The invention relates to a composition of matter in the form of a salve adapted to be applied externally to the body in the treatment of ulcers, lesions, burns, fistulas and the like. The salve may be employed for either medical or veterinary purposes.

The principal initial ingredients preferably employed in the preparation of the salve are trioxymethylene or formal, camphor, naphthalene, benzoic acid and menthol. In addition to these ingredients zinc oxide is ordinarily employed as a filler, while solid or liquid vaseline, castor oil, lanolin, or other like fatty substances may be likewise employed, according to the particular therapeutic use for which the salve is to be employed. The zinc oxide and the fatty substances may be considered as of minor importance as compared with the other ingredients which enter into the composition.

In preparing the composition several important factors must be taken into consideration, bearing in mind that the salve is to be employed for the treatment of burns, ulcers, lesions and the like. First, the salve must possess germicidal characteristics; secondly, it must be capable of neutralizing the toxins liberated by the bacteria, thirdly, the ingredients of the salve should be such as to avoid irritation of the tissue so far as possible. Finally, the composition should have the physical characteristics which render it suitable and available for external application, so that the effective ingredients of the composition will perform their respective functions in the most efficient manner.

One of the important objects of the present invention is, therefore, to provide a salve for external application suitable for the treatment of burns, ulcers, fistulas and the like, which is stable in character, does not destroy or harm the tissues, and is an energetic bactericide. No single ingredient is known to me which possesses these characteristics, and I have accordingly combined known ingredients to produce a new composition of matter having the desired characteristics which differ from those of the component constituents. Certain of these constituents, as for example trioxymethylene and naphthalene, possess dangerous characteristics when used alone and others do not possess the necessary healing qualities.

The bactericidal qualities of trioxymethylene are well recognized. However, as stated above, its use alone is frequently irritating and even dangerous. Accordingly I provide a vehicle for the trioxymethylene in which the latter is suspended in the colloidal state. The composition which I employ as a vehicle possesses remedial characteristics in addition to its function as a carrier for the trioxymethylene or formal.

According to my invention four ingredients are employed in the preparation of the vehicle, namely camphor, naphthalene, benzoic acid and menthol. Of these ingredients the camphor and naphthalene react with each other to form a chemical compound having different remedial characteristics than the initial materials, while the benzoic acid and menthol likewise react to form the chemical compound, benzoate of menthyl. The reaction product of the camphor and naphthalene possesses bactericidal characteristics, and in addition serves as a vehicle for the trioxymethylene, while the benzoate of menthyl is a reversible compound which is found to avoid the putrescent phenomena through the intermittent action of the body due to its reversibility.

The preferred method of preparing the composition will now be described. In preparing the vehicle benzoic acid, menthol, camphor and naphthalene are employed. The benzoic acid is melted at a moderate temperature and then menthol is added in the proportion of about four parts by weight of benzoic acid to three parts by weight of menthol. These quantities are substantially molecular proportions of the benzoic acid and menthol respectively.

Next, eight parts by weight of natural camphor are added, although the melting point of camphor is 110° C., it is better to drop down the temperature to 150° C., because the benzoic acid acts as a molder. As soon as the camphor is melted, purified naphthalene is added in a proportion of about five parts by weight.

Reactions take place between the benzoic acid and menthol and between the camphor and naphthalene. An excess of camphor is preferably employed over the molecular quantity and such excess camphor acts as a solvent for the two reaction products.

To the vehicle produced as described, a quantity of trioxymethylene, or formal, is added, preferably in a proportion of five parts by weight of trioxymethylene or formal to one hundred parts by weight of the vehicle. The trioxymethylene is suspended in the colloidal state in the vehicle. It seems probable that a reaction takes place between some of the trioxymethylene and the excess camphor. If desired, zinc oxide may be added, in a proportion of about 210 parts by weight to 100 parts of the vehicle and 5 parts of trioxymethylene. The zinc oxide serves as a filler principally, but is a desirable constituent by reason of its known medical properties. Vaseline, castor oil, lanolin or other fatty substances may be employed in addition to the above mentioned ingredients in order to give the salve the proper consistency.

