

UNITED STATES PATENT OFFICE.

BENNI BELLERSTEIN, OF NEUSS, GERMANY.

APPARATUS FOR CARBONIZING THE VEGETABLE MATTER IN WOOL.

SPECIFICATION forming part of Letters Patent No. 468,558, dated February 9, 1892.

Application filed February 2, 1891. Serial No. 379,867. (No model.)

To all whom it may concern:

Be it known that I, BENNI BELLERSTEIN, a subject of the German Emperor, residing at Neuss, Germany, have invented certain new and useful Improvements in Apparatus for Carbonizing the Vegetable Matter in Wool, of which the following is a specification.

This invention relates to an improved apparatus for carbonizing the vegetable matter in wool by means of vaporized acids.

It consists in the various features of improvement more fully pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical transverse section of my improved apparatus. Fig. 2 is a vertical longitudinal section of the same.

The letter *a* represents the acid-retort, made trough-shaped in case sulphuric acid and salt are used, and in the shape of an inclined plate in case muriatic acid is used. This acid is introduced drop by drop through funnel *a'* upon an elevated portion of the retort-bottom, so that the drops evaporate at once. If part of the acid should not thus evaporate, it is evaporated on the lower section of the retort-bottom. To better distribute the acid, it may be made to flow through a strainer.

To protect the retort, it is provided with a slide *w*, which is first reached by the acid and which better withstands its action.

h is the revolving carbonizing wool-receiving drum, turning in the frame of the machine on hollow trunnions *g* *i* and provided with a suitable lid, by means of which it may be charged or emptied.

Between the retort *a* and the drum *h* there is placed a superheater *b*. This superheater evaporates any liquid acid that may be carried up by the vapors and at the same time greatly elevates the temperature of the vapors themselves, so that their effectiveness is considerably increased. By this superheating arrangement one hundred parts of wool require but four parts of acid, and the duration of the process is reduced to one hour and less.

Within the superheater *b* there is placed a pair of overlapping partitions *c* *d*. These partitions prevent the direct inflow of the vapors into the drum and the consequent injection of moisture, and at the same time retain

the vapors in the superheater for a larger period to raise their temperature.

The partition *d* is provided with a valve or slide *e*, by which the drum may be entirely cut off from the retort. In this way, after the carbonizing operation is completed, the vapors may be kept out of the drum, so as not to interfere with the workmen.

The communication between the superheater and the drum is established by means of a pipe *f*, that enters the hollow trunnion *g*. The spent vapors pass out of the drum through the hollow trunnion *i* and into a channel *k*, leading to the chimney, to which they are forced by a suitable blower. The chamber of masonry *o*, inclosing drum *a*, is connected to a flue *k*² by means of a short upright flue containing damper *k'*. If the lid is raised from the drum to charge or empty the latter, the damper is opened to permit the escape of the vapors.

Beneath the retort *a* there is the furnace *a*², in which coke is used as a fuel. The heat passes around the retort into the superheater, and thence through pipe *m* to the chamber *o* surrounding drum *h*, so that the drum need not be directly heated during the carbonizing process proper. This causes a great saving of fuel. If during the discharge the heat is not to be conducted beneath the drum, it may by a suitable connection be conducted directly to the discharge-pipe *q*.

Before the carbonizing process begins a drying process must first take place. To this effect a furnace *n* is placed directly beneath the drum, from which the heat enters the chamber *o*, together with the heat from pipe *m*. A deflector or channel *p* prevents the heat of furnace *n* from striking the drum directly. The heat from the exit-pipe *q* is sucked by a ventilator to a pipe *r*. From this pipe the heat enters through tubes *r'* *s* and telescoping tube *t* into the superheater *b*. Fig. 2 shows the tube *t* lowered and coupled to the superheater, while in Fig. 1 the tube is raised and the connection is broken. When the tube is thus raised from off its tubular seat *b'* on the superheater, the latter is closed by a lid *b*². When properly reheated, the slide *e* is opened and the gases are introduced into the drum. The tube *s* is provided with

a valve *v*, that is opened during the drying operation. The spent heat is thus utilized, and any vapors that may form in the drum during the drying process are at once removed by the continuous admission of warm air. In this way the duration of the drying operation is shortened to one hour and less. If the valve *v* is closed, the heat escapes from pipe *r* into the chimney through a suitable valve.

10 What I claim is—

1. The combination of drum *h* with retort *a*, superheater *b*, partitions *c d*, and valve *e* between the drum and the superheater, substantially as specified.

15 2. The combination of drum *h* with retort

a, superheater *b*, a chamber *o*, surrounding the drum, and a tube *m*, that connects the superheater with said chamber, substantially as specified.

3. The combination of drum *h* with retort *a*, superheater *b*, furnaces *a² n*, and pipes *q r s t*, that connect the furnace *n* with the superheater, substantially as specified.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BENNI BELLERSTEIN.

Witnesses:

HANS FRIEDRICH,
AUG. V. PAPEN.