

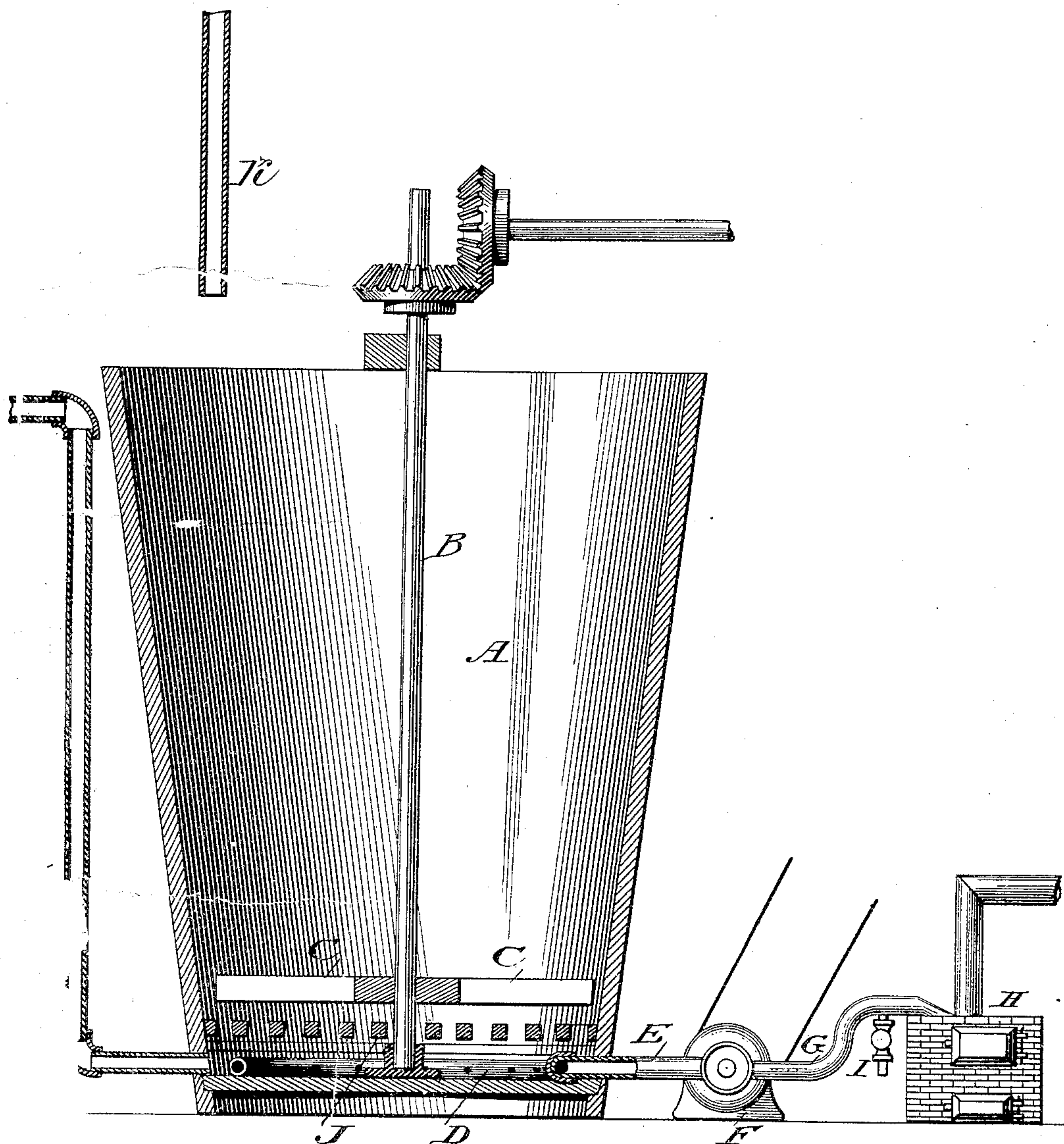
(No Model.)

C. W. COOPER.

PROCESS OF REMOVING LIME FROM HIDES.

No. 461,010.

Patented Oct. 13, 1891.



Charles W. Cooper

Inventor.

By his Attorneys  
J. C. Hawbridge  
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Witnesses.

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# UNITED STATES PATENT OFFICE.

CHARLES W. COOPER, OF BROOKLYN, NEW YORK.

## PROCESS OF REMOVING LIME FROM HIDES.

SPECIFICATION forming part of Letters Patent No. 461,010, dated October 13, 1891.

Application filed November 8, 1887. Serial No. 254,637. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. COOPER, of the city of Brooklyn, State of New York, have invented an Improved Method of Treating Hide, Skin, and other Animal Substances, in the manufacture of glue stock, for the purpose of neutralizing the caustic lime contained therein.

It is usual in the preparation of skins and hides for tanning, for the manufacture of glue stock, and for other purposes, to treat them with lime, the presence of which, would, in the subsequent operations of tanning or of the manufacture of glue, for many reasons, be undesirable. My invention is applicable to the treatment of hides which are to be subjected to a tanning process, but it is particularly intended by me to be applied to the preparation of such hides, skins, and animal substances as are to be subsequently used in the manufacture of glue stock, and it consists as hereinafter particularly described and claimed.