The reaction between the menthol and benzoic
Acid produces the ester, benzoate of menthyl, according to the following reaction:

\[
\text{CH}_3\text{-CH} = \text{CH}-\text{OH} + \text{CH}_3\text{-O} = \text{CH}-\text{CH} = \text{CH} - \text{CH} \rightarrow \text{CH}_3\text{-O} \cdot \text{C} \cdot \text{CH} = \text{CH} - \text{CH} = \text{CH} - \text{OH}
\]

The reaction between the camphor and naphthalene is as follows:

\[
2\text{C}_6\text{H}_5\text{H}_3\text{O} + 2\text{H}_2\text{O} \rightarrow (\text{C}_6\text{H}_5\text{H}_3\text{O})_2 + 2\text{H}_2\text{O}
\]

The product of the reaction of the camphor and naphthalene may be used alone as a vehicle for the trioxymethylene or formal, but the medicinal properties of such a composition are not so effective as a vehicle comprising both the reaction products of menthol and benzoic acid and of camphor and naphthalene are employed in conjunction with the trioxymethylene in colloidal suspension.

Utilization of the bactericidal and antiseptic qualities of the trioxymethylene or formal constitutes an important factor in the improved composition, because when combined with the vehicle a stable composition is formed, with a considerable increase in the antiseptic properties. Moreover, the diffusing and impregnating qualities of the composition are much superior to those of the initial ingredients. Zinc oxide readily combines with the composition of matter, and while improving the physical characteristics of the composition as a whole, it also improves the remedial qualities of the composition.

This preparation may be readily made up in various strengths diluted with various oily or fatty mediums, such as vaseline, castor oil, lanolin, or the like, in which it may remain indefinitely while retaining its medicinal qualities. The medicament is intended for external use, and since it is a synergistic antiseptic, not toxic, and not destructive of tissues, it may be employed in the treatment of all kinds of lesions caused or complicated by the presence of germs, particularly pyogenic micro-organisms.

The medicament acts as a stimulant of cellular repairing in all cases of loss of substance, pathological as well as surgical origin, this effect being particularly noticeable in the case of lesions which are slow to heal.

The innocuity of the antiseptic not only when in contact with the skin, but also when used on subcutaneous tissue, muscles, bones, pleura, peritoneum and all epitheliums investing most of the natural cavities makes the substance valuable in the toxi-infectious lesions of organic structures referred to above.

The medicament may be used in the customary manner known to the surgical practice; it is directly applied in the case of burns, ulcers, fistulas and the like. In the case of canalization, gauzes, tubes or dressings are impregnated with the medicament and applied according to the requirements of the case. In deep inaccessible lesions the medicament is dissolved in liquid vaseline and conducted to the lesion through catheters, or under pressure through suitable syringes.

The strength of the medicament employed is determined by the character of the wound, or diseased tissue, and by its location, as will be readily apparent to those skilled in the art.

What I claim is:

1. A medical composition adapted for external application which includes as an important ingredient thereof a reaction product of naphthalene and camphor.

2. A medical composition adapted for external application which includes as an important ingredient thereof a reaction product of menthol and benzoic acid.

3. A medical composition adapted for external application which includes as an important ingredient the reaction products of (1) menthol and benzoic acid and (2) naphthalene and camphor.

4. A stable medical composition adapted for external application which includes as an important ingredient trioxymethylene colloidal suspension in a vehicle comprising (1) a reaction product of benzoic acid and menthol and (2) a reaction product of camphor and naphthalene.

5. A stable medical composition adapted for external application which includes as an important ingredient trioxymethylene colloidal suspension in a vehicle comprising (1) a reaction product of benzoic acid and menthol and (2) a reaction product of camphor and naphthalene.

6. A process of producing a stable medical composition which comprises mixing melted benzoic acid and menthol, then adding camphor and naphthalene, heating until a reaction takes place between the benzoic acid and menthol and between the camphor and naphthalene, and then adding trioxymethylene or formal and mixing to obtain a reaction product of trioxymethylene in a vehicle comprising the reaction products of the menthol and benzoic acid and of the camphor and naphthalene.

7. A medical composition as set forth in claim 1, together with a solvent for the reaction product consisting of uncombined camphor.

8. A medical composition as set forth in claim 2, together with a solvent for the reaction product consisting of camphor.

9. A medical composition as set forth in claim 3, together with a solvent for the reaction products consisting of uncombined camphor.

10. A process of producing a vehicle for trioxymethylene, having medicinal properties, which comprises mixing melted benzoic acid and menthol in substantially molecular proportions, then adding camphor and naphthalene, the camphor being employed in excess of the molecular proportions, and heating until a reaction takes place between the benzoic acid and menthol and between the camphor and naphthalene, the excess camphor serving as a solvent for the reaction products.

ANGEL ZIMBRON, Jr. [L.s.]