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DEVICE FOR CONSTRAINING THE TONGUE

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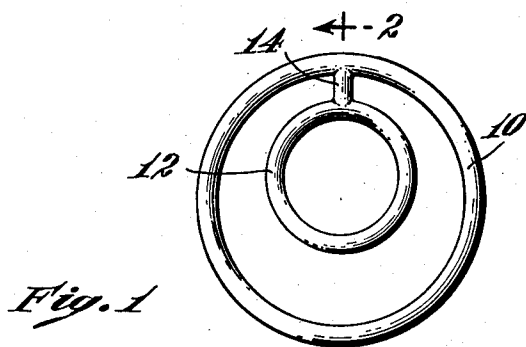


Fig. 1



Fig. 2

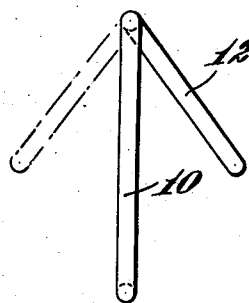


Fig. 3

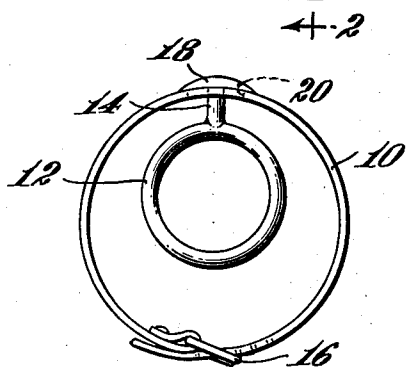


Fig. 4

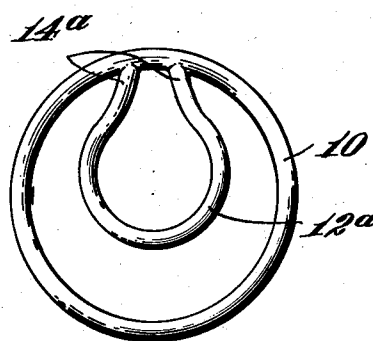


Fig. 5



Fig. 7

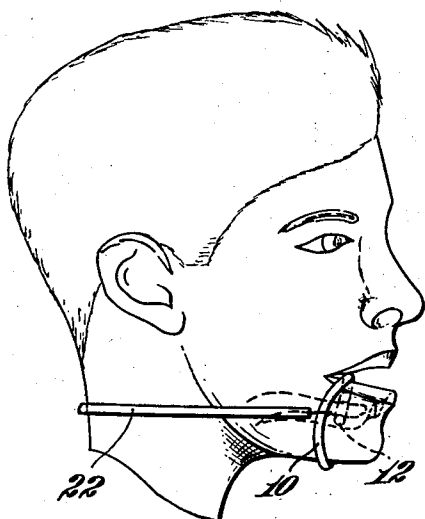


Fig. 6

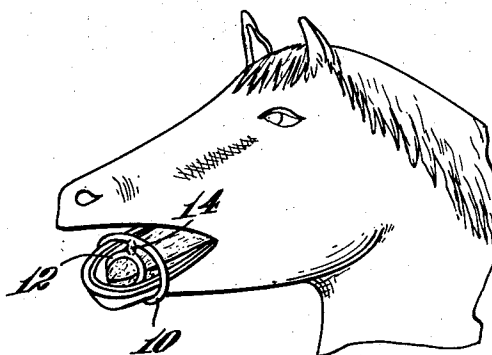


Fig. 8

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1

2,844,142

DEVICE FOR CONSTRAINING THE TONGUE

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6 Claims. (Cl. 128—12)

This invention relates to a device for use in constraining the tongue.

