2 Sheets. Sheet 1.

G. A. Jasper,

Cooling Charcoal.

No. 101,019. Patented Mar. 22. 1870.

Fig. 1.

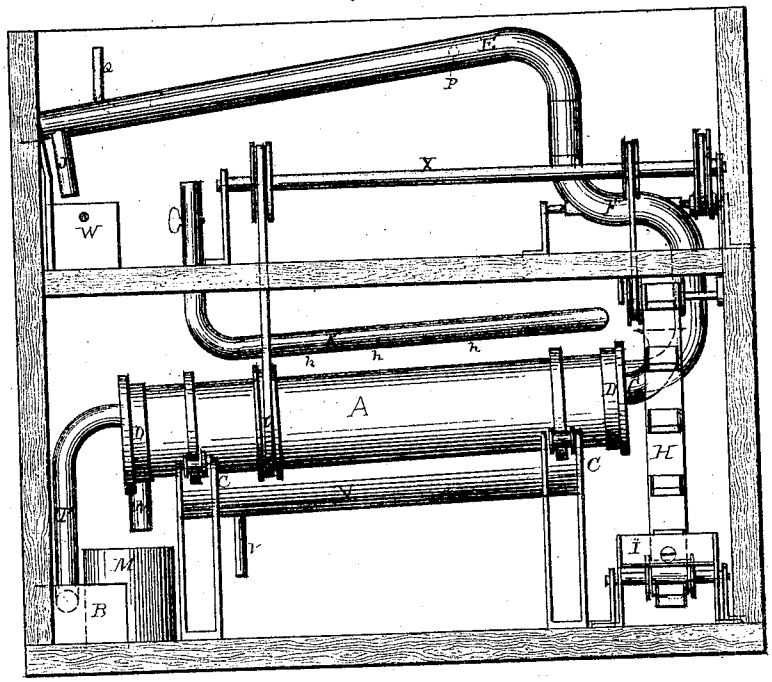
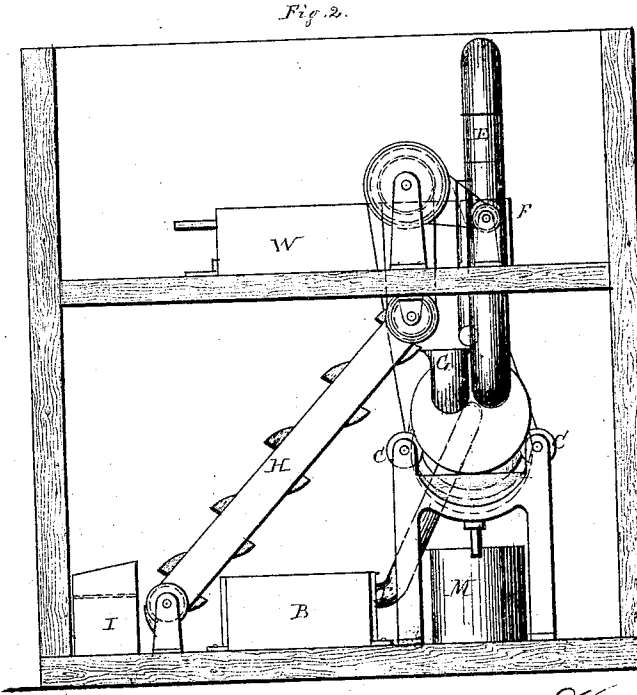


Fig. 2.



Witnesses:
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H. Farnam Smith

Inventor: G. A. Jasper

2. Sheets, Sheet. 2.

G. A. Jasper,

Cooling Charcoal.

No. 101,019. Patented Mar. 22. 1870.

Fig. 3.