Heretofore the lime contained in skins and hides intended to be used for tanning purposes, or for the manufacture of glue stock, has been neutralized by subjecting them for a considerable time to the action of the atmosphere with the result that the lime contained in said hides and skins has, after a very long exposure to the atmosphere, been, to some extent, neutralized by the carbonic acid gas contained therein. This method of treatment, has been slow and imperfect. It has been proposed to neutralize the lime contained in hides and skins to be used for the purposes abovementioned by subjecting them, in a proper vessel, to the action of artificially prepared carbonic acid gas. This process and others which have been employed have produced more or less satisfactory results. I have discovered that the caustic lime contained in hides, skins, and other animal tissue, may be quickly and thoroughly neutralized by subjecting them while in water, to the action of carbonic acid gas, and I have found that the more thoroughly the hides and skins are agitated in the water to which the carbonic acid gas is introduced the shorter will be the time necessary for the neutralization

of the caustic lime contained therein, and the more perfectly and thoroughly will the process be carried out.

In the practice of my invention I have produced the necessary agitation of the mass treated in two ways,—first, by forcing a jet, or jets, of carbonic acid gas into the water in which the skins or hides were contained, at such pressure as to occasion an active agitation of the mass, and the consequent exposure of every part of the materials treated to the gas and the bath of acidulated water; and, secondly, by providing the vessel in which the hides and skins were treated with mechanical stirrers by which the water, and the skins or hides contained therein, were kept in a state of agitation during the admission thereto of a jet, or jets, of carbonic acid gas. The chemical action consequent upon the treatment of the caustic lime in the skins with carbonic acid gas results in the formation of inert carbonate of lime. Various mechanical devices may be employed to carry out my invention, a preferred form of one of which is shown in the drawings, in which

A is a tank or vessel preferably in the form of an inverted frustum of a cone. This tank is provided with a vertical axial revoluble shaft B adapted to be driven by any suitable power and gearing. This shaft is near its lower end provided with horizontal radial blades C C. Below these blades the tank is provided with a perforated diaphragm or lattice screen J, with a horizontal pipe D, which, longitudinally of its length, at suitable intervals is provided with orifices through which carbonic acid gas may be forced and fed to the tank. Carbonic acid gas is produced in a furnace H, of any well known construction, or it is otherwise derived from any suitable source of supply; and is fed through a pipe G to a blower F by which it is driven through the pipe E to the orificed discharge pipe D. Should the gas employed be of a high temperature, it should be led through proper cooling chambers, or through extended lengths of pipe and be thus cooled before it reaches the blower; so also the pipe which conducts the gas to the blower should be provided with a valve, as at I, to permit of the introduction



of air for the dilution of the gas, should such dilution be necessary.

Such being the construction of the apparatus shown in the drawings, its operation, in the practice of my invention, is as follows: 5 The tank A is charged with a proper quantity of hides, skins, or animal substance which is to be manufactured into glue stock, and the tank is, through the water supply pipe K, filled 10 with water until it rises to the height of the upper end of the water discharge pipe L, which communicates with the lower end of the tank. Revolution is given to the shaft B and blades C C, and carbonic acid gas is fed 15 or forced into the tank through the orificed pipe D. In the apparatus shown in the drawings, in which no lid or cover is employed, the excess of gas, or that part of the gas which is not mechanically held in the water and 20 eventually combined with the caustic lime in the skins or hides treated, escapes from the tank into the open air. The skins treated, usually, in addition to the lime contained therein, contain upon their surfaces undissolved lime and other foreign materials. These 25 substances, in the practice of my invention by the use of the devices shown in the drawings, are washed off by the water fed to the tank from the pipe K and are mechanically removed by the water escape pipe L. 30

I do not confine myself in the practice of my invention to the devices shown in the drawings, although I have found devices of that construction to effectually operate to 35 keep the hides and skins treated in proper agitation to be quickly and thoroughly acted

upon by the carbonic acid gas introduced thereto.

I do not confine myself to the agitation of the hides, or other materials treated, by mechanical means, as I have found it possible 40 to practically and successfully neutralize the caustic lime contained in these substances by introducing a sufficient volume of carbonic acid gas to a vessel containing water and 45 skins to actively agitate the mass. The essential feature of my invention is the treatment of hides, skins, or other animal substances containing lime, in water, with carbonic acid gas, whereby a proper mechanical 50 distribution of the gas, and its application and contact, for a sufficient time, to and with every part of the material treated, is insured, and a quick and thorough neutralization of the lime thereby obtained. 55

Having thus described my invention, I claim:—

1. The method of removing lime from hides, skins, or other animal substance, which consists in subjecting said materials in a bath of 60 water to carbonic acid gas, as specified.

2. The method of removing lime from hides, skins, or other animal substance, which consists in subjecting said materials to carbonic acid gas and agitation in water, as specified. 65

In testimony whereof I have hereunto signed my name this 4th day of November, A. D. 1887.

CHAS. W. COOPER.

In presence of—

WM. C. STRAWBRIDGE,  
R. W. RAYMOND.