown in Figs. 2 and 3. Again, if a tooth smaller than the one illustrated is to be extracted, pins 39 will have moved beyond their travel shown in slots 44. In any event, as soon as the tooth is gripped by the beaks 31 and their respective arms may no longer move about their pivot 34, the entire unit, by continued squeezing of the handles, must move inwardly of the casing. Particular attention is directed to the fact that the instrument, during the operation of loosening a tooth, is not moved or twisted. The action by which the tooth is loosened is such that equal force in opposite directions is exerted on the process through beaks 21 and on the tooth by means of beaks 31.

Although applicant has shown and described only one form of his invention, it will be apparent that variations in the structure of the two sets of beaks and other parts may be altered or modified insofar as such alteration or modification is within the spirit and scope of the invention as set out in the annexed claims.

Having thus set forth my invention, what I claim as new and for which I desire protection by Letters Patent is:

1. A dental forceps comprising a casing, a pair of handles separately and individually pivotally joined to said casing, a pair of process engaging

beaks joined to said casing, a pair of pivotally connected tooth engaging beaks located between said process engaging beaks and movably carried by said casing, and means operable to move said tooth engaging beaks away from said process engaging beaks by movement of said handles toward each other.

2. A dental forceps comprising a casing, a pair of handles individually pivotally joined at corresponding ends to said casing, a pair of process engaging beaks joined to said casing, a pair of tooth engaging beaks having pivotally connected arms located in said casing, and means, operable by movement of said handles, for positively moving said arms to move said tooth engaging beaks toward the pivotal ends of said handles and away from said process beaks.

3. A dental forceps comprising a casing, a pair of handles pivotally joined to said casing, a pair of process engaging beaks individually pivotally joined to said casing, means yieldingly urging the free ends of said beaks into close proximity, a pair of convergeable tooth engaging beaks having their jaw ends in close proximity with the ends of said process engaging beaks, means mounting said tooth engaging beaks for movement with respect to said casing, and other means operable by said handles to move said tooth engaging beaks out of close proximity with said process engaging beaks.

4. A dental forceps comprising a casing, a pair of handles individually pivotally joined to said casing, a pair of process engaging beaks joined to said casing and extending beyond and in the same general direction of said handles, a pair of pivotally connected tooth engaging beaks normally in close proximity with said process beaks, said beaks having portions located in said casing, said beaks in their entirety being adjustable with respect to said casing and means operable by movement of said handles to engage said portions and first pivot said tooth engaging beaks and second withdraw them from proximity with said process engaging beaks.

5. In a dental forceps having a casing, a pair of handles individually pivotally joined to said casing, and a pair of process engaging beaks pivotally joined to said casing and extending therebeyond and in substantially the general plane of said handles; a removable unit including a pair of pivotally joined arms having tooth engaging beaks, means normally mounting said unit in said casing to locate said tooth engaging beaks between and in close proximity with said process engaging beaks, and other means operable by movement of said handles to engage said arms and move said tooth engaging beaks in the direction of the length of said forceps and away from said process engaging beaks.

6. In a dental forceps having a casing, a pair of handles individually pivotally joined to said casing, and a pair of process engaging beaks pivotally joined to said casing and extending therebeyond and in substantially the general plane of said handles; a removable unit adapted to be mounted in said casing, said unit including

a pair of pivotally connected arms, tooth engaging beaks at corresponding ends of said arms, means in said unit for limiting the relative pivotal movement of said arms, and means carried by said handles engageable with and adapted to pivotally move said arms in a direction to move said tooth engaging beaks toward each other.

7. In a dental forceps having a casing, a pair of handles individually pivotally joined to said casing, and a pair of process engaging beaks pivotally joined to said casing and extending therebeyond and in substantially the general plane of said handles; a unit adapted to be mounted in said casing, said unit comprising a pair of pivotally connected arms, tooth engaging beaks at corresponding ends of said arms, said tooth engaging beaks being normally in close proximity with said process engaging beaks, means in said unit for limiting the relative pivotal movement of said arms, and means carried by said handles engageable with and adapted to successively pivot said arms and move said unit in a direction to withdraw said tooth engaging beaks from proximity with said process engaging beaks.

8. In a dental forceps having a casing, a pair of handles individually pivotally joined to said casing, and a pair of process engaging beaks pivotally joined to said casing and extending therebeyond and in substantially the general plane of said handles; a unit adapted to be mounted in said casing, said unit comprising a base, a pair of pivotally connected arms, given ends of said arms being mounted in said base, the other ends of said arms having tooth engaging beaks, means normally urging said tooth engaging beaks into open relationship, and means, associated with said handles, operable to engage said given ends, to move said unit inwardly of said casing and effect pivotal movement of said arms to bring said beaks into tooth engaging relationship.

9. In a dental forceps having a pair of handles pivotally mounted at corresponding ends and a pair of individually and separably pivotal process engaging beaks; a pair of convergeable tooth engaging beaks having their jaw ends located between and normally in close proximity with said process engaging beaks and also having portions in contact with the pivotal ends of said handles, said handles being pivotally movable toward each other to move said portions and effect movement of said tooth engaging beaks away from and out of proximity with said process engaging beaks.

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REFERENCES CITED

The following references are of record in the file of this patent:

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