

IMPROVED ATTACHMENT FOR INJECTORS.

Injectors of almost any form are liable to uncertainty of action, after becoming heated; as, for example, when, after a stoppage, steam is let on to start the apparatus before it has cooled. There are other conditions, the inventor of the device below states, under which an injector is also likely to fail, and thus to imperil the boiler; but all such difficulties, he considers, are effectually avoided by the novel attachment represented in the illustration.

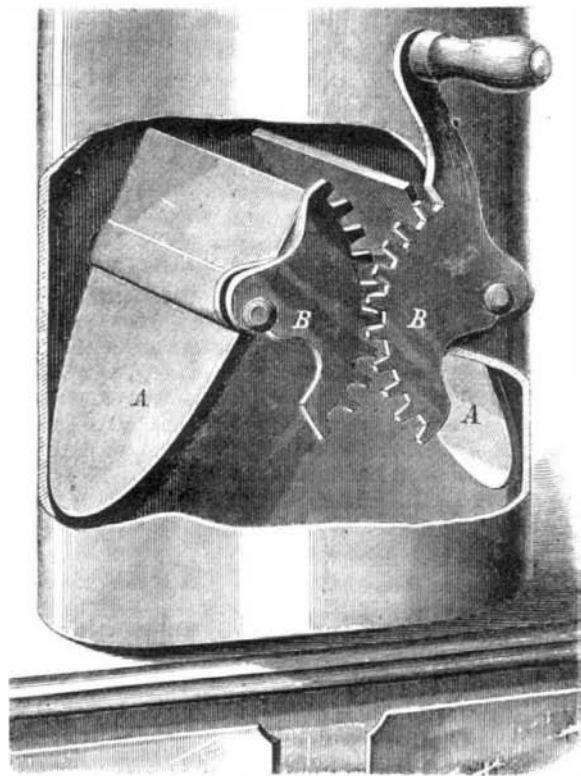
The apparatus is to be attached in the discharge pipe and between the nozzle of any injector and the boiler, and it consists of a lateral tube, A, introduced between the nozzle and a check valve, B, to the pipe which leads to the boiler. In the tube, A, sectional view, Fig. 1, is placed a valve, C, the stem of which passes through guides, and which is held open by a spiral spring when the steam is shut off, and the pressure thus removed. On the admission of steam, and as soon as the pressure of the same becomes greater than the power of the spring, the valve, C, closes. The steam, being thus prevented from escaping, opens the check valve, B, and passes into the boiler. The object of the check valve, placed between the overflow and boiler, is to shut off the boiler pressure from the overflow. If desired, the spring on valve, C, can be dispensed with and the same worked by hand.

A perspective view of the device is represented in Fig. 2. It requires no skill for its operation, as it is entirely automatic. With any injector, we are informed, it will lift hot water or feed under pressure. It is also claimed to obviate entirely the use of the pump. The simplicity of the invention is obvious, and its practical efficiency, it is stated, has been thoroughly proven by experience. It is now in successful use at the works of the Lehigh Zinc Company, Bethlehem, Pa., the Bethlehem Iron Works, Coleraine Iron Works, Redington, Pa., and in various other localities.

Patented through the Scientific American Patent Agency, February 9, 1875. For further particulars address the inventor, Mr. David Lees, or S. C. Stewart, Tyrone Forges, Blair county, Pa.

STEWART'S IMPROVED STOVE DAMPER.

From the engraving of the device herewith presented, it will be observed that the means used for closing more or less the interior of the pipe consists in double plates, instead of the single plate commonly employed. The double in-



clines thus formed, it is claimed, oppose the draft with less abruptness than the single plate damper, and besides may be more tightly closed than the latter.

The two plates, A, are pivoted separately, and are arranged so that they meet and close in the middle for shutting the damper. The pivots are geared together outside the pipe by segmental wheels, B, so that both are worked simultaneously by the same handle. When partially open, the plates incline upward toward the middle opening in a way which facilitates the draft, by directing it to the center of the pipe.

Patented April 6, 1875, through the Scientific American Patent Agency, to Dr. Jacob Stewart, of Moline, Rock Island county, Ill., who may be addressed for further particulars.

