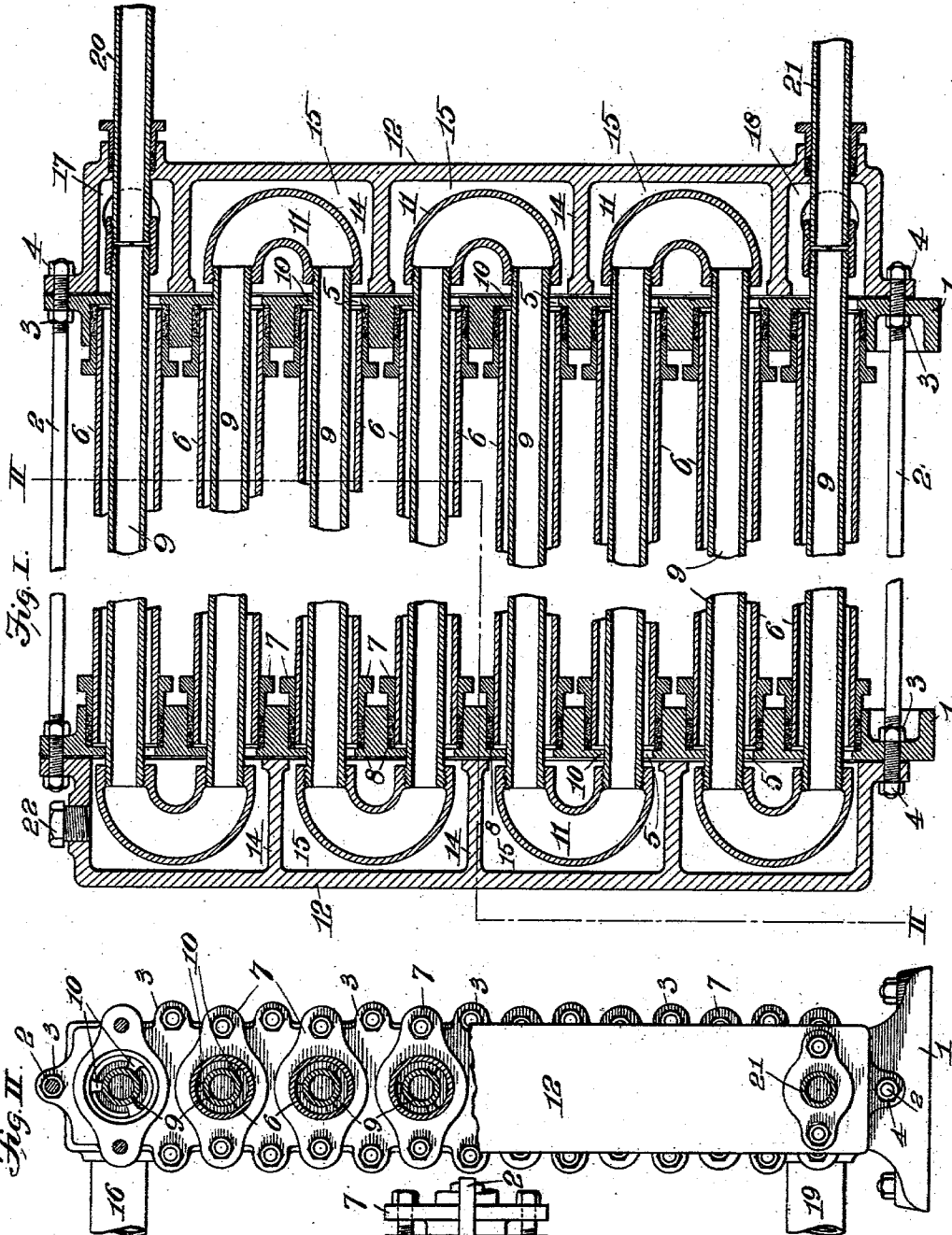


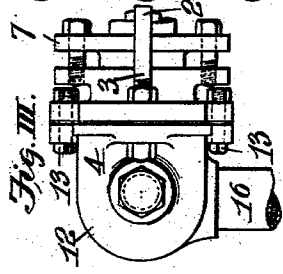
A. SIEBERT.
CONDENSING COIL.
(Application filed June 3, 1901.)

(No Model.)

