

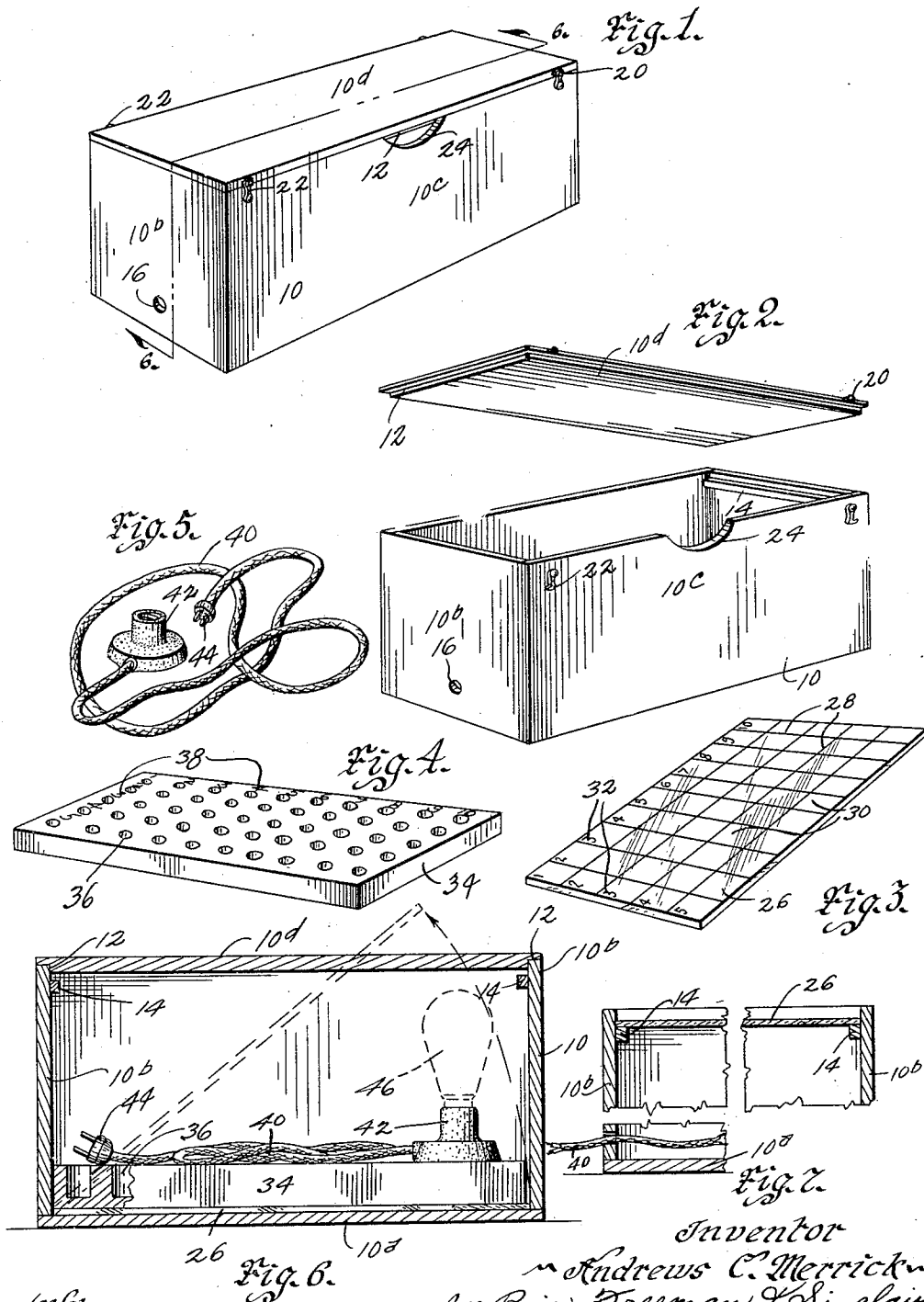
Jan. 5, 1932.

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1,839,573

APPARATUS FOR TESTING BLOOD

Filed Oct. 15, 1928



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APPARATUS FOR TESTING BLOOD

Application filed October 15, 1928. Serial No. 312,587.