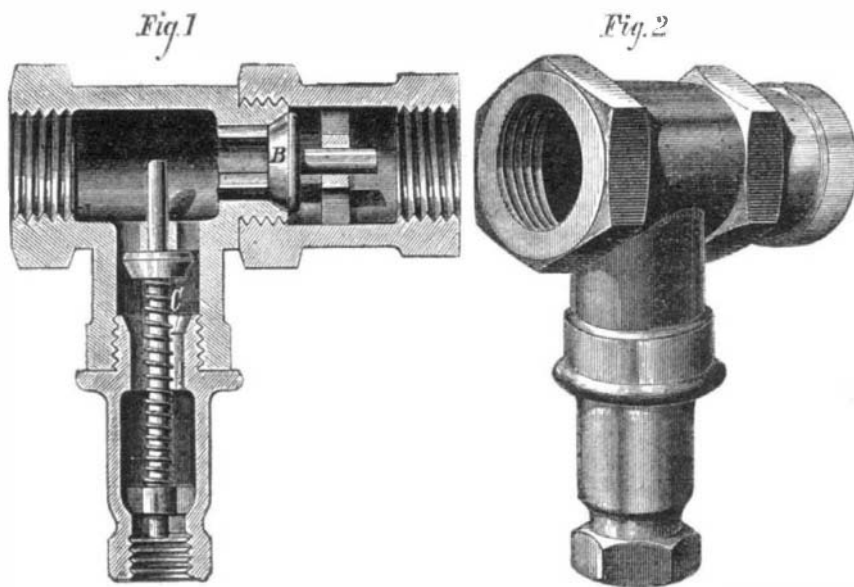
Amalgamation of Battery Zincs.

The simplest and quickest method is that of M. Berjot (a chemist at Caen), which consists in immersing the zinc in a liquid composed of nitrate of mercury and hydrochloric acid. A few moments is sufficient for the complete amalgamation of the zinc, however soiled its surface may be. With a quart of this liquid, which costs less than 50 cents, 150

zincs can be amalgamated. The liquid should be prepared in this manner:—Dissolve in warm water 200 grains of mercury in 1,000 grains of aqua regia (nitric acid one part, hydrochloric acid three parts). When the mercury is dissolved, add 1000 grains of hydrochloric acid.

The Galvanic Battery.

In regard to the economical application of electricity, no subject is so important as the relative merits of different forms of batteries. For illuminating purposes and lecture demonstration, we have hitherto had to rely upon the Bunsen or Grove battery. But, during the siege of Paris, a form of bichromate of potash battery, known as the Chutaux battery, was frequently employed to yield the electric light used on the ramparts. Count Moncel gives a full account of



LEES' ATTACHMENT TO INJECTORS

different forms of the Chutaux battery, and furnishes some interesting data for the comparison of the Chutaux and Bunsen battery when giving the electric light. The following results were obtained from the two batteries, each being composed of 48 cells, and each working for two hours:

BUNSEN'S BATTERY.			
At beginning.	Light equal to	End.	Mean.
100	66		87.5
Carcel lamps.			
			Surface of zinc employed.
			318.61 square inches.

CHUTAUX BATTERY.			
At beginning.	Light equal to	End.	Mean.
132	63		97.5
Carcel lamps.			
			Surface of zinc employed.
			92.88 square inches.

In working each of these batteries, for half an hour successively, the following results were found:

	BUNSEN.		CHUTAUX.	
	Light equal to	Carcel lamps.	Light equal to	Carcel lamps.
1st period of half an hour.....	109	109	132	132
2nd period of half an hour....	134	134	128	128
3rd period of half an hour....	106	106	80	80
4th period of half an hour....	66	66	51	51

According to these figures, the bichromate of potash battery flags much quicker than the nitric acid battery, a fact which evidently depends on the polarisation of its plates, to which it is always liable. It is, however, more economical.

One rather important advantage of these batteries is that they can be kept in a closed place without giving out any odor or unhealthy emanation; besides this, the liquid evaporates slowly. The author had also been able to verify the statement that, after a battery had been charged for more than a year, and then left alone, it had hardly lost anything of its power. The relative consumption of zinc and acid, and the comparative cost of working of the whole battery, are not given; but so far as the foregoing data are concerned, the Chutaux evidently promises extremely well. So says the *Telegraphic Journal*. For lecture purposes, an electric light is rarely wanted for more than half an hour, the great desideratum being a rapid means of charging and discharging the battery. In this respect nothing could be better than the Chutaux; being a single fluid battery, the plates can be raised and lowered easily and rapidly. One of the characteristics of this bichromate battery is the constant percolation of fresh solution through the battery; by this means a good deal of the bad effect of polarisation is got rid of. Here is the composition of the solution for his batteries, recommended by M. Chutaux: Water, 1,500 grains; bichromate of potash, 100 grains; bisulphate of mercury, 50 grains; sulphuric acid, 200 grains. The electromotive force of such a cell is at first more than twice that of a Daniell cell, but in duration it cannot, of course, be favorably compared

The cost of working the Chutaux, Count du Moncel finds to be about 35 cents, which he states is less than that of a Daniell cell, the advantage being that in the Chutaux an electromotive force of nearly double is obtained, and an internal resistance less than half that of the Daniell, besides other obvious advantages noticeable in the working of the two forms. A battery of 24 Chutaux cells, according to our author, can furnish a rarely brilliant electric light at a cost of about 15 cents per hour. If this be the case, the Chutaux

battery will rapidly come into use for the purposes of lecture demonstration.

