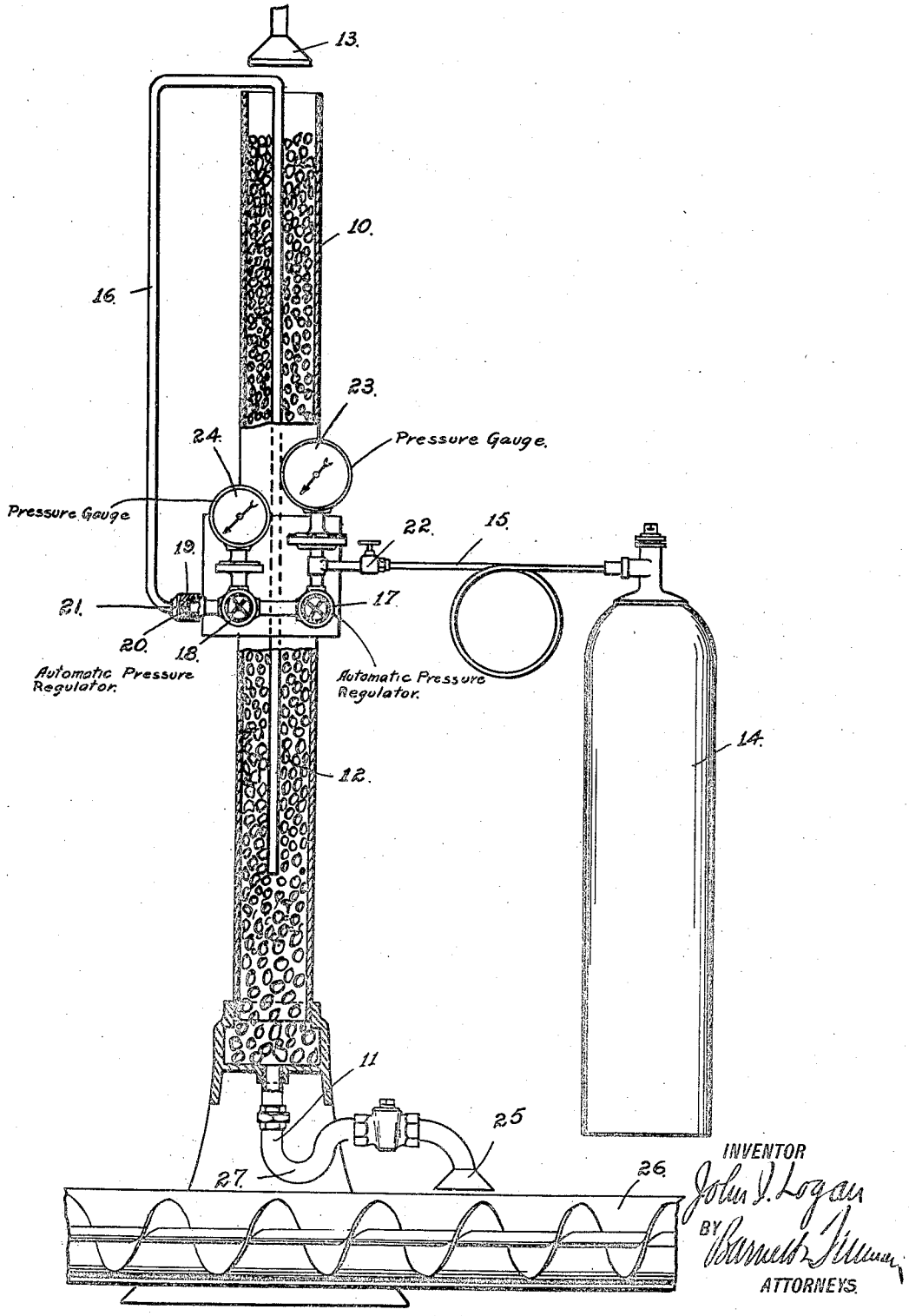
J. I. LOGAN.

METHOD OF TREATING GRAIN.

APPLICATION FILED DEC. 14, 1916.

1,307,367. Patented June 24, 1919.



UNITED STATES PATENT OFFICE.

JOHN I. LOGAN, OF CHICAGO, ILLINOIS.

METHOD OF TREATING GRAIN.

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Application filed December 14, 1916. Serial No. 136,998.

To all whom it may concern:

Be it known that I, JOHN I. LOGAN, 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 Treating Grain, of which the following is a specification.