The object of my invention is to provide a method and apparatus for testing the blood of the poultry and other animals or beings for discovering the existence or non-existence of certain disease conditions in the blood.

More particularly, it is my object to provide a method of relatively simple and brief of technique, whereby tests may be quickly, conveniently and accurately made.

It is also my purpose to provide a simple and inexpensive and convenient apparatus for making such tests.

In this connection, it is my purpose to provide an apparatus including a case-like element having a quickly removable glass cover plate whereon the serum taken from the animals or being tested may be conveniently placed for dropping thereon a small portion of diagnostic agent for determining whether or not a certain reaction will take place, which reaction is to be anticipated if the serum contains certain agglutinins of harmful bacteria carried by the body of the animal, from which the blood for test has been taken.

A further object is to provide in the apparatus itself the case, the transparent member, and means for illuminating the transparent member from below and also for heating it, so that the reaction may be properly observed microscopically, and so that the serum placed on the plate or glass may be rapidly agglutinated by reason of heat as soon as the diagnostic agent is placed on the serum.

With these and other objects in view, my invention consists in the construction and arrangement of the parts of the apparatus hereinafter explained and in the practice of the method as herein more fully set forth.

In the drawings herewith illustrating the apparatus used,

Figure 1 shows a perspective view of the case comprising a part of the apparatus.

Figure 2 is a perspective view showing the cover removed.

Figure 3 is a perspective view of the transparent glass plate illustrating the shape and size thereof and the arrangement of indicating marks for dividing the plate into sections or squares.

Figure 4 is a perspective view of a plate having a series of recesses or holes for receiving and holding test tubes.

Figure 5 is a perspective view of the lamp socket and cord and plug forming a part of the apparatus.

Figure 6 is a vertical, sectional view through the case showing the glass plate and the test tube holding plate and lamp cord and socket therein; and

Figure 7 is a transverse, sectional view showing the case with the glass plate installed in position for use, parts being broken away.

I shall first describe the apparatus and then explain the use thereof and the method which may be employed either with this or other apparatus.

In the drawings herewith, I have used the reference numeral 10 to indicate generally a case rectangular in outline and longer than it is wide or deep. The case consists of the bottom 10a, the end walls 10b, the side walls 10c and the top or cover member 10d.

The top or cover member has on its under surface adjacent to its edge a rabbet 12, extending entirely around it, so as to permit the top to be partially inset into the casing, as shown for instance in Figure 6.

On the inner sides of the ends 10b spaced slightly from the upper edges thereof are fixed cleats 14. In one end 10b of the casing is a hole 16 through which an electric current conducting cord may be inserted.

The top 10d may be locked to the casing proper by means of small head pins or the like and pivoted hooks 22.

In the upper edge of one side wall 10c of the casing 10 is a recess or cut-out portion 24, through which the fingers may be inserted for removing the top or the glass plate now to be described.

I provide a rectangular transparent glass plate 26, which is adapted to rest upon the cleats 14 and thus fit snugly in the top of the box or case.

The upper surface of the plate 26 is preferably divided by suitable indicating lines 28 into squares 30. The squares may be further identified by indicating characters 32.

In connection with and as a part of the ap-

paratus, I preferably use a plate 34 of such size as to snugly fit in the casing 10 having a plurality of regularly arranged recesses 36 in its upper part adapted to receive the lower ends of test tubes. The plate 34 may be provided with suitable indicating characters 38 for identifying the respective holes 36. The holes 36 are preferably arranged in rows, so as to be aligned both ways of the plate.

The apparatus includes also an ordinary lamp cord or the like 40 having at one end the bulb socket 42 and at the other end an ordinary plug 44.

In practicing my method with this particular apparatus, the serum or blood taken from the animal or being to be tested is placed in a test tube and the test tube is placed in the plate 34, which has theretofore been put on a table or the like. It will, of course, be understood that a number of tests may be conveniently made in prompt succession if several of said test tubes are carried by the plate 34.

