H. W. JORDAN.

MIXING VESSEL.

APPLICATION FILED JAN. 31, 1911.

1,036,253. Patented Aug. 20, 1912

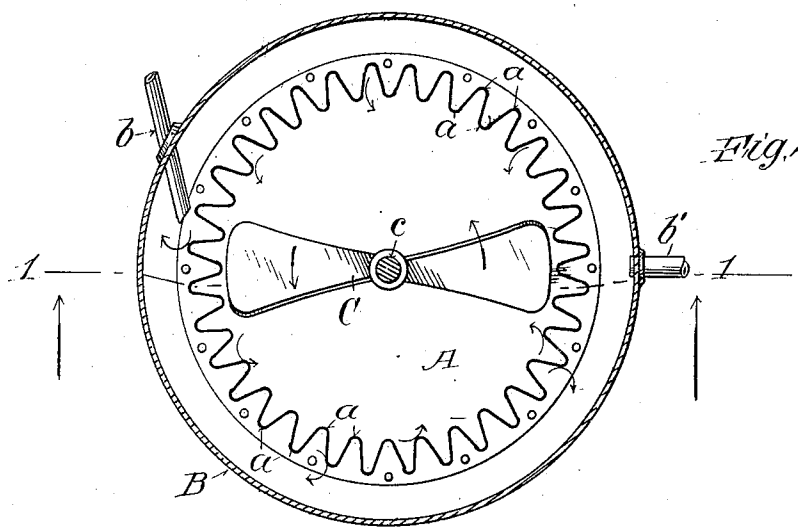

Fig. 2.

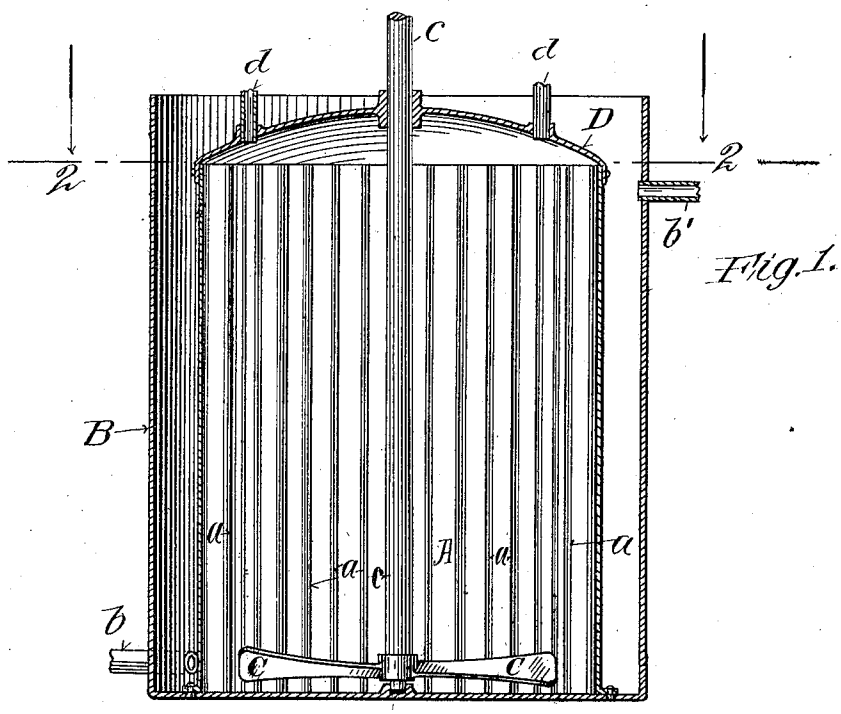

Fig. 1.

Witnesses:
C. M. Benjamin
W. L. Fawcett.

Inventor
Harry W. Jordan
By his Attorney
Clarkson A. Collins.

UNITED STATES PATENT OFFICE.

HARRY W. JORDAN, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE SOLVAY PROCESS COMPANY, OF SOLVAY, NEW YORK, A CORPORATION OF NEW YORK.

MIXING VESSEL.

1,036,253. Specification of Letters Patent. Patented Aug. 20, 1912.