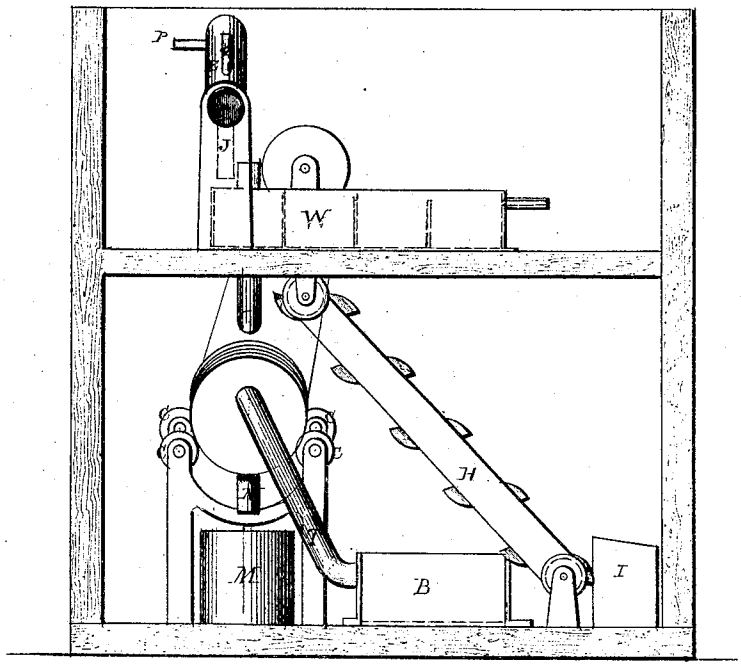
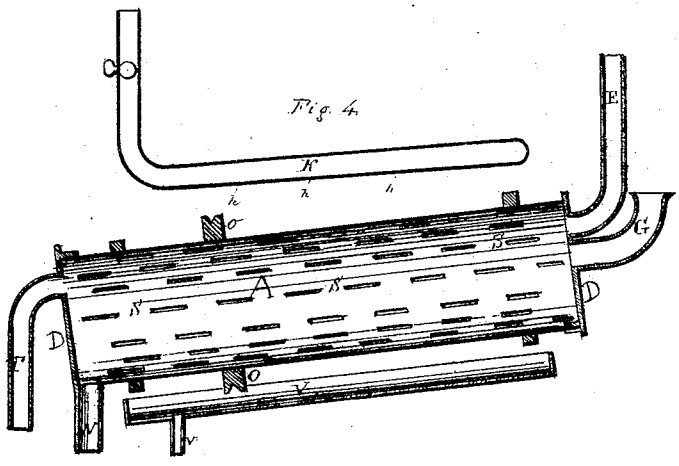


Fig. 4.



Witnesses
W. W. Swan
H. Farnam Smith

Gustavus A. Jasper

United States Patent Office.

GUSTAVUS A. JASPER, OF CHARLESTOWN, MASSACHUSETTS.

Letters Patent No. 101,019, *dated March* 22, 1870.

IMPROVED APPARATUS FOR COOLING AND SAVING CHARCOAL.

The Schedule referred to in these Letters Patent and making part of the same.

Know all men by these presents:

That I, GUSTAVUS A. JASPER, an alien, now residing in Charlestown, in the State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Cooling and Saving Charcoal, of which the following is a full and correct description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus.

Figure 2 is an end view.

Figure 3 is a view from the opposite end.

Figure 4 is a vertical section of the cylinder, showing the internal shelves.

These improvements relate to that description of apparatus in which the charcoal is cooled by forcing a current of air through it while agitated by the revolution of a cylinder through which it is passing, or while otherwise in motion through a cooling-chamber; and consists in devices for rendering the current of air colder for withdrawing heat from the cylinder or chamber, and for collecting and saving the charcoal-dust.

The invention consists also in various details of construction, hereinafter particularly set forth.

I proceed to describe the apparatus, including the improvements, as put into successful operation by me.

A is a revolving cylinder made of boiler-iron, twenty feet in length and four feet in diameter, mounted, as shown in the drawings, upon friction-rollers C, so that one end is lower than the other, and furnished with internal shelves S, about two inches deep, as shown.

The heads of the cylinders D D do not revolve. They are supported by iron bands, which are secured to the top of the room, but which are not represented in the drawings.

Motion is given to the cylinder by a chain running in the grooved ring O, rigidly attached to the cylinder and over a pulley on the main shaft X.

B is an ice-chest, open at the top and connected with the cylinder through the lower fixed head, D, by the pipe or air-passage T.

