

(No Model.)

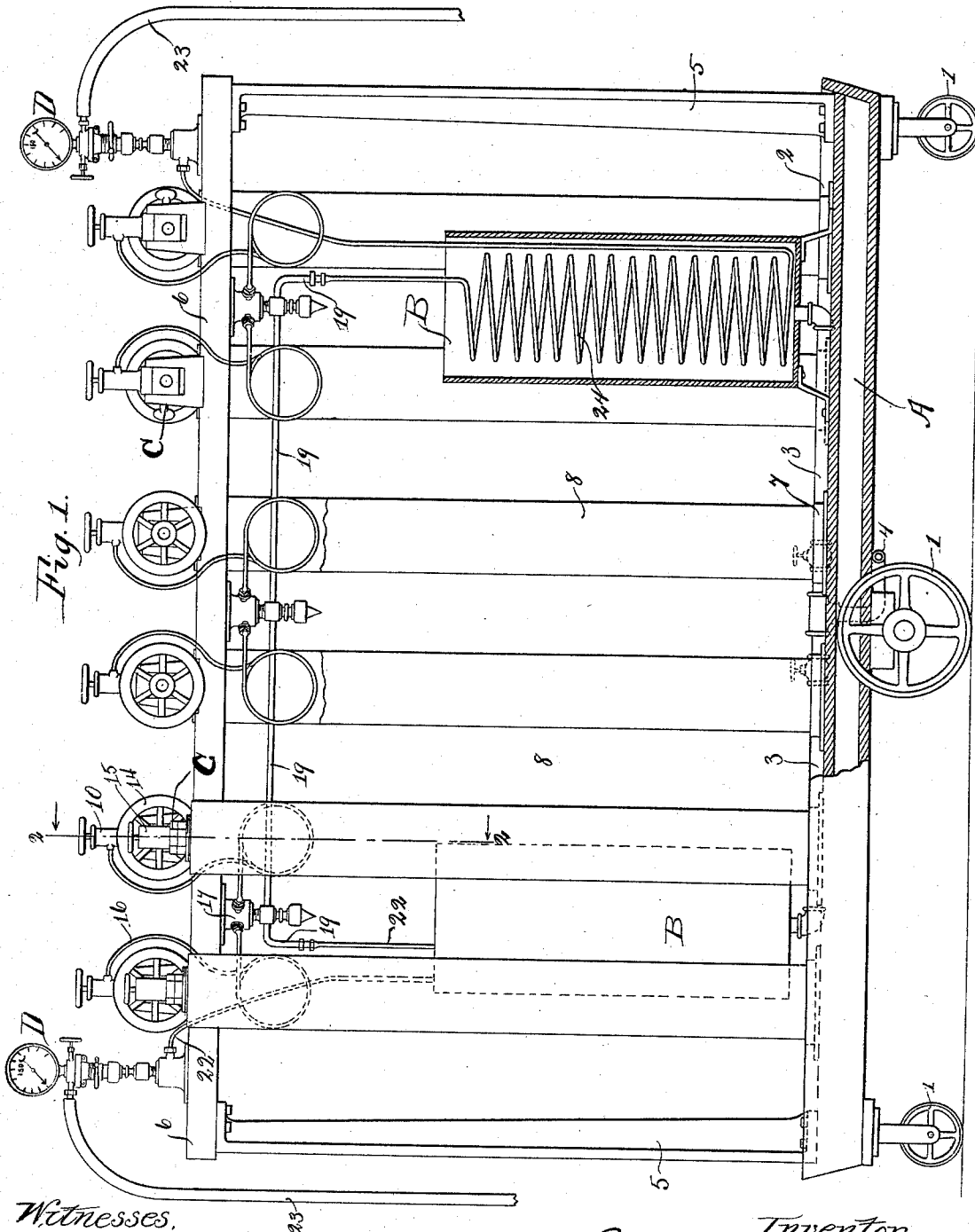
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C. F. A. CONVERT.

APPARATUS FOR RELEASING CARBONIC ACID GAS.

No. 518,587.

Patented Apr. 24, 1894.



Witnesses,
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(No Model.)

