

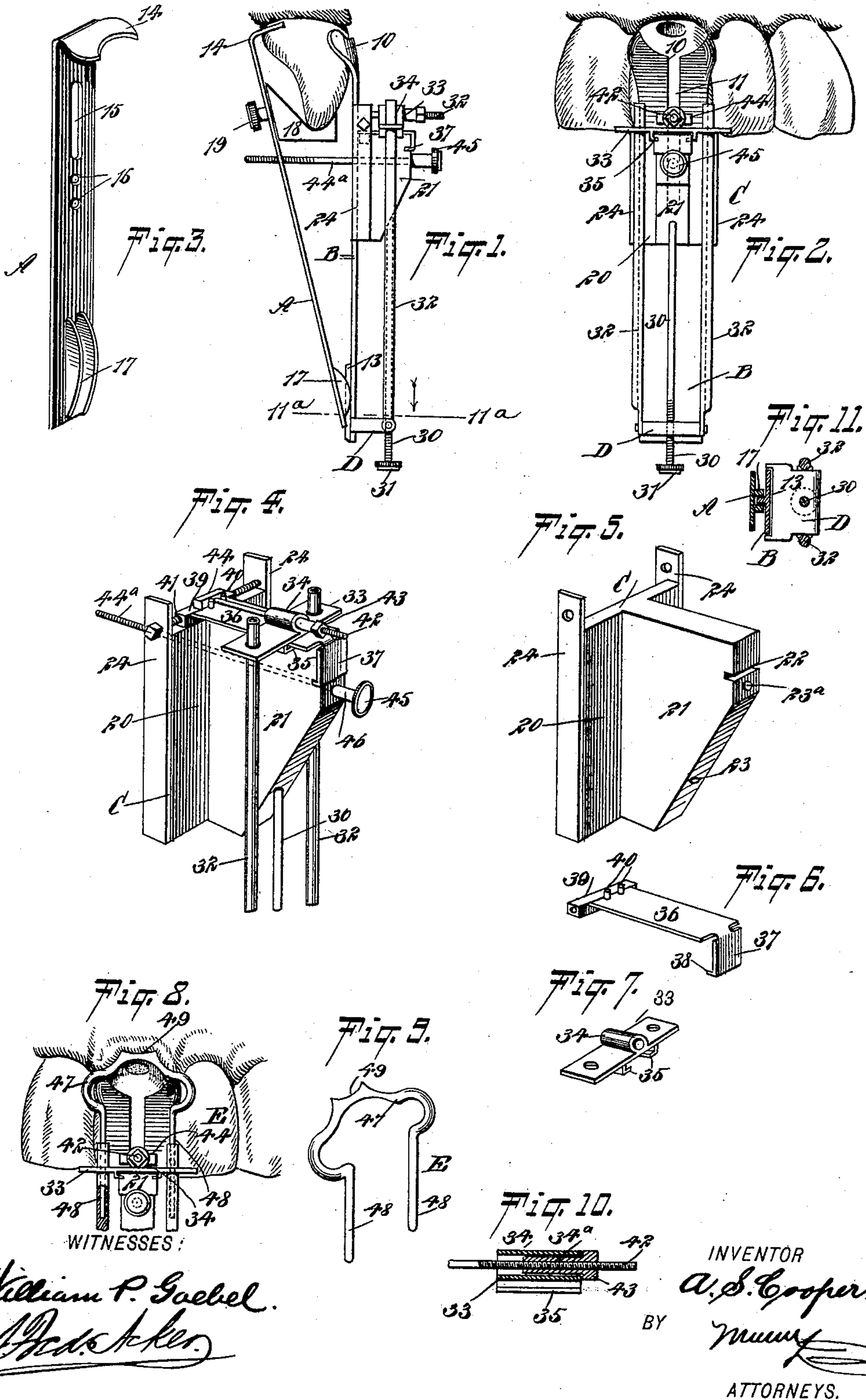
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Patented Dec. 13, 1898.

A. S. COOPER.
ADJUSTABLE DENTAL RUBBER DAM CLAMP.

(Application filed July 28, 1898.)