There are numerous instances when a person is rendered completely unconscious or semiconscious either purposely or by accident. Purposely for example, during physical and dental operations, child birth and the like; accidentally for example, by shock, fits, near drownings, asphyxiations and strangulations, blackouts and so forth. In each case there is always the danger that the tongue of the person involved will in its relaxed state fall backwardly so as partially or completely to block the tracheal passage thereby impairing entrance of air to the lungs or completely blocking the passage so as to cause suffocation. Because of this tendency for the tongue to block the throat, one of the first rules in every Red Cross manual, boy scout manual or other first aid manual dealing with the treatment of persons found unconscious is to open the mouth to determine the position of the tongue and if it has fallen back pull it forward and then turn the head to one side to prevent it from falling back again or in the case of drownings to place the person face down so that the weight of the tongue will tend to hold it forward. During operations it is quite common to hold the tongue in place by sewing it to the lip. Animals exhibit a corresponding tendency for the tongue to drop back into the throat and so cause strangulation or suffocation. This tendency is very marked in horses bred for racing prior to and during the course of a race. The condition arises from the highly nervous state of the horse which tends to cause congestion and partial loss of control of the tongue so that it falls over backward in the throat adding to the horse's difficulty in breathing and thus aggravating its nervousness. This phenomenon is so pronounced that it is customary prior to the race to tie a strand or twist of cloth tightly about the horse's tongue and about the lower jaw to hold it in place. If care is not taken the tightened strand usually cuts off free circulation so as to further congest the tongue and frequently at the end of the race it is blue. Such expedients are extremely painful to the horse and add to his agitation.

The principal objects of this invention are therefore to provide a device which may be used to hold the tongue of a man or animal in its normal position so that it cannot tip or fall back into a position to block or partially block the trachea when the person or animal is not in control of his senses or is only partially in control thereof. Another object is to provide a device that can be used to hold the tongue in a predetermined position during dental surgery, tonsillectomies and the like. Another object is to provide a device which may be worn comfortably by one engaged in a pursuit which may result in accidental blackout so as to hold the tongue in its normal position until consciousness is regained. Another object is to provide a very simple device which may be used by both skilled and unskilled persons for securing the tongue in its normal position after it has

2

been retrieved from a position blocking the throat. Another object is to provide a device which is simple and inexpensive enough to be included as a part of every piece of first aid equipment. Another object is to provide a device which is not only useful for man but may be used in the treatment of animals without modification in size. Another object is to provide a device which is especially useful in holding the tongue of a race horse in a forward non-strangling position during racing. Other objects are to provide a device which is inexpensive and easy to make, is adapted to fit any patient or horse without adjustment in size, which is comfortable and non-irritating when used and which may be applied easily.

As herein illustrated the device comprises a pair of loops of different size, the smaller of the loops being pendently supported within the larger loop and being comprised of an elastic substance. The loops normally lie in a common plane; however, the smaller loop is free to swing forwardly and rearwardly with respect to the plane of the larger loop, from side to side therein and to twist about its pendent axis. The larger loop is also elastic but may optionally be an inelastic member and may be provided with an adjustment to modify its size. The smaller loop is adapted elastically to receive the tongue and the larger loop is adapted to be placed about the lower jaw to hold the smaller loop centrally of the mouth. The smaller loop is so located with reference to the larger loop that it supports the tongue in its normal position and preferably the strand of which it is made has a convex inner side so that it is easy to slip onto the tongue. The support for the smaller loop is preferably a single strand which is axially flexible and also flexible in torque, although the smaller loop can be incompletely closed and connected at two points to the larger loop.

The invention will now be described with reference to the accompanying drawings wherein:

Fig. 1 is a plan view of the device;

Fig. 2 is a diametrical section taken on the line 2—2 of Fig. 1;

Fig. 3 is an edge view showing the smaller loop in full lines swung out of the larger loop to the right and in dot and dash lines swung out of the larger loop to the left;

Fig. 4 is a plan view of a modified construction in which the larger loop is inelastic and made adjustable;

Fig. 5 is a plan view of a modified construction in which the smaller loop is incompletely closed and is connected at two points to the larger loop;

Fig. 6 is an elevation of the device applied to a man with an auxiliary strand for assisting in keeping it in place;

Fig. 7 is a plan view of the auxiliary strand; and

Fig. 8 is an elevation of a horse's head showing the device partly in perspective.

Referring to the drawings the device comprises essentially a pair of loops 10 and 12 of different size arranged one within the other, the smaller loop being pendently supported from a portion of the larger loop in such fashion that while it normally occupies a plane corresponding to that of the larger loop it may be swung forwardly or rearwardly thereof as shown in Fig. 3 and/or may be twisted out of the plane of the larger loop about its pendent axis. In its preferred form the smaller loop 12 is pendently supported by a single strand 14 which is flexible axially and in torque so that the smaller loop is free to move in planes at right angles to each other with respect to the larger loop. The length of the strand 14 is less than the difference in radii of the loops and therefore supports the smaller loop eccentrically with respect to the larger loop.