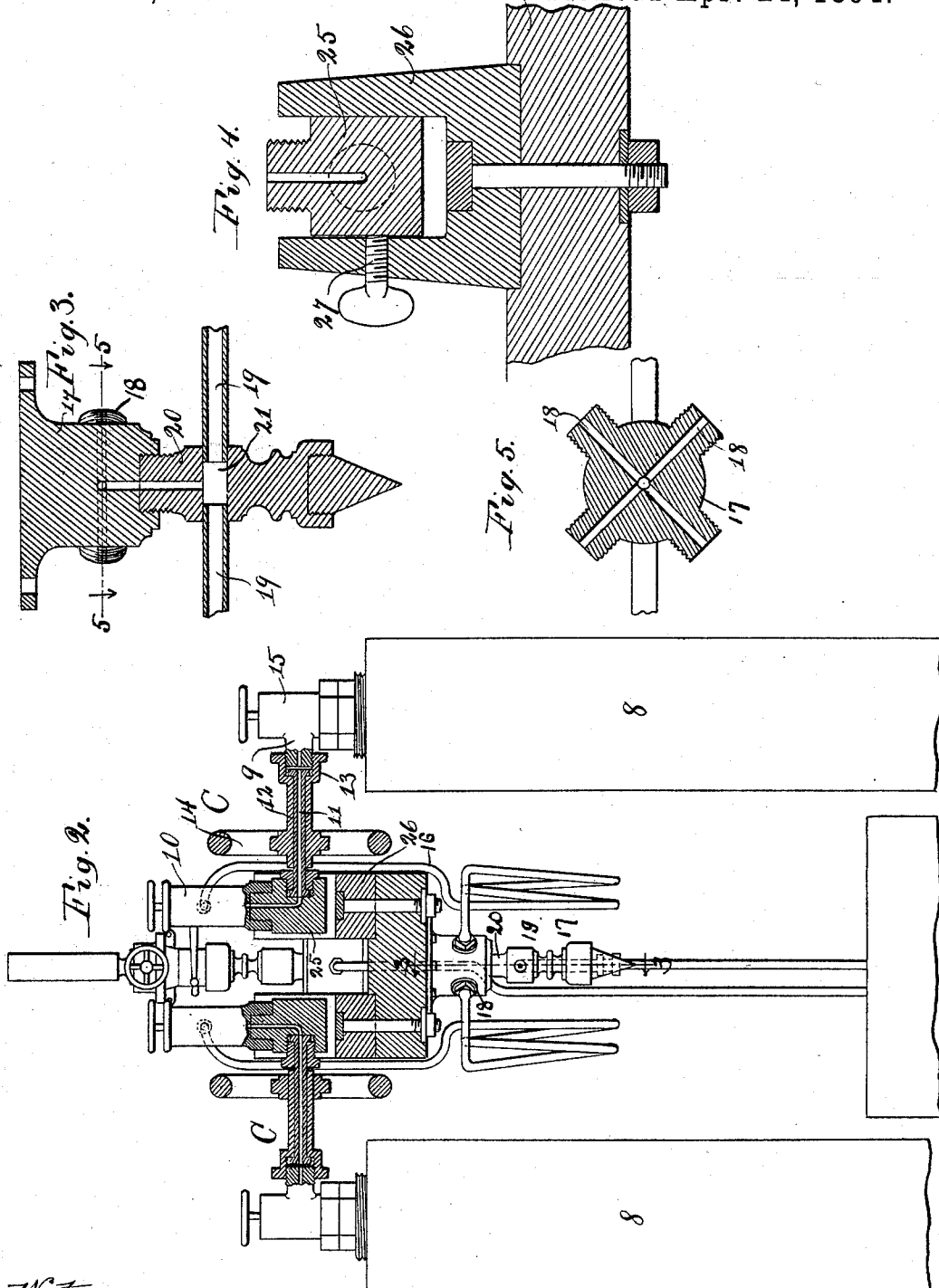
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UNITED STATES PATENT OFFICE.

CHARLES F. A. CONVERT, OF CHICAGO, ILLINOIS.

APPARATUS FOR RELEASING CARBONIC-ACID GAS.

SPECIFICATION forming part of Letters Patent No. 518,587, dated April 24, 1894.

Application filed April 18, 1893. Serial No. 470,832. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. A. CONVERT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods of and Apparatus for Releasing Carbonic-Acid Gas; and I 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.

This invention relates to a novel apparatus for releasing carbonic acid from the drums in which it is contained, and conducting it to such place or places where it is desired to carbonate liquids.

The object of this invention is to provide an apparatus to accomplish the above stated object in an expeditious and efficient manner.

The invention consists in the features of construction and combinations of parts of the apparatus, all of which is hereinafter fully described and specifically claimed.

In the accompanying drawings illustrating my improved apparatus, Figure 1 is a side elevation, partly in section, of an apparatus constructed in accordance with my invention. Fig. 2 is a fragmentary view partly in elevation and in cross section on the line 2—2 of Fig. 1, and on an enlarged scale. Fig. 3 is a fragmentary detail sectional view on the line 3—3 of Fig. 2. Fig. 4 is a fragmentary detail view. Fig. 5 is a section on the line 5—5 of Fig. 3.