2 Sheets—Sheet I.



Witnesses:
G. A. Pennington
W. Smith



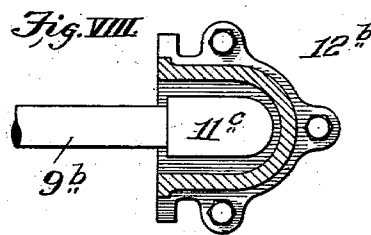
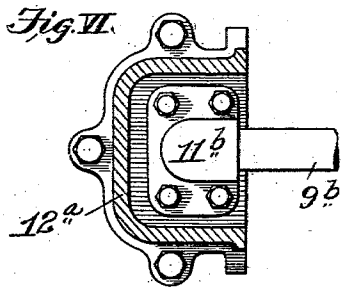
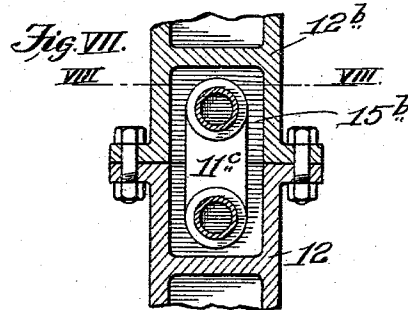
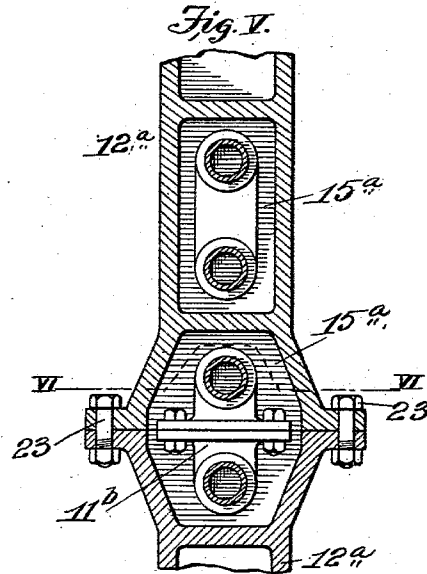
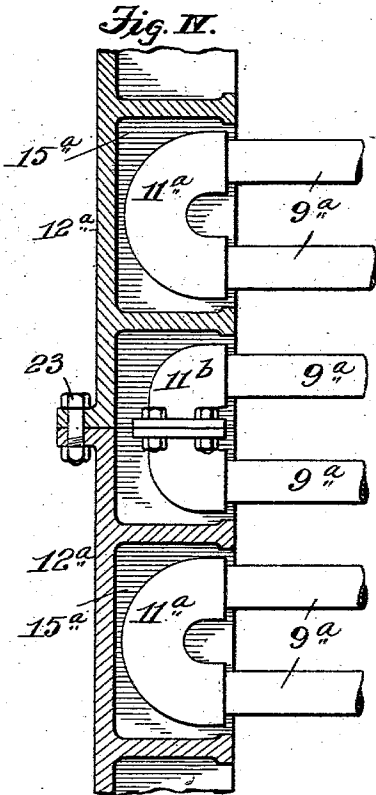
Inventor:
Alfred Siebert
 by *Wright & Co*
 Attys.

A. SIEBERT.
CONDENSING COIL.

(Application filed June 8, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

G. A. Pennington
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Inventor:

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UNITED STATES PATENT OFFICE.

ALFRED SIEBERT, OF ST. LOUIS, MISSOURI.

CONDENSING-COIL.

SPECIFICATION forming part of Letters Patent No. 694,797, dated March 4, 1902.

Application filed June 3, 1901. Serial No. 62,896. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SIEBERT, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Condensing-Coils, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of apparatus used in connection with refrigerating machinery for reducing the gas used in such machinery to a liquefied state after it has been passed through the machinery in service as a refrigerant.

The invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a vertical sectional view taken centrally through a condensing-coil constructed according to my improvement. Fig. II is a view, partly in end elevation and partly in vertical section, taken on line II II, Fig. I. Fig. III is a top or plan view of one end of the coil. Fig. IV is a view, partly in section and partly in elevation, illustrating a sectional construction of the coil. Fig. V is a vertical cross-sectional view taken through the sectional construction illustrated in Fig. IV. Fig. VI is a horizontal sectional view, taken on line VI VI, Fig. V. Fig. VII is a view similar to Fig. V, showing a modification. Fig. VIII is a horizontal sectional view taken on line VIII VIII, Fig. VII.

The characteristic feature of novelty in my present improvement consists in the application of caps that inclose the return-bends of the gas-circulation pipes and provide for the application of water circulation around said return-bends to subject the gas passing there-through to the cooling action of the water in addition to its being subjected to such cooling action as it passes through the pipes intermediate of the return-bends. The construction whereby I obtain the desired circulation of water, as stated, will now be set forth in detail.

1 designates a pair of heads that are joined by tie-rods 2, which pass therethrough and are provided with nuts 3 and 4. The heads 1 are recessed and provided with apertures 5

at intervals, and mounted in the recesses in said heads are water-conducting pipes 6, surrounded by stuffing-box glands 7, that are seated in the recesses against suitable packing 8.