Both loops 10 and 12 are necessarily flexible and the smaller loop is additionally elastic. In its preferred form the larger loop 10 is both flexible and elastic and when the entire device is made of elastic material a natural latex rubber may be employed, although it is to be understood that artificial elastic materials may be used in substitution therefor. The loops may be made by joining the ends of extruded lengths of rubber to form circular loops and then connecting the loops together with the smaller located inside the larger by means of a short length of the extruded material. Preferably the extruded rubber is in the form of a strand of circular cross section. The device may alternatively be molded by laying lengths of rubber stock in a mold cavity of proper shape, for example unvulcanized rubber latex and then closing the mold and supplying heat and pressure so as to vulcanize the stock and to connect the parts so as to form an integral part.

The cross section of the strands making up the loops are preferably round because the round surfaces are more easily applicable; however, they may have other shapes. For example, the strand may be half round with the round or convex surface on the inner side of the loop or they may be nearly flat, that is of rectangular cross section like an elastic band. The advantage that a loop having an inner surface which is round or convex has over a loop which has a flat inner surface is that the former will slide more easily over the member to which it is being applied than the latter and without tendency to twist. Since the inner loop is the one which must be applied primarily by sliding it in place, it is more important that it should have a convex inner surface than the outer loop which can be applied by stretching and/or adjustment to the jaw.

While the device is preferably made completely of an elastic material, the outer loop 10 (Fig. 4) may be comprised of a non-elastic, flexible material such as ordinary leather or tape of textile material having an adjustment intermediate its ends by which it may be fitted to the jaw of the wearer and drawn tightly in place. As shown the adjustment takes the form of a buckle 16 although it is to be understood that other forms of adjustment may be used with equally good results. The inner loop 12 is fastened to the strap or tape by means of a flexible strand 14 so that the same relation between the loops is secured as described with reference to Figs. 1 to 3 inclusive. In this instance since it would not be practical to vulcanize the strand 14 to the strap or tape it is provided with a button 18 molded thereto which may be engaged within a slit or eyelet 20 in the loop 10. Thus if the smaller loop 12 becomes worn or cut it may be easily replaced.

As described above the inner loop is suspended by a single strand from the outer loop; however, as illustrated in Fig. 5 the inner loop 12a may be incompletely closed for example, stirrup-shaped and be connected by two strand-like portions 14a to the outer loop 10 so as to provide substantially the same relation between the loops and substantially the same degree of flexibility and orientation of the inner loop with respect to the outer loop.

The diameter of the larger loop 10 is approximately $2\frac{3}{4}$ ", that of the smaller loop 12 approximately $1\frac{1}{4}$ " and the length of the strand 14 is approximately $\frac{1}{4}$ ". The strand diameter is approximately $\frac{1}{8}$ ". The foregoing dimensions are given by way of example only and are not intended to limit the scope of the invention in any way.

One special use of the device is for holding the tongue of a dental patient while the dentist is working on the teeth whether the patient is conscious or unconscious. For such use as illustrated in Fig. 6 the inner loop 12 is slipped over the tongue and then the outer loop 10 is placed about the lower jaw. The elastic nature of the outer loop will normally hold the device in place and

the proportions of the loops and the connecting link 14 are such that the tongue will be held substantially in its normal position at the bottom of the mouth. To hold the device securely in place an auxiliary strand or a band of elastic material 22 having hooks 24 at its opposite ends may be placed about the patient's neck with the hooks engaged with portions of the outer loop at the sides of the jaw. The elastic nature of the strand 22 holds the side portions of the loop 10 rearwardly in a somewhat curved position as shown in Fig. 6. If desired the ends of the strand 22 may be formed integral with the sides of the loop 10 as by molding them thereto.

When used in dentistry the device not only provides for holding the tongue in a suitable position but may also serve to assist in anchoring packings and other materials in the mouth during the dental operation by slipping end portions thereof between the loop and the tongue thus minimizing the danger of the packing slipping out of place and/or the possibility of the packing being accidentally swallowed.

