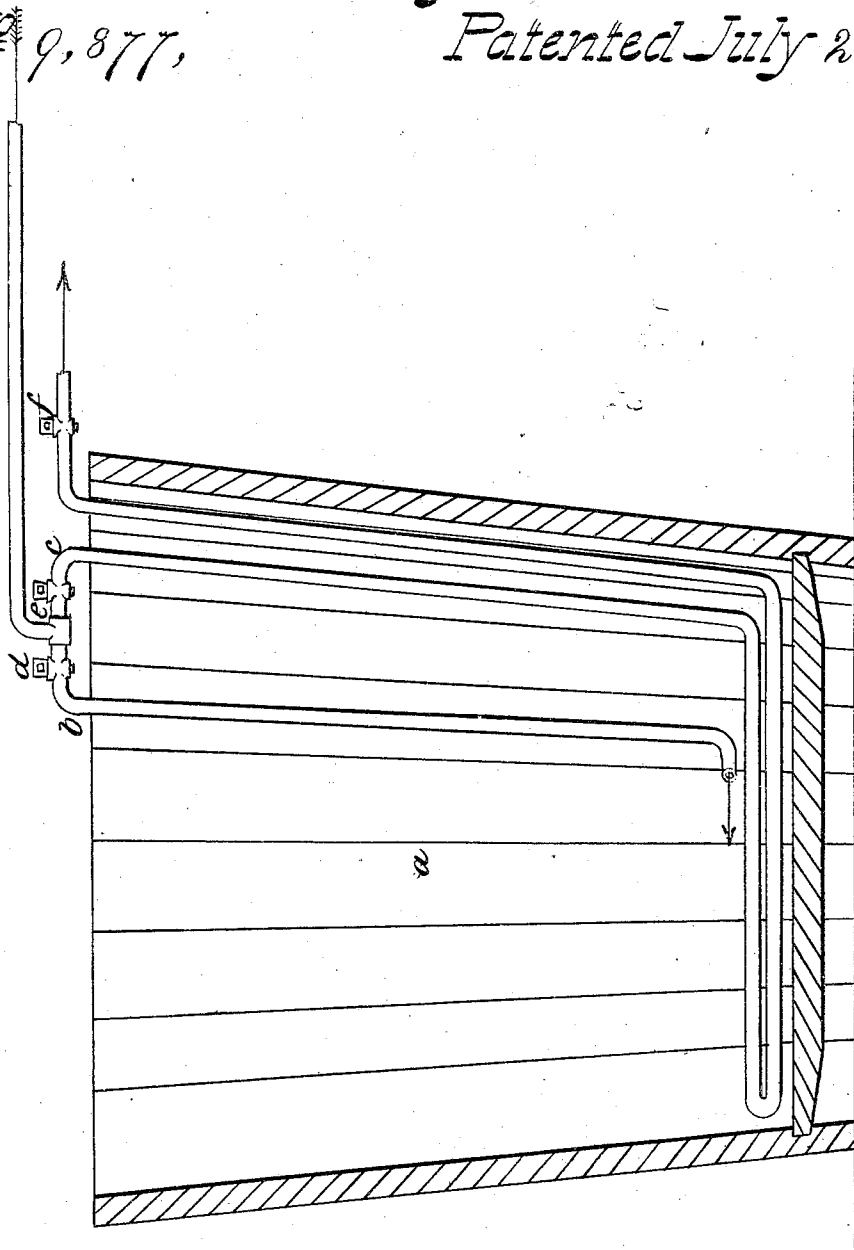


*D. A. James,*  
*Making Glue,*

*No. 9,877,*

*Patented July 26, 1853.*



# UNITED STATES PATENT OFFICE.

DAVID A. JAMES, OF CINCINNATI, OHIO.

## IMPROVEMENT IN PROCESSES FOR MAKING GLUE.

Specification forming part of Letters Patent No. 9,877, dated July 26, 1853.

*To all whom it may concern:*

Be it known that I, DAVID A. JAMES, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in the Process of Manufacturing Glue; and I do hereby declare the following to be a full, clear, and exact description of the nature and operation thereof, reference being had to the annexed drawing, making part of this specification, in which the boiling apparatus is represented by vertical section.

By the improved processes herein explained I am enabled to manufacture from a given material a better article of glue, and with greater economy and dispatch, than by the customary modes.

The usual mode of preserving the glue scraps received from the tanneries has been by storing them as they accumulate during the winter in vats of strong lime-water—a mode of treatment involving much labor in rehandling and applying fresh lime, or, by neglect, a considerable loss from decomposition of the scraps.