9 designates gas-conducting pipes mounted within the water-conducting pipes 6 and having their ends projected through the apertures 5 in the heads 1 and centrally supported in said pipes by lugs 10, that project into the apertures 5. These lugs 10 also prevent the ends of the water-conducting pipes passing entirely through the apertures 5 of the heads. The ends of the gas-conducting pipes 9 are united by return-bends 11, through which the gas passes to communicate into the succeeding pipe-sections.

12 designates caps seated at the ends of the coil and fitted to the outer faces of the heads 1, to which they are secured by bolts 13. Each of the caps 12 is provided with a series of partitions 14, by which the caps are divided into compartments 15, that contain the return-bends 11 of the gas-conducting pipes 9 and have communication with the water-conducting pipes 6 through the apertures 5 in the heads 1. It will therefore be seen that the water flowing through the pipes 6 is free to circulate through the apertures 5 into the compartments 15 and therefrom into the next succeeding water-conducting pipe to the opposite end of the condensing-coil and into the compartment 15, to which said succeeding pipe leads.

16 designates the water-inlet pipe that is connected to one of the caps 12 and enters a compartment 17, that has communication with the first of the series of water-conducting pipes 6. The last of the series of water-conducting pipes communicates into a compartment 18 in the cap 12, referred to, and connected to said cap at the location of the compartment 18 is an outlet-pipe 19. The uppermost gas-conveying pipe 9 has connected to it a gas-inlet pipe 20, and the lowermost pipe 9 has connected to it an outlet-pipe 21, through which the liquefied gas is conducted from the coil.

22 designates a plug that closes an aperture in one of the caps 12, upon the removal of which plug opportunity is afforded for the de-

tection of leakage of gas within the condensing-coil, such detection being rendered possible by the escape of gas orders through said aperture when the plug is removed.

5 It is obvious that with the construction of condensing-coil herein described the cooling action of the water upon the gas conducted through the coil is greatly enhanced and the gas much more rapidly liquefied by reason of
 10 the return-bends of the gas-conducting pipes being inclosed within compartments through which the water circulates, so that the gas is subjected to the cooling action of the water while passing through said return-bends in
 15 addition to its being subjected to the cooling action of the water while passing through the pipe-sections of the coil only, as is the case in condensing-coils in which the return-bends of the gas-conducting pipes are not subjected to
 20 circulation of water thereabout.

In Figs. IV to VIII, inclusive, I have shown constructions whereby the condensing-coil may be built up in sections, thus providing an apparatus of "knockdown" form and one
 25 that is more convenient with respect to handling, shipment, and setting up, as the sections may be put together at the place of manufacture and shipped ready for setting up, thereby requiring simply assemblage of
 30 the sections to be in condition for use.

In the construction shown in Figs. IV, V, and VI the end caps of the coils are composed of sections 12^a, having opposing flanges, that are joined by bolts 23 and contain the
 35 compartments 15^a, which receive the return-bends 11^a of the gas-conducting pipes 9^a. The compartment 15^a, located at the junction of the cap-sections 12^a, is enlarged, as seen in Fig. V, to provide sufficient space in the use
 40 of a sectional return-bend 11^b.

In Figs. VII and VIII, I have shown the compartment-caps 12^b of sectional form, but containing compartments 15^b of uniform size to receive the gas-conducting pipe return-
 45 bends 11^c where such return-bends are made of uniform size and the section return-bend

shown in Figs. IV, V, and VI is dispensed with.

I have described the coil herein set forth for use as a condensing-coil, but wish it understood that I do not limit myself to its use for this specific purpose, as it is obvious that it might be used as a cooling-coil for cooling liquids. Neither do I limit myself to the passage of the gas or liquid through the inner
 55 pipes of the coil and the cooling agent through the outer pipes, inasmuch as it is evident that the gas or liquid to be cooled might be without departing from my invention conducted through the outer pipes of the coil
 60 and the cooling agent be conducted through the inner pipes.

I claim as my invention—

1. In a coil of the class described, the combination of a pair of apertured heads, a series of outer conducting-pipes secured within the apertures of said heads, caps fitted to said heads through which said outer pipes communicate, a series of inner conducting-pipes located within said outer conducting-pipes,
 65 return-bends connecting the ends of said inner conducting-pipes, and means mounted within the apertures of the heads preventing the passage of the outer pipes and supporting the inner pipes.
 75

2. In a coil of the class described, the combination of a pair of apertured heads, a series of outer conducting-pipes, secured in the apertures of the heads, caps fitted to said heads and provided with compartments into
 80 which said outer pipes communicate, a series of inner conducting-pipes located within said outer pipes, return-bends connecting the ends of said inner conducting-pipes and located in the compartments of said caps, and
 85 lugs mounted within the apertures of the heads preventing the passage of the outer pipes and supporting the inner pipes.

ALFRED SIEBERT.

In presence of—
 E. S. KNIGHT,
 M. P. SMITH.