My invention relates to the treatment of wheat prior to grinding the same into flour, and a primary object of the invention is to provide an improved method of treatment of the grain whereby the fiber and bran is toughened and its brittleness reduced and thereby rendered less likely to be pulverized during the milling of the grain. If the bran and the minute fibers of the wheat are dry, which is their ordinary condition prior to the milling operation, the grinding of the grain reduces them to a fine powder which cannot be completely separated from the flour by bolting. My improved method of treatment makes it possible to thoroughly and uniformly toughen the bran and fibrous portion of the berry so that instead of being pulverized this part of the grain is broken up into such form that it may be bolted out of the flour. As a result a better grade of flour may be produced, that is, a flour freer from fibrous particles and hence having better baking qualities than is possible with present methods. Or at least, assuming that the flour as now produced can be freed to a very large extent of the fibrous portions of the grain, this is only possible by very close bolting of the flour, and as a certain amount of flour is left in the tailings so that successive re-boltings are necessary, the amount of flour of the first grade, according to present methods, is less in proportion than it need be. By treating the wheat berry in accordance with my process the yield of first grade flour, in comparison with the lower grades, is increased since the bran particles are larger and are, therefore, more easily bolted out.

A further object of the invention is to provide for the cleansing and sterilization of the outside of the wheat berry so as to remove or destroy bacterial growths. Various cleansing and scouring methods have been used in preparing wheat for milling, and these methods are more or less effective. They do not always, however, reach such organic growths, germs, or other impurities as may have lodged in the crevices or slight indentations on the surface of the berry. The treatment provided by my invention, besides toughening the fibrous constituent of the grain both on the outside of the berry and within it, as above stated, operates to effectively cleanse the grain on the outside and destroy entirely mold, rust, or other organic growths.

The process consists essentially of impregnating the grain with and causing the same to be permeated by a solution of water and chlorin. Water alone does not penetrate the grain so as to reach the inner fibers or, if it penetrates at all, does not do so uniformly. I have found that a weak solution of chlorin will penetrate the integument of the berry, soften and toughen it, and also the net work of fibers within the berry. The presence of the chlorin in the flour and in the offal is not in any way deleterious. It apparently forms chlorids with certain constituents of the grain and these chlorids are perfectly harmless. The chlorin in the water also acts as a germicide and effectively destroys any bacterial growths on the outside of the grain, even those which are located in the crevices, indentations or creases in the integument, so that this treatment besides working an improvement in the milling operation removes a common source of contamination of the flour.

While the amount of chlorin may be varied without departure from my invention, and some variation will be necessary according to the character and condition of the grain, particularly as to the amount of moisture which the grain may contain, I prefer to use for average cases about one pound of pure liquefied chlorin gas to one hundred thousand gallons of water.

The accompanying drawing shows an apparatus suitable for carrying out my improved process.

Referring to the drawing, 10 is an absorption tower open at the top and closed at the bottom except for a discharge pipe 11. The tower is filled with pieces of porous material 12 not affected by chlorin, for example pumice stone. Water is introduced into the tower at the top by means of a spraying device 13. 14 is a carboy of liquefied chlorin gas from which gas is introduced into the open top of the tower through pipe 15, 16. Interposed between pipe sections 15 and 16

is an automatically operating controlling apparatus preferably constructed as follows: 17, 18 are two automatic pressure reducing valves of any suitable type, arranged tandem. Beyond the second valve 18 is a fitting 19. Extending across the same is a thin diaphragm 20 of non-corrosible metal, the diaphragm being formed with a minute perforation 21. 22 is a shut-off valve and 23, 24 are pressure gages, the former indicating the pressure on the high pressure side of the reducing valve 17, and the latter the pressure against perforated disk 21. By these arrangements a very delicate adjustment of the flow is possible. When the mechanism is once set the proper flow is maintained automatically.

The grain to be treated is carried under the spout 25 of the discharge pipe 11 by means of a conveyer 26, or other suitable device. Preferably the discharge pipe is formed with a downward bend or loop 27 which provides a trap to prevent the escape from the tower of any free chlorin gas.

It will be understood that the process is not in any sense limited to the particular type of apparatus above described.

I claim:

Improvement in the manufacture of wheat flour which consists in causing the grain before grinding to be permeated with a solution of chlorin and water.

JOHN I. LOGAN.