Application filed January 31, 1911. Serial No. 605,756.

To all whom it may concern:

Be it known that I, HARRY W. JORDAN, a citizen of the United States, residing in the city of Syracuse, in the county of Onondaga and State of New York, have invented a new and Improved Mixing Vessel, of which the following is a specification.

My invention relates generally to vessels employed in mixing materials of a liquid nature, more particularly those by the admixture of which chemical reactions are effected, by which reactions heat is developed or for the effecting of which heat is required.

As is well known in the mixing of many substances to form new compounds, a considerable degree of heat is developed, in some cases to such an extent that precautions have to be taken to prevent overheating, with undesirable or dangerous consequences. Heretofore such overheating has been prevented by mixing the chemicals in a cylindrical vessel surrounded by a water jacket and by limiting the quantity of combining materials so that the amount of heat developed should be inconsiderable.

The object of my improvements is to provide a mixing vessel of such construction that the heat generated shall be more efficiently removed than heretofore, to the end of a more rapid admixture of materials and in greater quantity than has been possible. This I accomplish by giving to the wall of the mixing vessel such a shape or configuration that all portions of the material within the vessel are quickly and successively brought in contact therewith and impart their heat thereto as they are moved about by the mixer while at the same time the cooling water on the outside of the mixing vessel is brought into contact with the wall thereof in such manner as to more efficiently remove the heat imparted thereto by the hot material within.

The invention will be best understood by reference to the accompanying drawings, illustrating an embodiment thereof, Figure 1 of which shows a vertical section of the mixing vessel and Fig. 2 shows a horizontal section of the same on the line 2—2, Fig. 1.

Referring to the drawings A indicates the mixing vessel, the wall of which is provided, within and without, with vertical projections, *a*, *a*, formed, in the present case by making the wall with a corrugated section, as shown.

B indicates an outer wall surrounding the mixing vessel A, the interposed space forming a water jacket into which a stream of water is admitted through pipe *b*, which is preferably set tangential to the wall of the mixing vessel. The admitted water escapes from the upper part of the water jacket, as through pipe *b'*.

Within the mixing vessel A is a rotary stirrer, C, mounted on a shaft, *c*, of any usual or convenient construction. The vessel A may be provided with a suitable cover, D through which pass inlet pipes, *d*, *d*.

In the operation of the device the material within the mixing vessel, which tends to receive a rotary motion by the action of the stirrer, instead of partly following the wall of the vessel and partly remaining at the center, as is the tendency in the case of smooth walled vessels, is broken up into currents, by striking against the ribs *a*, *a*, which are turned toward the center of the vessel, somewhat as indicated by the arrows in Fig. 2, so that a quick and thorough mixing of the mass is effected and all its parts are successively brought against the wall of the mixing vessel and are cooled by contact therewith. In the same manner the stream of water admitted to the water jacket through pipe *b*, and impinging on the wall of the mixing vessel, instead of following directly around the wall, is broken up by contact with the ribs or projections so that the outer and cooler portions of the water are continually brought into contact with the wall and remove the heat transmitted therethrough.

It will be understood that the vertical ribs or extensions by means of which the desired movement is given to the liquids may be in various forms, which will readily occur to those skilled in the art, and I do not limit my invention to the use of the particular form shown, though I have found this efficient and desirable. It will be evident also that my invention can be used with equal advantage in cases where heat is not developed by the reactions in the mixing vessel and where it is desired to transmit heat from the water jacket to the mixing vessel to promote the reactions therein.

What I claim as new and desire to secure by Letters Patent is:

In a mixing vessel the combination of a vessel wall having, within and without, vertical corrugations, a horizontally rotating

stirrer within the vessel, a water jacket surrounding the vessel and an inlet pipe to said water jacket tangential to the vessel wall, whereby the liquid within and without the vessel is caused to move intermittently away from the wall thereof.

In testimony whereof, I have hereunto subscribed my name, this 17th day of January A. D., 1911.

HARRY W. JORDAN.

Witnesses:
HARRY DUANE BRUCE,
FRED R. HERTZOG.