In the art, as at present practiced, the carbonic acid employed for carbonating beer and other beverages is contained within drums or cylinders in a liquid state. In releasing said gas from the drums to inject into the beer or other beverage, great trouble has been experienced by reason of the rapid expansion of the acid, in evaporating, due to the removal of pressure under which it is held in the drums, and this rapid evaporation of the acid has the effect of producing such intense cold as to clog the apparatus so that it is necessary to discontinue the operation and get the parts in working order. To obviate this objection I lead the pipes or passages through which the acid passes on its way from the drums to the point where it is used through suitable devices for heating said pipes, so as

to reduce the temperature of the acid to counteract the cold due to its expansion. In this way I avoid the clogging of the parts of the apparatus so that the operation can be carried on continuously. I further employ a pressure regulating device interposed in the pipes or passages through which the acid passes and located between the heating apparatus and the outlet end of such pipes or passages. This pressure regulating device serves to reduce the pressure of the acid, so that when it is mixed with the liquid to be carbonated in the gaseous state too much expansion will not occur.

In the accompanying drawings I have shown an apparatus constructed in accordance with my invention, and will now proceed to describe the same.

A indicates a platform upon which all the apparatus is mounted and which is conveniently supported by wheels 1 so that it can be easily moved from place to place. The platform A is provided with an uprising flange 2 around its upper edges to make a trough to receive any drippings from the apparatus supported thereon. Mounted upon said platform are cylinders B open at their upper ends and communicating at their lower ends with pipes 3 for supplying steam thereto to heat water which may be contained within said cylinders B. The pipes 3 are coupled to a supply pipe 4 communicating with a suitable source supplying steam. Near each end of the platform is located a post 5 and upon the upper ends of these posts is secured a beam 6 upon which the remaining parts of the apparatus are mounted.

In accordance with the principle involved by my invention the apparatus is arranged for use in connection with any desired number of carbonic acid drums to be emptied, and it will be understood, therefore, that the number of heating cylinders B can be varied in accordance with the capacity of the apparatus, and that further the number of valves for controlling the escape of the acid from the drums can be varied. In the present instance, however, I have illustrated an apparatus for emptying six drums at the same time, and for this purpose it is necessary to secure the best effects in the most efficient manner to provide an apparatus capa-

ble of holding twelve drums, so that while six of these drums are being emptied six more can at the same time be replaced, so that as soon as the first six are emptied the emptying of the remaining drums can be commenced while the emptied drums can be replaced. Upon the platform A are arranged a plurality of sockets or bases 7 in which the lower end of the drums 8 that contain the carbonic acid can rest, and above each of said sockets and mounted upon the beam 6 I arrange the valve and coupling C, by means of which the drum can be coupled with the valve and the escape of the acid controlled. As the valves and coupling devices are similarly constructed a description of one will suffice.

The drums 8 are provided at their upper ends with a nozzle 9 which extends at right angles to the drum and is screw threaded. Mounted upon the beam 6 is a valve 10 that is provided with a lateral branch pipe 11 extending outwardly, and upon said branch pipe 11 a coupling sleeve 12 is revolubly mounted and provided at its outer end with a screw-threaded enlargement 13 to receive the screw-threaded nozzle 9 of the drum 8. In this way it will be seen that when it is desired to connect the drums 8 with the valve 10 said drums 8 are first mounted in their sockets 7 with the nozzle 9 turned toward the valve and located within the end of the enlargement 13 of the coupling sleeve. Then by turning said coupling sleeve 12, by means of the hand-wheel 14, the branch pipe 11 of the valve and the end of the nozzle 9 will be forced together with their openings opposite each other to make a tight joint between said parts. The drums 8 are, of course, controlled by separate valves 15 in the usual manner. In this way it will be seen that by opening the valve 15 of the drum and the valve 10 of the apparatus the acid can escape from the drum, and leading from the valve 10 is a pipe or passage 16 that leads to a coupling 17. The said coupling 17 is provided with a plurality of ports 18, as clearly shown in Fig. 5, so that a plurality of the pipes 16 leading from several of the valves 10 can communicate at this point. In the instance illustrated I connect four of said valve stems with each coupling 17 and therefore use three of such couplings, and these are fastened to the lower post of the beam 6. All of said couplings are connected with each other by pipes 19 that extend between the same and communication is established between the pipes 19 and said couplings 17 by means of a coupling 20 communicating with the coupling 17 and having two ports 21. In this way it will be seen that communication can be established with the said pipes 19 from all of the drums. In an apparatus of this kind I prefer to employ two pipes or passages to convey the carbonic acid from the apparatus to the place where it is used, and in accordance therewith I employ two pressure regulating devices D with which the line of pipes 19 com-

municate at their opposite ends by means of pipes or passages 22 connected at their opposite ends with the ends of the pipes 19 and with the inlet port of said pressure regulating device. The pipes 23 communicate with the outlet ports of said pressure or regulating devices and are used to convey the gas to the point where it is to be used.