The blood if taken from a fowl may be drawn from the wing vein or if taken from the cattle may be drawn from the jugular or mammary vein.

The blood is permitted to remain in the test tube for about ten hours for thus permitting it to clot and causing the separation of the solid matter from the liquid portion, so that the serum may then be removed for the purpose of making the diagnostic test.

In making tests of poultry for instance, the test tubes marked "fowls" may be placed in the particular holes 36 and a record kept showing what particular fowl is represented by the serum in the particular tube. The poultry, of course, may be marked with leg bands or the like for convenience in keeping records of the tested birds.

A bulb 46 is placed in the socket 42 and the plug 44 is connected with any suitable socket so that current can be had for lighting the lamp. The lamp is placed in the casing and the glass plate 26 is placed in position as shown in Figure 3, resting upon the cleats 14.

When the tests are to be made, the serum from the different test tubes is removed from each tube by a pipette and dropped upon the glass plate, preferably on the square 30 corresponding to the hole 36 in the plate 34 receiving the test tube from which the serum was drawn.

Thus a number of tests may be made in a series of operations and proper record can be kept of the tests.

As soon as the drop of serum is placed upon one of the squares 30, there is placed on top of such drop a small amount of diagnostic agent.

When the light bulb is illuminated, it will generate some heat and this will warm the plate 30 and speed up the agglutination and

thus facilitate the promptness of the reaction.

The expert can determine immediately whether the reaction occurs. If the animal is not a carrier of the suspected disease, the diagnostic agent will not affect the serum and such a test is then referred to as "negative".

Where the disease is present, the diagnostic agent coacts with the serum for producing a curdling appearance, which is readily visible and which indicates that the animal whose blood is being tested is a carrier of the suspected disease, such for instance as bacillary white diarrhea in poultry or abortion disease in cattle.

The diagnostic agent which I prefer to use is one having a high proportion for instance of sodium chloride. As an illustration of such a diagnostic agent used in connection with *Salmonella pullorum* and/or *Bacterium sanguinarum* as a culture, I may use the following:

14% sodium chloride (NaCl).
 .002% sodium hydroxide (n/1).
 .005% lithium bromide (LiBr).
 .5% phenol (C₆H₅OH).
 86.493% distilled water (H₂O).

I then prefer to use a diagnostic agent having a high bacterial content and I find that I can then employ my method and apparatus without a microscope, because the agglutination can be readily observed with the naked eye. This is of considerable importance because it facilitates the rapidity with which tests can be made for a large number of animals and eliminates the necessity for using and carrying from place to place an expensive microscope.

I claim as my invention:

1. An apparatus for testing blood from beings comprising a casing having an open top, a glass plate having indicating means for dividing the plate into sections and means for supporting the plate adjacent the top of said casing and a cover for said casing adapted to immediately overlie said glass plate.

2. An apparatus for testing blood from beings comprising a casing having an open top and having cross members at its ends only, a glass plate adapted to rest on said cross members or to be placed in said casing therebelow, said casing having therein means for illuminating the glass plate from below.

3. An apparatus for testing blood from beings comprising a casing having an open top and having at its ends only, cross members, a glass plate adapted to rest on said cross members having indicating means for dividing the plate into sections, said casing having means for illuminating and heating the glass plate from below.

4. An apparatus for testing blood from beings comprising a casing having an open top and having at its ends cross members, a

glass plate adapted to rest on said cross members having indicating means for dividing the plate into regular sections, and a plate or rack having a plurality of recesses corresponding in arrangement to the sections of the glass plate and adapted to receive containers.

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15 5. An apparatus for testing blood from beings comprising a casing having an open top and having at its ends only, cross members, a glass plate adapted to rest on said cross members, the glass plate being adapted to fit within the casing by tilting it and inserting it with a swinging motion below the cross members.

20 6. In an apparatus of the class described, an open top casing, a lid therefor, a transparent plate and means carried by the casing for supporting the plate immediately below the lid whereby the lid, when in position on the casing will prevent the dislocation of said transparent plate from its supported position in the casing.

25 Des Moines, Iowa, September 26, 1928.
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