G. GILLMAN
BLOOD EXTRACTING DEVICE
Filed Aug. 21, 1922

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Inventor
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By: Attorney
To all whom it may concern:

Be it known that I, GEORGE GILLMAN, a citizen of the United States, residing in the city and county of San Francisco, and State of California, have invented a new and useful Improvement in a Blood-Extracting Device, of which the following is a specification.

My invention relates to improvements in devices for the extraction of blood from the human body for testing purposes.

The primary object of my invention is to provide an improved blood extracting device.

Another object is to provide an improved device wherein the difference between blood pressure and atmospheric pressure is utilized for extracting blood without the use of a vacuum.

A still further object is to provide an improved device wherein a hypodermic needle is arranged to deliver blood directly from the body into a receptacle through a stopper arranged to seal the extracted blood within the receptacle.

Another object is to provide an improved device of the character disclosed wherein a hypodermic needle is inserted through a penetrable stopper fitted to a receptacle and arranged to contract to close the hole made therethrough by the needle when said needle is withdrawn after the extraction of a sample of blood, to facilitate the taking and retaining said sample.

A still further object is to provide a device of simplified construction affording economy of production and use and which may be simply and effectively operated.

I accomplish these and other objects by means of the device disclosed in the drawings forming a part of the present specification wherein like characters of reference are used throughout said specification and drawings to designate similar parts, and in which:

Fig. 1 is an enlarged side elevation partly in section of my improved blood extracting device.

Fig. 2 is a side elevation of my improved needle drawn upon a still larger scale and shows at right angles to the position shown in Fig. 1, the stopper and receptacle being shown in section.

Fig. 3 is a horizontal section taken upon the line 3-3 of Fig. 2 in the direction indicated.

Fig. 4 is a broken side elevation of the lower portion of a needle of slightly modified construction wherein the openings are disposed upon the sides rather than in the ends of the points.

Referring to the drawings the numeral 1 is used to designate in general a receptacle of suitable size preferably made of transparent glass. The receptacle 1 is open at 65 one end, said open end being fitted with a stopper 2 preferably made of rubber or other penetrable material of a similar nature for a purpose hereinafter more fully described.

A hypodermic needle 3 having an outer 70 point 4 and an inner point 6 is provided with a gripping portion 7 and annular flange 8 intermediate said ends. The outer point 4 is of the usual beveled shape adapted for insertion into a body in the well known manner. The inner end 6 is of a similar shape and is adapted to be inserted through the stopper 2, the flange 8 affording a surface against which pressure may be applied by the fingers of an operator to force the inner end of the needle through the stopper to obtain the desired positioning of the needle with respect to the stopper.

A second needle member 9 is arranged to be inserted through the stopper into in-wardly extending position, said needle member having a passage 11 therethrough to form a vent for maintaining atmospheric pressure within the receptacle 1. In my preferred construction the point 9 is per- 90 manently secured in close parallel relation with the inwardly extending portion of the needle 3, the inner end of the point 9 being beveled at right angles to the point 6 and disposed slightly nearer the stopper 2 so that when inserted the extreme point will enter the hole made by the point 6 and expand the stopper to receive the needle member. The other end of the member 9 ex- 95 tends outwardly through the flange 8 and is permanently secured to said flange and the enlarged gripping portion 7 in any suitable manner such as to permit the passage 11 to be open to the atmosphere as best shown in Fig. 3 of the drawings.

A thoroughly sterilized needle is mounted upon a stopper 2 by forcing the points 6 and 9 therethrough in the manner above de-
scribed and the stopper then fitted into the open end of a receptacle 1 as shown in Fig. 1, the needle being maintained sterile by fitting a cap 12 over the outer end of the needle to engage the outer portion of the stopper. When it is desired to extract a sample of blood from a patient, the cap 12 is removed and the sterilized outer point 4 inserted into the body of the patient to tap any desired vein or artery as in using the ordinary hypodermic needle. It will be noted that the member 9 forms a vent from the receptacle to the atmosphere so that atmospheric pressure will be maintained within the receptacle. The blood pressure of the body being greater than atmospheric pressure, the difference in pressure will cause blood to be forced through the needle into the receptacle. When the desired amount of blood has flowed into the receptacle the needle is withdrawn from the body and the inwardly extending portion of the needle and the member 9 withdrawn from the stopper 2. The withdrawal of the needle portions from the stopper permits the stopper to contract and close the hole made therethrough, thus sealing the sample within the receptacle, the stopper being made of rubber or the other similar material adapted to accomplish the self-closing of the hole. Rubber is particularly adapted for making the stopper 2 as the insertion of the point 6 and needle portion 5 therethrough serves to cut through and spread apart the material without actually severing and displacing any portion of the stopper. After removal of the needle from the stopper it is sterilized and applied upon other stoppers and receptacles for the taking of further blood samples.