I pass the pipe 22 through a suitable device for heating the same to counteract the effect of the cold produced by the rapid expansion of the acid, and in the particular construction shown I coil the pipe 22 and locate said coil within the cylinder B upon the platform. The said cylinder B can, of course, be filled with hot water and the acid in passing through the coil of pipes therein, indicated by 24, will be raised in temperature.

As a still further improvement I have constructed my apparatus so that it can accommodate any drum placed therein. In regard to this feature it may be well to state that although all the drums are of the same capacity, yet it is found in practice that the said drums vary in length so that the nozzle 9 of the drum would not be opposite the end of the coupling sleeve in all cases, unless the drums were of the same exact length. To overcome this objection the valve 10 is made adjustable in height upon the beam 6, and in the particular construction shown the base 25 of said valve 10 is located within a guide plate 26 fastened upon the beam 6 and is free to slide up and down therein except when held rigidly by a thumb screw 27 that passes through the sides of the guide 26, as shown in Fig. 4. To permit the up and down movement of the valve 10 a flexible connection is interposed in the pipe 16 connecting said valve with the coupling 17, so as to permit such movement of the valve and attain the communication between said parts. Such yielding connection between the valve and the coupling 17 can be attained in various ways, but as a preferred construction I make several turns in the pipe which serve as spring loops and thus form a yielding connection.

The parts being constructed and arranged as above described, the operation is as follows: When the drums are placed within their sockets a thumb screw 27 controlling the valve 10 is loosened and said valve moved to bring the end of the coupling sleeve 12 opposite the nozzle of the drum. The drum is then coupled to the valve and the thumb-screw tightened to hold the parts rigidly in position. We will suppose, for illustration, that we are about to begin the operation of the apparatus. The full number of drums are then secured in place, but the valves of the drums on one side of the apparatus and the valves 10 on such side of the apparatus are closed. The valves of the drums and the apparatus on the other side are open and the carbonic acid allowed to pass through the valve and intermediate passages to the coils

22 where the carbonic acid is heated by the hot water in the cylinders, and then passes to the pressure regulating devices D and then through the pipes 23. It has been found heretofore that when the carbonic acid expands in the chamber of the pressure regulating device, the intense cold produced causes congelation and clogs up the parts, thus stopping the operation. By heating the carbonic acid before it reaches the pressure regulating device I have found that the intense cold is counteracted by the heat thus imparted to it and congelation is effectually avoided. When these six drums are emptied their valves and the valves of the apparatus with which they are connected are closed, and then the valves of the other drums and the corresponding valves of the apparatus are opened and the operation continued. The emptied drums are then uncoupled from the apparatus and removed and replaced by full drums, which, when the drums are being used or emptied, are brought into play, and so on.

I claim as my invention—

1. In an apparatus of the kind specified, the combination with the main frame, of a valve adjustably mounted thereon, a coupling upon said valve, and a yielding connection between said valve and a coupling 17 upon the main frame and establishing communication between said parts, and pipes or passages communicating with said coupling 17, substantially as described.

2. In an apparatus of the kind specified, the combination with the main frame, of a valve adjustably mounted thereon, a coupling upon said valve, a yielding connection between said

valve and a coupling 17 in the main frame consisting of a flexible pipe or passage communicating at its opposite ends with said valve and coupling, and pipes or passages communicating with said coupling 17, substantially as described.

3. In an apparatus of the kind specified, the combination with the main frame, of a plurality of valves mounted thereon and provided with couplings, a coupling 17 upon said main frame, a plurality of pipes or passages communicating with said valves and with said coupling 17, and pipes or passages leading from said coupling 17, substantially as described.

4. In an apparatus of the kind specified, the combination with the main frame, of a plurality of valves adjustably mounted thereon and provided with couplings, a coupling 17 upon said main frame, a plurality of yielding connections between said valves and coupling 17 and establishing communication between said parts, and pipes or passages leading from said coupling 17, substantially as described.

5. In an apparatus of the kind specified, the combination with the main frame, of a guide plate 26 mounted thereon, a valve adjustably secured upon said guide plate and provided with a coupling, and pipes or passages leading from said valve, substantially as described.

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

CHARLES F. A. CONVERT.

Witnesses:

HARRY COBB KENNEDY,
RUDOLPH W. LOTZ.