E is a flue leading from the upper head of the cylinder, in which, at F, there is a fan to create a strong draught of air through the ice-chest and cylinder.

G is a tunnel, through which the hot coal is introduced into the cylinder.

The hot coal is thrown from the wagons upon the platform I, whence it is hoisted to the tunnel by the endless chain of buckets, H.

The revolution of the cylinder and the shelves causes the charcoal to pass slowly from the upper end of the cylinder to the other, whence it is discharged through the tunnel N into a proper receptacle, M. During its passage through the cylinder the charcoal is cooled by the action of the air first drawn through the ice-chest to make it cold, and then through the cylinder.

K is a water-pipe communicating with a cistern.

Along the bottom of the pipe, over the cylinder, there are small holes, *h h h*, through which streams of water are constantly discharged upon the cylinder, to draw from the cylinder the heat imparted to it by the hot charcoal within.

The water is caught in a trough, V, placed under the cylinder, as shown. The trough is supported by the frames holding the friction-rollers. It has an outlet, *v*.

Above the fan for about twenty-five feet the flue has a nearly horizontal direction, inclining downward slightly, as shown.

Opening into this portion of the flue are two small pipes, one a water-pipe, P, and the other a steam-pipe, Q. The steam-pipe has an elbow within the flue, as shown, and discharges a jet of steam to meet the current of air produced by the fan. The steam and the current of air meeting, the dust contained in the latter is whirled or drops into the water, which has entered from the pipe P and is flowing along the bottom of the flue. This stream of water passes out through a discharge-pipe, J, carrying with it all the charcoal-dust within a cistern W. The current of air finally overpowers the steam, and both are discharged together into the open air through the mouth of the flue, which is above or beyond the steam-pipe, but both air and steam are free from dust. The water introduced into the flue through the pipe P catches and carries off dust independently of the steam; and a jet of steam introduced as above, without the water, will collect upon the bottom of the flue considerable dust, but in the latter case it is necessary to frequently clean out the flue.

The cistern W has a series of partitions, each partition being a little less in height than the preceding. The coarser charcoal-dust falls to the bottom of the first compartment; the next coarser to the bottom of the next, and so on till the water flowing out from the last leaves therein the finest of the dust.

The advantages derived from the use of the ice-chest and the water-pipe K, as above described, cannot be overestimated. Before these improvements were added to the apparatus the cylinder, after a short use, become so heated that so much of the cooling-power of the air was spent in cooling the cylinder, instead of the charcoal, as to render it necessary to stop operations; and it was often necessary to send the charcoal through the cylinder more than once, or to use more than one cooling apparatus. With these improvements, however, the apparatus may be kept in constant use. Coal entering the cylinder just short of a red heat has, upon coming out, only ninety degrees of heat. One cooler will do all the work of a sugar-house of eighty tons per day capacity.

The fan in the flue takes its motion from a pulley on the main shaft. Fans in flues or in pipes for creating a draught have heretofore had one of the journals supported within the flue. This journal was oiled with difficulty, and the oil caught dust passing through the flue; or, where hot air was to be drawn through

the flue, the journal became so heated that the fan ceased to operate. By making two elbows in the flue, as shown at F, I am able to place the supports of both journals without the flue, and avoid these difficulties.

I claim—

1. Cooling the current of air which is to be drawn through the cylinder or cooling-chamber, by first drawing it through an ice-chest, substantially as described, for the purpose specified.

2. Cooling the revolving cylinder by water, substanstantially as described, for the purpose specified.

3. Turning the stream of water from the pipe P into the flue to carry off dust, substantially as described.

4. Directing the jet of steam against the current of air in the flue, substantially as described, for the purpose specified.

5. The combination of the water-pipe P and the steam-pipe Q with the flue E, substantially as described, for the purpose specified.

6. Supporting both journals of the fan outside the flue, substantially as described, for the purpose specified.

The above specification of my said invention signed and witnessed at Boston this 16th day of September, 1869.

Witnesses: GUSTAVUS A. JASPER.

W. W. SWAN,

H. FARNAM SMITH.