In Fig. 4 I have shown the construction of the inner needle end 6 and the member 9 preferable for use in connection with stoppers made from cork or other similar material from which portions are likely to be cut or broken away by the insertion of the needle therethrough. In this construction it will be noted that openings 14 and 15 are made in the sides of the needles rather than through the beveled pointed ends. By this construction particles of material are not cut out by the points and the likelihood of blocking either passage in this manner is effectively overcome.

From the above description it will be seen that I have provided an improved device by the use of which it is possible to dispense with the costly and inconvenient vacuum tube receptacles commonly employed in devices now commonly used for extracting blood samples. While I have disclosed what I now deem to be the preferred embodiment of my invention, I do not desire to restrict myself to the precise disclosure made but wish to avail myself of all such modifications in structure and arrangement as may fall within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A blood extracting device comprising a receptacle; a penetrable stopper fitted to said receptacle; a hypodermic needle having an inner pointed end adapted to be movably inserted through the stopper to communicate with the interior of the receptacle, said stopper being adapted to contract and close the hole made by said pointed end to seal the receptacle when the needle is removed; an annular flange upon the needle to limit the movement of the needle through the stopper; and a member mounted adjacent the inner pointed end of the needle and extending through the flange, said member being adapted for insertion through the stopper with said inner pointed end and having an opening therethrough to form a vent to the atmosphere whereby blood pressure within a body will operate to force blood through the hypodermic needle into the receptacle when the outer end of the needle is inserted into said body.

2. A blood extracting device comprising a receptacle; a penetrable stopper fitted to said receptacle; a hypodermic needle the outer end of which is arranged to be inserted into a body; a pointed inner extension formed upon the needle and arranged to be removably inserted through the stopper to communicate with the interior of the receptacle, said stopper being adapted to contact and close the hole made by the inner pointed end to seal the receptacle when the needle is removed; a second inwardly extending point connected with the needle and arranged to be inserted through the stopper with the inner end of the needle, said second point having an opening therethrough to form a vent for maintaining atmospheric pressure within the receptacle whereby blood pressure within the body will operate to force blood through the needle into the receptacle when the outer end of said needle is inserted into said body.

3. A blood extracting device comprising a receptacle; a stopper fitted to the receptacle; a hypodermic needle having inner and outer ends the inner end being adapted for insertion through the stopper; a flange secured upon the shaft of the needle between said ends to limit the movement of the inner needle end through the stopper; a second inner point mounted adjacent the inner needle point and extending outwardly through the flange, said second point being arranged to be inserted through the stopper together with said inner needle point and having an opening therethrough forming a vent to maintain atmospheric pressure with.
in the receptacle whereby blood pressure within a body will operate to force blood through the hypodermic needle into the receptacle when the outer end of the needle is inserted into said body.

4. A blood extracting device comprising a receptacle; a stopper fitted to the receptacle; a hypodermic needle having inner and outer ends, the inner end being adapted for insertion through the stopper; a flange secured upon the shaft of the needle between said ends to limit the movement of the inner needle end through the stopper; a second inner point mounted adjacent the flange, said second point being arranged to be inserted through the stopper together with said inner needle point and having an opening therethrough forming a vent to maintain atmospheric pressure within the receptacle whereby blood pressure within a body will operate to force blood through the hypodermic needle into the receptacle when the outer end of the needle is inserted into said body; and a cap arranged to removably enclose the outer end of the needle to normally maintain the same in a sterilized condition preliminary to usage.

In witness whereof I hereunto set my signature.

GEORGE GILLMAN.