It is to remedy these evils that the first part of my improvement is made, which consists in washing the scraps thoroughly by small quantities in a thick cream of lime and piling them under the protection of a roof in layers forming an angle of about twenty degrees with the horizon—that is, commencing in one corner of the space to be occupied, I constantly preserve that part of the pile the highest by making the additions all over the surface—the extent of the piles either in height or surface being of little consequence. By this treatment the danger of decomposition is in great measure avoided, partly by the draining off of the superfluous water, but mainly by the coating of milk of lime received by each shred of the animal matter before going into the pile. By the old method the lime contained by the scraps is neutralized by atmospheric exposure at the expense of much labor and more time, extending generally to the holding of the winter's receipts until the succeeding autumn, as the heat of summer renders it necessary to suspend the manufacture. This protracted exposure, besides necessitating a large amount of capital to lie idle, subjects the material to injury from partial decomposition, dust, discoloration, &c., all which, together with part of the expense, is avoided by the following method of treat-

ment: Sulphuric acid is an especially useful agent, as from the insolubility of the resulting compound it is left as a part of the residuum in the tubs at the end of the boiling. I take the moist scraps direct from the heap, and after thoroughly washing to free them from the superficial lime add to them dilute sulphuric or other acid to decompose any calcareous compounds or neutralize any free lime, when after another careful washing they are ready for the boiling. The open steam-jet, which of late years has superseded the highly-objectionable furnace boiling, is itself objectionable from the continual addition of water and the consequent dilution of the glue-size, thus rendering the boiling of glue by means of it a very uncertain operation under the most favorable circumstances, even with dried material, while from the recent scraps the manufacture would be quite impracticable, as they contain at the beginning of the operation more water than should be found in the sizing at the end of it. This position is illustrated by the following statement:

One hundred pounds recent scraps contain:  
Water ..... 78 parts  
Gelatine..... 11 parts  
Insoluble residuum ..... 11 parts

100 parts

Proportion of water to gelatine, seven to one; proportion required for laying on the nets for drying, three of water to one of gelatine; overplus of water, four. Sizing strong enough for exposure on the nets for drying contains three of water to one of resulting glue, and to produce a size of this strength by the evaporation of four-sevenths of the water I have provided means for using the heat of the steam without suffering inconvenience from its water of condensation. I therefore introduce another steam-pipe, which, passing into the tub, is coiled near the bottom in the form of a convolute (disposed in one or two planes, as may be most convenient) in as many turns as may be necessary, and, being returned, discharges its moisture outside of the tub.

The advantages claimed are of a very decided character and are as follows: The immediate appropriation of the material, thereby, besides effecting a saving of capital, avoiding the injury and direct loss from decomposition, discoloration, labor, &c., at-

tendant on the old method; rendering unnecessary the extensive preparations for drying the raw material; the saving of time and labor by boiling the material when in a less dry and refractory condition; the saving of storage room for the scrap; the superior quality of the product, arising in part from the sounder and more fit condition of the raw material and in part from the superior character of the boiling process, which, while it gives perfect control of the strength of the sizing—*i. e.*, its concentration—yet avoids all risk of injury to its gelatinizing properties by carbonization.

In the annexed drawing, *a* is the tub within which the glue scraps are boiled.

*b* is the open steam-pipe.

*c* is the close steam-pipe.

*d e* are cocks admitting steam to them.

*f* is a cock at the exhaust end of the pipe to regulate the pressure of steam within the coil, and consequently its heating power.

Having thus described the nature of my improvements in the processes of manufacturing glue, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The method, substantially as described,

of preservation and conversion into glue of the tanners' scraps, &c., by open piling successive layers of scrap coated by cream of lime, (in place of the lime-steeping heretofore resorted to,) followed by the application of sulphuric or other suitable acid, which, combining with the lime, prevents its deleterious action on the glue and supersedes the necessity of the atmospheric exposure now resorted to.

2. The combination, with the said previous treatment, the process, substantially as described, of making glue by means of the combination of direct and indirect steam acting in concert or separately, according to the stage of the process and the relative heat and moisture required, avoiding on the one hand the injurious scorching effects of the open furnace and on the other hand the serious inconvenience of undue dilution by the open steam-jet.

In testimony whereof I have hereunto set my hand before two subscribing witnesses.

DAVID A. JAMES.

Witnesses:

GEO. H. KNIGHT,

J. N. GETZENDANNER.