

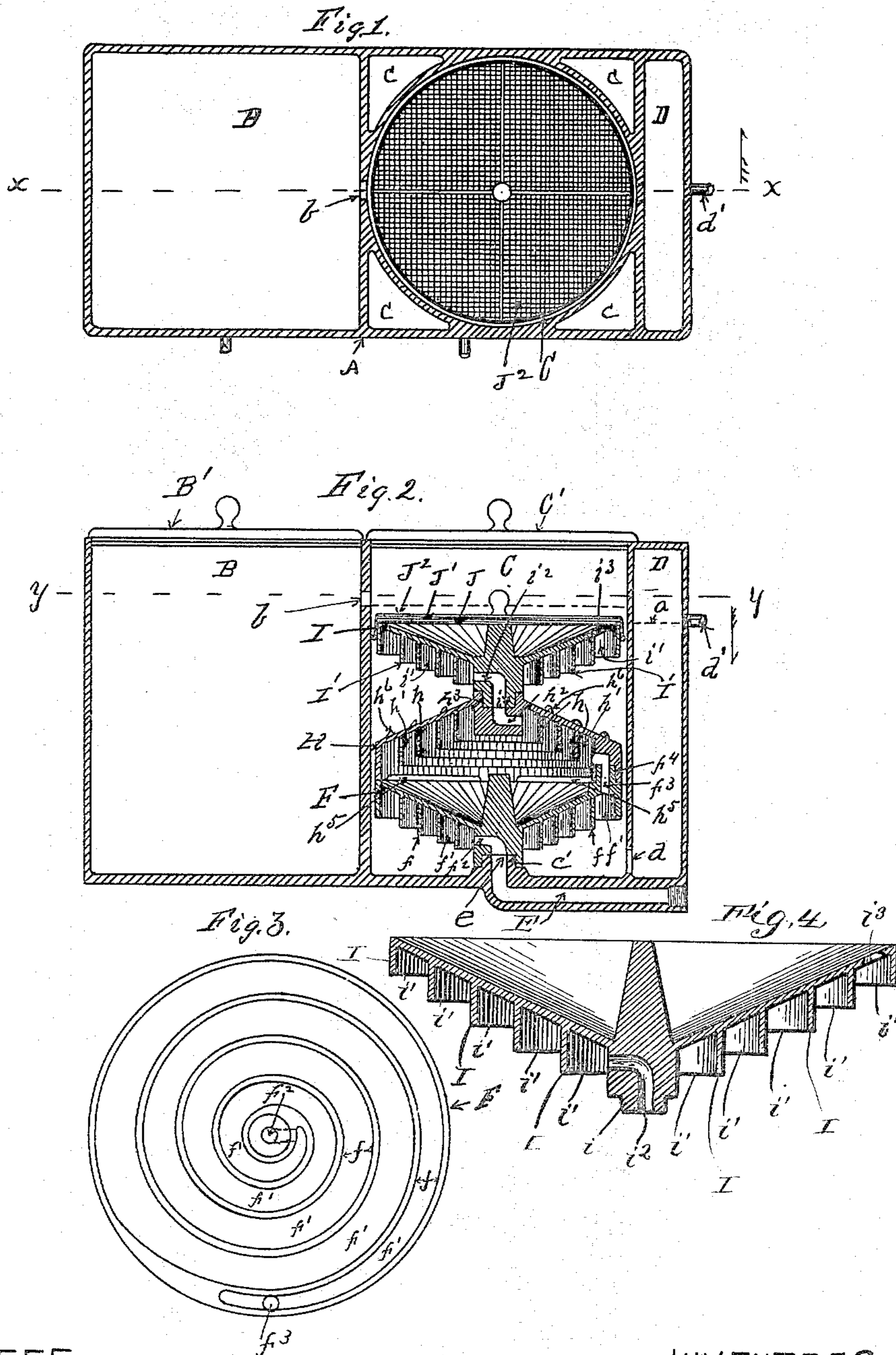
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Patented Jan. 2, 1900.

LE GRAND SKINNER & J. C. GLENN.
OIL AND WATER SEPARATOR AND PURIFIER.

(Application filed Mar. 28, 1899.)

(No Model.)



WITNESSES

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LE GRAND SKINNER AND JOHN C. GLENN, OF ERIE, PENNSYLVANIA; SAID
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OIL AND WATER SEPARATOR AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 640,494, dated January 2, 1900.

Application filed March 28, 1899. Serial No. 710,760. (No model.)

To all whom it may concern:

Be it known that we, LE GRAND SKINNER and JOHN C. GLENN, citizens of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Oil and Water Separators and Purifiers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such

as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification. Our invention relates to improvements in oil and water separators and purifiers; and it consists substantially in mechanism for receiving oil and water from the journals of steam-engines and other machinery and relieving the oil from grit and other impurities during its passage through the mechanism and finally separating the oil from the water and delivering the oil so separated and purified into a separate compartment or suitable receptacle in condition to be again used. This mechanism and the mode of its operation are hereinafter described and claimed in this specification and illustrated in the accompanying drawings, in which—

Figure 1 is a horizontal section of this improved oil and water separator and purifier on the line *y y* in Fig. 2 looking in the direction of the arrow. Fig. 2 is a vertical central section of the same on the line *x x* in Fig. 1 looking in the direction of the arrow. Fig. 3 is a view of the under side of one of the cones forming part of our invention. Fig. 4 is a vertical section of the cone I detached from the other mechanism.

In the drawings thus illustrating this invention, A is a case having three chambers B, C, and D therein. This case A we preferably make of a single casting, and the compartment C is made circular; but, if desirable, one of the corner-spaces *c* can be utilized therefor in lieu of the compartment D, which would be thereby dispensed with, these features of shape not being material in the construction of the invention.