(No Model.)



WITNESSES:

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ADJUSTABLE DENTAL RUBBER-DAM CLAMP.

SPECIFICATION forming part of Letters Patent No. 615,808, dated December 13, 1898.

Application filed July 28, 1898. Serial No. 687,062. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR S. COOPER, of McMinnville, in the county of Yamhill and State of Oregon, have invented a new and Improved Adjustable Dental Rubber-Dam Clamp, of which the following is a full, clear, and exact description.

The object of my invention is to provide a dental rubber-dam clamp which may be expeditiously and conveniently applied and so constructed that it may be adjusted to meet any emergency.

A further object of the invention is to provide a clamp which will grasp and tightly hold the tooth to which it is applied, regardless of the location of the cavity, and to provide a means whereby an adjustable arm can be employed in connection with the clamp for working purposes, the arm and the clamp being adjustable vertically and laterally and to and from the tooth to which the device is applied.

The object of the arm is to hold the rubber dam closely to the tooth around the edges of the cavity and clear of the cavity.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improved device applied to a tooth. Fig. 2 is a front elevation of the device. Fig. 3 is an inner face view of one of the clamping-plates of the device. Fig. 4 is a detail perspective view drawn on an enlarged scale, showing the upper portion of the device, the clamping-plates being removed. Fig. 5 is a detail perspective view of the head-block of the upper portion of the device shown in Fig. 4. Fig. 6 is a detail perspective view of one of the adjusting plates or slides of the device, and Fig. 7 is a detail perspective view of a second adjusting-plate adapted to cooperate with the plate shown in Fig. 6. Fig. 8 is a detail view showing a partial front elevation of the arm for holding the dam. Fig. 9 is a detail perspective view of the arm for holding the dam. Fig. 10 is a detail sectional view of the lateral

adjusting device, and Fig. 11 is a section on the line 11^a 11^a of Fig. 1.

That portion of the device which is adapted to be brought directly in engagement with the tooth consists of two clamping-plates A and B, and these plates are placed usually at angles to one another. The plate B is provided with a jaw 10 of such size and shape that it will conform to the exterior contour of different teeth, and the clamping-plate B is provided with a longitudinal slot 11, extending from the upper portion of the jaw a predetermined distance in direction of the lower end. A rib 13 is formed upon the central portion of what may be termed the "inner" or "back" face of the clamping-plate B, as shown particularly in Figs. 1 and 11.

The cooperating clamp A is shown in detail in Fig. 3 and is provided at its upper end with a jaw 14, adapted to conform to the shape of teeth at the gum margin on the inside of the tooth, and near the upper portion of the clamping-plate A a longitudinal slot 15 is formed, below which apertures 16 are made, while upon the front face of the said clamping-jaw A two longitudinal ribs 17 are produced, adapted to receive between them the single rib 13 on the opposing clamping-plate B, as illustrated in Fig. 1. The rear clamping-plate A is longer than the forward clamping-plate B, and the said rear clamping-plate A is provided with a block 18 upon its front face, which block is adapted to engage with the point or crown of a tooth and is secured in adjusted position by means of a screw 19, passed through the slot 15 and into the aforesaid block 18, as is also shown in Fig. 1.

A head-block C is adapted to be secured to the forward clamping-plate B. This head-block, as shown in Figs. 4 and 5, consists of a plate 20, from the face of which a block 21 is projected, the block being located near the center of the said plate, and the block is provided at its forward edge near the top with a horizontal slot 22 and with an opening 23^a below the said slot, while the plate 20, to which the block is secured, is provided at each side with guide-plates 24, adapted to engage with the side edges of the forward clamping-plate B.

At the lower end of the forward clamping-plate B an adjusting-block D is located. The

adjusting-block D has guided sliding movement upon the forward clamp B, as shown in Fig. 11, and the vertical movement of the adjusting-block D is accomplished through the medium of a screw 30, which is passed through a suitably-threaded aperture in the adjusting-block, and the upper end of the adjusting-screw 30 is swiveled or is held to turn at 23, Fig. 5, in the lower portion of the block-section 21 of the head-block C, as shown in Figs. 1, 2, and 4. The lower end of the adjusting-screw 30 is provided, preferably, with a head 31 to facilitate the movement of the said screw.