The Lightning Rod Man.

He drove his team close up to the fence, got down, and rapped at the door. The widow Gilkens opened it, when he said: "Mrs. Gilkens, I am cognizant of the circumstances by which you are at present surrounded, left as you are to trudge down the journey of life through a cold and heartless world—no longer sustained and encouraged by the noble one to whom you gave the treasures of your heart's affection, and bowed down by the manifold cares and responsibilities incidental to the rearing of eight small children on forty acres of sub-carboniferous limestone land; yet, Mrs. Gilkens, you are aware that the season is now approaching when dark, dismal, dangerous clouds at frequent intervals, span the canopy of heaven; and when zigzag streaks of electricity dart promiscuously hither and thither, rendering this habitation unsafe for yourself and those dear little ones; hence, therefore, let me sell you a copper wire, silver tipped, and highly magnetic lightning rod."

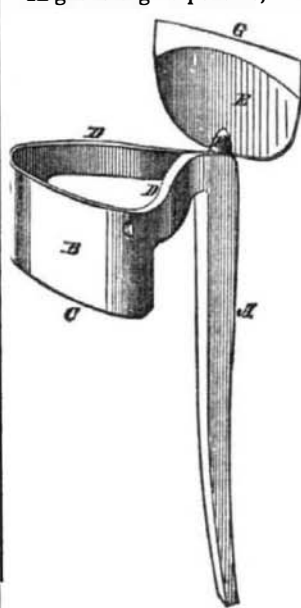
The woman staggered back a few paces and yelled: "Narcis! no fasten old Cronch!" In another instant a savage bulldog came darting round the corner of the house with bristles up, thirsting for gore. The dog had already mangled a machine agent and a patent soap man, and was held in great esteem by the better class of citizens for his courage and service; but when his eye met the hard, penetrating gaze of Mr. Parsons, his chops fell, and he slinked off and hid in the currant bushes. Then the man said: "My dear lady, you seem to be a little excited. Now, if you will allow me to explain the probably inestimable—"

"Dern ye, I know what will start ye," said Mrs. Gilkens, as she reached under some bed clothing, and brought forth a horse pistol; but owing to the shattered condition of her nerves, her aim was unsteady, and the charge of buckshot missed save where a few scattered ones struck his cheek and glanced off. A hard metallic smile spread over his countenance, as he leaned his shoulders against the door frame, and again commenced: "My dear madam, such spasmodic manifestations of your disinclination to make a judicious investment of a few paltry dollars—"

"Hi—eo!" shrieked the widow, and collapsed into a kind of jerking swoon, and before she had recovered a highly magnetic lightning rod decorated her humble domicile, and Parsons had the blank note filled out already for her signature.—*Madison (Ind.) Courier.*

IMPROVED TURPENTINE TOOL.

In gathering turpentine, it is necessary to have a tool for



scraping the tree downwards, and one for pushing upwards. Mr. Walter Watson, of Fayetteville, N. C., has recently patented, through the Scientific American Patent Agency, an implement which combines the two appliances, as shown in the engraving. The shank, A, is to be inserted into a handle of any convenient length. B is the scraper, the edge, C, of which is sharp. The arms, D D, are made so strong that the pressure on the edge, C, may not deflect them from the horizontal position. The blade, E, has a sharp edge at G, and is attached to the shank, A, by the enlargement, F. By using one or the other of

these blades, any globules of resinous matter which exude from the bark of the tree can readily be detached.

Steam Transportation on the Canals.

As soon as the Erie canal opens, the Baxter Steam Canal Boat Company will resume operations with twelve boats, each having a carrying capacity of about 225 tons. Contracts have been made for the construction of six additional boats, which are expected to be ready for use in July. When these boats are built, it is the purpose of the Company to send one from this city daily. It is believed that fifteen days will be the average time consumed by each boat in making the trip from New York to Buffalo and return, not including the time occupied in loading. Improvements have been made in construction by which space is gained fore and aft, but no attempt has been made to secure greater speed. As the canal is occupied by boats drawn by horses, the steamers must run carefully to avoid collisions.

The following method is used in Germany for the preservation of wood: Mix 40 parts chalk, 50 resin, 4 linseed oil, melting them together in an iron pot; then add one part of native oxide of copper and afterward 1 part of sulphuric acid. Apply with a brush. When dry, this varnish is as hard as stone.