As previously suggested the device has many uses in addition to dental work for example, it can be easily seen that this small element may be made a part of first aid equipment so that in the event of near drownings, asphyxiations, and other afflictions which render a person unconscious with the attendant danger that the tongue may fall back into the throat causing strangulation the device may quickly be applied to the tongue of the unconscious person to hold it forward thus enabling the rescuer to turn his attention to reviving the patient without constantly checking as to the position of the tongue or of having to place the patient's face down to be sure that the tongue will fall forwardly rather than backwardly into the throat. The device may also be made part of hospital equipment and used in the operating room to eliminate the heretofore common practice of having to stitch the tongue to the lip in order to prevent it from falling into the throat during operations. The device could also be used by aviators preparatory to making sustained dives at high speeds which frequently render them unconscious.

A very important use of the device apart from its use for humans is in horse racing. Race horses are extremely nervous and high strung because of their breeding and the excitement prior to and during the race and this nervous excitement or tension is reflected in considerable congestion of the horse's tongue accompanied by swelling which interferes with breathing. Unlike most animals which run with their mouths open thus compensating in part for the added exertion by increasing the oxygen intake, horses run with their mouths closed and teeth clenched which makes breathing more difficult. The exertion of heavy breathing and general nervous condition of the animal results in the tongue being forced or falling backwardly into the throat. To prevent this and to improve the breathing capacity it is common practice to tie a strand of cloth about the horse's tongue and then about his lower jaw so as to hold it forward in the mouth in its normal position. This however is extremely painful to the horse and while it does prevent the tongue from falling backwardly into the throat and obstructing breathing it aggravates the horse and is the cause of much of the ugliness and temper displayed by race horses. The device of the invention has particular use for replacing the rag or strand used heretofore as when placed about the lower jaw of the horse as shown in Fig. 8 it will hold the tongue securely in a forward position without constricting it and without constraining the tongue, that is preventing the tongue from moving normally within the mouth. The device has been used and found to be sufficiently comfortable to the horse so that it makes no objection to its presence for as long as an hour ahead of the race and has been found to improve the breathing capacity and increase the general

5

tone of the horse's behavior to such an extent that it has improved its speed in races.

While the device has particular use for horses it could of course be used for other animals, for example, during the performance of operations in the same manner as used in conjunction with humans.

An important aspect of the device whether used for humans or animals is that while it holds the tongue in place, that is in its normal position in the mouth it does not impair normal movement of the tongue within the mouth during such involuntary acts as swallowing, breathing, chewing and so forth so that it is not at all uncomfortable, does not agitate the person or animal and is not sufficiently constrictive in its action to check the normal flow of blood in the tongue.

The elastic construction of the device makes it possible to produce one size for substantially all purposes although it is to be understood that for animals of unusual size it would be within the scope of the invention to increase the proportions both as to the size of the loops and the diameter and strength of the strands of which the loops are made.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A device for supporting the tongue within the mouth at its normal position comprising a pair of flexible substantially circular members of different size, the smaller member normally lying within the larger member with its center located on a diameter of the larger member, between its center and its rim, and a normally straight element flexible in twist about its axis and in bending at right angles thereto, connected, along the diameter which is common to the centers of the two members, at one end to the rim of the larger member and at its other end to the rim of the smaller member.

6

2. A device according to claim 1, wherein the smaller member and the connecting element are of circular cross-section and comprised of rubber.

3. A device according to claim 1, wherein the circular members and their connecting element are of circular cross-section.

4. A device according to claim 1, wherein an auxiliary strand is attached at its ends to portions of the band externally of the mouth at the opposite sides of the chin and is adapted to extend rearwardly therefrom about the back of the neck to hold the device in place.

5. A device according to claim 1, wherein an auxiliary strand having hooks at its ends is attached by said hooks to portions of the band externally of the mouth at the opposite sides of the chin and is adapted to extend rearwardly therefrom about the neck to hold the device in place.

6. A device according to claim 1, wherein a strand of sufficient length to extend about the neck is integrally joined at its ends to said flexible band at substantially diametrically opposed points between the top and bottom thereof.

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