A standard 32 is pivotally connected with each end of the adjusting-block D, and these standards are carried upward, one at each side of the block-section 21 of the head-block C, through openings in the shifting plate 33, the standards being free to move through the said shifting plate, and their upper ends are tubular, as shown in Fig. 8. The shifting plate 33 is located transversely of and above the block-section 21 of the head-block, as shown in Fig. 4, and is provided at its center upon its upper face with a transverse integral sleeve 34, and upon the under face of the shifting plate 33 bracket-lugs 35 are secured, in which bracket-lugs the horizontal member of a second shifting plate 36 is mounted to slide. The second shifting plate 36 is provided at its forward end with a downwardly-extending flange 37, adapted to pass along the front upper face of the block-section of the head-block, and is further provided at its bottom with a horizontal flange 38, adapted to enter the horizontal slot 22 in the said head-block section 21, as is also shown in Fig. 4, while at the rear end of the horizontal portion of the second shifting plate 36 a nut 39 is secured or made integral therewith, and pins 40 are located upon the upper face of the horizontal section of the shifting plate 36, adjacent to the said nut 39, as illustrated particularly in Fig. 6.

A screw 41 is passed through the side pieces 24 of the head-block above the upper edge of the body 20, and the said screw is passed through the nut 39 of the shifting plate 36. Thus it will be observed that by manipulating the screw 41 the shifting plate 36 will be horizontally and laterally adjusted and will carry with it the first-named shifting plate 33, and consequently the standards 32. The necessary movement of the standards is slight and is allowed for by the resiliency of the material of which the standards are made.

The adjusting-plate 33 is adapted to impart forward and rearward movement to the uprights 32, and such adjustment is brought about through the medium of an adjusting-screw 42, which is passed through an auxiliary interiorly-threaded sleeve 34^a, loosely fitted in the sleeve 34 on the plate 33 and secured to a block 44, located upon the nut 39, immediately back of the guide-pins 40, the adjusting-screw 42 passing between the said

guide-pins, while at the forward end of the adjusting-screw 42 a head 43 is provided for the auxiliary sleeve 34^a. Another adjusting-screw 44^a is passed through the opening 23^a in the block-section 21 of the head-block and through the front clamping-plate B into one of the apertures 16 in the rear clamping-plate A, the wall of which aperture is threaded, and the adjusting-screw 44^a is provided at its forward end with a fixed collar 46 and with a head 45.

In connection with the clamps A and B an arm E is employed, adapted for detachable connection with said clamps and for holding the rubber dam free or away from the cavity to be treated, as shown in Fig. 8. This arm consists of a body portion 47, adapted to fit the surface of the tooth at which the cavity is to be treated, and legs 48, which enter the upper tubular portions of the adjustable standards 32.

In the operation of the device the screw 44^a is loosened, so as to provide for a proper distance between the clamping-plates. The clamping-plates are then fitted to the tooth to be operated upon, and the head 45 of the adjusting-screw 44^a is manipulated to close the clamping-plates upon the tooth. Next the standards 32 are made to receive the arm E intended to be used, and said standards are adjusted vertically, laterally, or forwardly or rearwardly through the medium of the adjusting devices heretofore described until the arm E shall have engaged the rubber dam and forced the same away from the cavity to be operated upon, as shown in Fig. 8. When the arm E is in the position above set forth, the body portion of the arm at the cavity will be above the same, enabling the dentist to operate upon the cavity below the inner edge of the body of the arm, as is also shown in Fig. 8.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A dental rubber-dam clamp, comprising a clamp adapted for engagement with a tooth, a dam-manipulating device carried by a member of said clamp and movable toward and from said member in the direction from front to rear, that is, in the common or transverse plane of the clamp members, and means for adjusting said dam-manipulating device toward and from said member in a forward or rearward direction.