In the bottom of the chamber C there is an inlet-passage E, opening upward into the cen-

ter of the bottom of the chamber C through a nipple *c'*. Upon the nipple *c'* is placed an inverted cone F, provided on its under face with a spiral rib *f*, which forms a spiral passage *f'*, 55 connecting at the center of the cone with an opening *f*², which connects with the opening *e* in the top of the nipple *c'* and at its outer end with a vertical passage *f*³ through a nipple *f*⁴ on the upper surface of the cone F, as 60 illustrated in Figs. 2 and 3. Upon the top of the inverted cone F is placed a cone H, provided on its under surface with a continuous spiral rib *h*, which forms a spiral passage *h'* on its under surface, connecting at its outer 65 end with the passage *f*³ in the nipple *f*⁴ and terminating at its inner end in a passage *h*² in the center of socket *h*³ at the apex of the cone H. There are also recesses *h*⁵ in the lower edge of the periphery of the cone H to 70 permit the free passage of liquids between said cones, and on the top of the cone H there are ribs *h*⁶ to catch sediment falling from above. In the socket *h*³ is placed a projection *i*, extending downward from the center 75 of an inverted cone I, which cone I has on its undersurface a continuous spiral rib *i'*, which forms a continuous passage *i'* from the central part of the under face of the inverted cone I, where this passage communicates 80 through a passage *i*² with the passage *h*² and extends therefrom to an opening *i*³ near the periphery of the disk I, as illustrated in Fig. 3, so that there is a continuous passage from the inlet E to the outlet-opening *i*³ in the inverted cone I. Upon the top of the inverted 85 cone I are placed screens J J' J², through which the fluid coming up through the opening *i*³ passes. Above the screen J² there is an opening *b* through the wall separating the chambers C and B, and at the bottom of the wall 90 dividing the chambers C and D there is an opening *d*, and through the outside wall of the chamber D there is an outlet-opening *d'* on a lower horizontal plane than the opening *b*, 95 and on the tops of the chambers B and C are removable covers B' and C' for obtaining access to said chambers.

The operation of the mechanism hereinbefore described depends upon the difference of 100 the gravity of oil and water and is as follows: The chambers C and D being first filled with

water to the line α , the oil to be treated, together with such water and other impurities as may be intermixed therewith, are then delivered to the machine through the passage
 5 E, from which they pass up through the nipple c' and into the inner end of the spiral passage f' in the inverted cone F, and the oil being lighter than the water in which the cone is immersed causes the oil to adhere to
 10 the upper surface of said passage and travel upward in said spiral passage until it finally escapes through the passage f^3 into the outer end of the spiral passage h' on the under face of the cone H, through which it in like man-
 15 ner travels until it passes out and up through the passages $h^2 i^2$ into the inner end of the passage i on the lower face of the inverted cone I, when it continues to travel onward until it finally makes its exit through the
 20 opening i^3 in the outer end of said spiral passage i' , from whence it passes up under the screens J J' J² and up through said screens and out through the opening b into the storage-receptacle B, while the water being intro-
 25 duced therewith through the passage E meanwhile passing out through the opening d into the chamber D and, finally, escaping at the opening d' while the oil is traveling upward through the spiral passages. Its con-
 30 stant contact with the water in which the cones F, H, and I are submerged operates to wash it and separate dirt of all kinds therefrom, which fall down therefrom by gravity through the open bottoms of said spiral pas-
 35 sages, so that after passing through the screens J J' J² only the comparatively pure oil remains floating upon the top of the water above the line α , and as it accumulates it passes off into the compartment B in condi-
 40 tion to be again used, and when at any time the water in the compartment C becomes fouled or sediment deposited from the oil accumulates the cover C' can be removed and the screens J J' J² and the cones I, H, and F
 45 removed and cleaned and the chamber C also cleaned, and the parts can be again replaced and put in operation.

Having thus described this invention so as to enable others to construct and use the
 50 same, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination in an oil and water separator and purifier, of a receptacle having two

chambers communicating near the bottom 55 thereof and having outlets on a different horizontal plane, and an inlet in the bottom of one of said chambers, with a series of cones, one above the other, having spiral passages on the lower faces thereof communicating 60 with the inlet in said chamber and with each other, substantially as and for the purpose set forth.

2. The combination in an oil and water separator and purifier, of a series of cones, one 65 above the other, having spiral passages in the lower faces thereof communicating with an inlet at the bottom of the oil and water separator and purifier, and with each other, so as to form a continuous passage, substantially 70 as and for the purpose set forth.

3. In an oil and water separator and purifier, the combination of an inverted cone having a spiral passage on its lower face communicat- 75 ing with an inlet at its center and extending to an outlet near its periphery with a cone mounted thereon having a spiral passage on its lower face communicating with the outlet of the passage in said inverted cone and ex- 80 tending to an outlet at the apex of said cone, substantially as and for the purpose set forth.

4. The combination in an oil and water separator and purifier, of a receptacle A having a chamber B, a chamber D having an outlet d' and a chamber C having an inlet E and out- 85 let b into the chamber B and an outlet d in the chamber D, an inverted cone F in said chamber C having a spiral passage f' on its lower face communicating with said inlet, a cone H mounted on the cone F and having a 90 spiral passage h' on its lower face communicating at its outer end with the spiral passage f' , an inverted cone I mounted on the cone H and having a spiral passage i' on its lower face, the inner end of which communicates 95 with the inner end of the spiral passage h' , and its outer end with an opening up through the shell of the cone, and screens J J' J² mounted on the top of said inverted cone I, substantially as and for the purpose set forth. 100

In testimony whereof we affix our signatures in presence of two witnesses.

LE GRAND SKINNER.
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Witnesses:

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