To all whom it may concern:  

Be it known that I, Edwin P. Baum, a citizen of the United States, residing at Keokuk, in the county of Lee and State of Iowa, have invented certain new and useful Improvements in Oil-Purifying Apparatus, of which the following is a specification.

My invention relates to improvements in apparatus for purifying oil by removing the water contained therein.

An important object of my invention is to provide apparatus of the above mentioned character, which is simple in construction, inexpensive to manufacture, and will operate expeditiously and continuously.

Other objects and advantages of this invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, the figure is a central longitudinal section through the entire apparatus.

In the drawings, wherein is illustrated a preferred embodiment of my invention, the numeral 1 designates a preferably cylindrical vertical main shell or casing, having its lower end permanently closed and its upper end normally closed by a removable lid or cover 2, equipped with handles 3. The lid or cover 2 is provided centrally thereof with an opening 4, through which passes a vertical feed pipe 5, the lower end of which passes through a double walled conical heating chamber 6, and is rigidly detachably connected therewith by means of rings 7 and 8 disposed above and below the same. Attention is called to the fact that the feed pipe 5 discharges into the upper end of the heating chamber 9 formed by the double walled shell 6 and has no communication with the dead air space 10 occurring between the walls of said double walled shell. The conical double walled shell 6 increases in diameter downwardly and has its lower edge completely closed by a ring 11, carrying an upwardly extending annular flange 12, forming an annular catchment receptacle or trough 13. The double walled heating chamber or shell 6 is supported by a suitable number of tubular legs 14, apertured near their lower ends, as shown at 15. The lower ends of these legs engage the bottom of the main shell or casing 1 while the upper ends thereof pass through apertures 16 formed through the walls of the double walled conical shell 6, with their upper ends in free communication with the annular catchment receptacle or trough 13. The upper ends of the tubular legs 14 are preferably slightly flared or spread, while clamping rings 17 are carried by these tubular legs and engage the lower wall of the shell 6, whereby the legs are rigidly connected therewith. The tubular legs 14 have no communication with the dead air space 10 of the double walled shell 6, such shell being hermetically sealed.

The numeral 18 designates a conical steam heating coil, which increases in diameter downwardly, and is arranged within the conical heating chamber 9, in spaced relation to the lower wall of the shell 6, as shown. Steam is supplied into the lower end of the coil 18 through a pipe 19 and passes out of the same through a pipe 20. The opening of the upper-most turn of the coil 18 is arranged below, spaced from, and in alignment with the discharge end of the feed pipe 5, whereby oil passing from this pipe will circulate inwardly of, through, and about the heating coil 18, in direct contact therewith upon first entering the heating chamber.

The numeral 21 designates a supply receptacle or hopper, having its upper end normally closed by a removable lid or cover 22, equipped with handles 23. This lid or cover is provided with a feed opening 24. The supply receptacle or hopper 21 has its bottom 25 formed conical, decreasing in diameter downwardly and provided at its reduced end with a tip or pipe section 26, extending into the upper end of the feed pipe 5, and preferably having screw-threaded engagement therewith, as shown at 27. Arranged within the supply receptacle or hopper 21 is a conical strainer 28, increasing in diameter downwardly, and having its enlarged end or base arranged upon the bottom 25 of the receptacle or hopper 21, as shown.

The numeral 29 designates an oil outlet pipe, connected with the main shell or casing 1, near and spaced from the upper end thereof, as shown. This oil outlet pipe communicates with an interior oil outlet hopper 30, having its upper enlarged end 31 formed entirely open, as shown. Arranged preferably diametrically opposite the oil outlet pipe 29 is a water outlet pipe 32, the inner end of which is in communication with a closed casing or box 33, arranged...
near the lid or cover 2, as shown. Extending into this casing or box 33 is a vertical water outlet pipe 34, held in place by brackets 35. The lower end of the pipe 34 is provided with a flaring in-take mouth 36, disposed near and spaced from the bottom of the main shell or casing 1, as shown.

The numeral 37 designates a vertical tube gage, connected with the main shell or casing 1, in the usual manner, to indicate the level of the liquid therein. The main shell or casing 1 is provided adjacent its bottom with a drain pipe 38, which is equipped with a suitable cut-off valve (not shown).

The operation of the apparatus is as follows: The oil having the water mixed therewith is fed into the receptacle or hopper 21, and passes through the conical strainer 28, whereby any soiled material of considerable size is prevented from passing into the main shell or casing 1. This oil now passes into the feed pipe 5, and gravitates through the same to be discharged from the lower end thereof, into the heating chamber 9. In this heating chamber the oil containing the water passes through, about, and in direct contact with the heating coil 18, whereby the oil is heated to a temperature at which it will separate from the water. The water condenses and moves to the bottom of the main shell or casing 1, while the oil circulates around the free edges of the double walled shell 6 and passes into the upper portion of the main shell or casing. The heated oil in the upper portion of the main shell or casing tends to circulate therein, passing upwardly adjacent the shell 1 and downwardly adjacent the double walled shell 6, as indicated by the arrows, while the entire body of the purified oil is rising. The function of providing the double walled heating chamber or shell 6 with the dead air space is to provide means for retaining the heat, as far as possible, within the heating chamber 9, wherein it is desired to heat the oil while the same is in the lower portion of the main shell or casing, to separate the same from the water. However, it has been found that all of the water may not be separated from the oil while in the heating chamber 9, the remainder of the water being separated from the heated oil after the same passes into the upper portion of the main shell or casing 1, adjacent the double walled shell 6, as above explained. When the oil separates from the water, above and adjacent the double walled shell 6, such water is collected in the catchment receptacle or trough 13, and passes downwardly through the tubular legs 14, to be discharged through apertures 15 onto the bottom of the main shell or cas-

ing 1. When the level of the oil and water in the main shell or casing 1 reaches a certain height, the oil passes into the hopper 30 and is discharged through the pipe 29, while the water passes from the bottom of the main shell or casing 1, through pipe 34, closed boxes or casing 35, and through pipe 32. Any sediment collecting in the bottom of the main shell or casing may be removed through the opening 38.

A particular advantage gained in my construction is the ease with which the several parts of the apparatus may be separated and assembled, for the purpose of cleaning or repair. It is obvious that the supply receptacle or hopper 21 may be readily disconnected from the feed pipe 5, whereby the lid or cover 2 may be removed, and the double walled shell 6 and associated elements taken out of the main shell or casing 1. It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:—

1. In apparatus of the character described, the combination with a main casing, of a shell arranged therein for forming a heating chamber therebelow and provided with an upstanding flange forming a catchment receptacle for the water separated from the oil, depending tubes connected with the shell and having communication with the catchment receptacle, a heating coil arranged within the heating chamber, and a feed pipe discharging into the heating chamber.

2. In apparatus of the character described, the combination with a main casing, of a conical double walled shell arranged therein and increasing in diameter downwardly for providing a heating chamber open at its lower end, a continuous flange formed upon the upper side of the conical shell for providing a catchment receptacle, tubular legs connected with the double walled shell, engaging the bottom of the main casing, and apertured near their lower ends, a feed pipe leading into the heating chamber, and a heating coil arranged within the heating chamber.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN P. BAUM.

Witnesses:

JNO. A. WLENER,
WM. J. DAWSON.