2. In a dental rubber-dam clamp, a clamp consisting of two members, one having movable connection relative to the other, each member of the clamp being provided with jaws arranged for engagement with a tooth, a head-block carried by one member of the clamp, an adjusting device for the members of the clamp, carried by the said head-block, and standards pivotally supported from one member of the clamp, adapted to carry a dam-adjusting arm, and means for adjusting said

standards, vertically, laterally, forwardly and rearwardly, for the purpose specified.

3. In a dental apparatus, a rubber-dam clamp consisting of two members, each provided with a jaw arranged for engagement with a tooth, an adjusting device for the members of the clamp, an adjusting-block movable vertically upon one member of the said clamp, a head-block located upon the same member, standards pivoted to the adjusting-block and extending upward, one at each side of the head-block, and an adjusting mechanism, substantially as shown and described, carried by the head-block and arranged to impart to the said standards vertical, lateral, or forward or rear movement, for the purpose specified.

4. In a dental apparatus, a rubber-dam clamp, consisting of two clamping-plates, means for adjusting said clamping-plates to or from one another, one clamping-plate at the end removed from the tooth being arranged to have movement upon the opposite clamping-plate, and an adjusting-block capable of vertical movement upon one member of the clamp, an adjusting device for the said adjusting-block, a head-block carried by a member of the clamp, standards attached to the adjusting-block, a guide-plate for the said standards, a shifting device for the said guide-plate, a second plate having guided movement in the plate provided for the standards, and a shifting device for the said second plate, the arrangement of the said plates and their shifting devices being such that the standards may be moved vertically, laterally, or forwardly or rearwardly, as and for the purpose specified.

5. In a dental apparatus, a rubber-dam clamp consisting of clamping devices, standards carried by the clamping devices, means, substantially as described, for imparting vertical, lateral and a forwardly and rearwardly movement to the said standards, and a dam-adjusting arm comprising a body adapted for engagement with the dam, and legs arranged for detachable engagement with the standards, substantially as described.

6. A dental rubber-dam clamp, comprising a clamp adapted for engagement with a tooth, one of the clamp members being provided with a slideway extending from front to rear, that is, in the direction of a line connecting the two clamp members, and a slide mounted to move upon said slideway and carrying a dam-manipulating device.

7. A dental rubber-dam clamp, comprising

a clamp adapted for engagement with a tooth, one of the clamp members being provided with a slideway extending from front to rear, that is, in the direction of a line connecting the two clamp members, a slide mounted to move upon said slideway, standards connected with said slide and pivoted to the clamp member carrying the slide, and a dam-manipulating device carried by the said standards.

8. A dental rubber-dam clamp, comprising a clamp adapted for engagement with a tooth, one of the clamp members being provided with a slideway extending from front to rear, that is, in the direction of a line connecting the two clamp members, a slide mounted to move upon said slideway, an adjusting-block movable toward and from the slide upon the same clamp member that carries said slide, means for moving the adjusting-block upon said clamp member, standards pivoted to said adjusting-block and passing loosely through the said slide, so that the standards are capable of an independent vertical movement in the slide, and a dam-manipulating device carried by said standards.

9. A dental rubber-dam clamp, comprising a clamp adapted for engagement with a tooth, a shifting plate carried by one of the clamp members and movable laterally thereon, said shifting plate being provided with a slideway extending from front to rear, that is, in the direction of a line connecting the two clamp members, a slide mounted to move upon said slideway, means for adjusting the shifting plate and the slide, and a dam-manipulating device carried by the slide.

10. A dental rubber-dam clamp, comprising a clamp adapted for engagement with a tooth, a shifting plate carried by one of the clamp members and movable laterally thereon, said shifting plate being provided with a slideway extending from front to rear, that is, in the direction of a line connecting the two clamp members, a slide mounted to move upon said slideway, means for adjusting the shifting plate and the slide, an adjusting-block slidable vertically upon the same clamp member that carries the said shifting plate and slide, means for actuating said adjusting-block, standards pivoted to the adjusting-block and passing loosely through said slide, and a dam-manipulating device carried by the standards.

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