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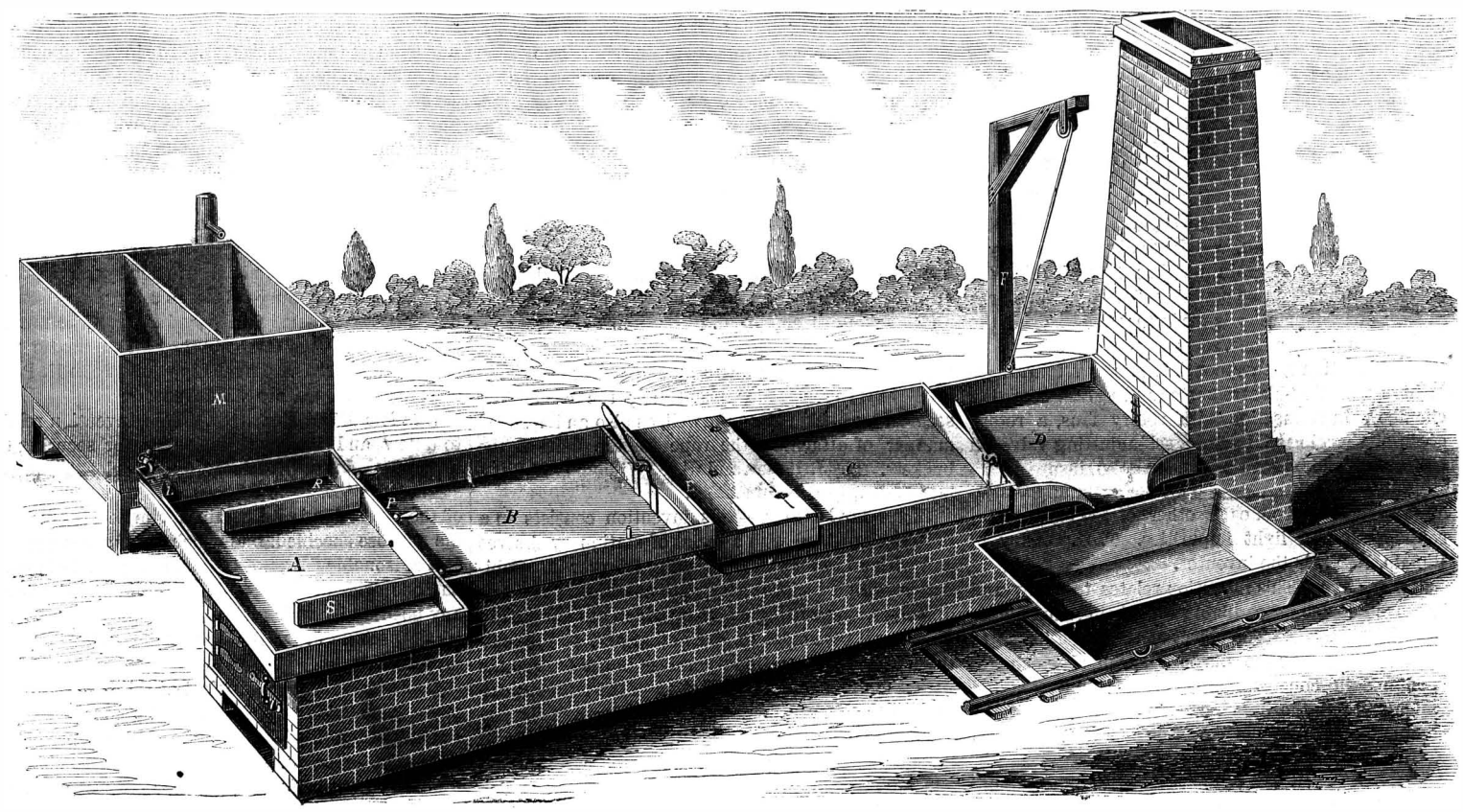
Improved Sorghum Evaporator.

The inventor of the sugar evaporator published herewith claims that he has succeeded in producing an apparatus which accomplishes the manufacture of sugar from the sorghum cane in the most perfect manner. By it all impurities are quickly and effectually removed, with but little labor, and the harsh vegetable taste, peculiar to the sorghum sugar, entirely removed. The finishing-pan is so constructed as to allow the syrup to be perfectly evaporated without burning the sugar, and facilities are afforded for its subsequent removal from the fire, by dumping it into a cooler. This evaporator is also economical in fuel and labor. Appended is the inventor's description of the apparatus and its operation:—



STEWART'S SORGHUM EVAPORATOR.

The plan and mode of this apparatus is represented in the engraving. It consists of four sections or divisions, A, B, C, D. The first three are stationary, while the fourth, D, is movable upon a horizontal axis. The divisions are made of sheet copper or iron, and when of the last-mentioned material have wooden sides. They are shallow and flat, and placed in a descending range, the pan, A, being the highest in the series. From the rear of the pan, A, two abutments or ledges S S, extend along its bottom for about two-thirds of its length, toward the front. The pan, A, projects over the sides and front of the furnace wall, and the abutments are so placed as to stand directly over the inner face of the side walls, and terminate just over the end wall of the furnace. That portion of this pan, therefore, which is situated between the abutments is exposed to the full heat of the fire, while the remainder is comparatively cool. This arrangement effects a complete separation of the scum, in the following manner:—The cane juice is received from the mill through a pipe into the tank, M, where it is prepared for clarification by first neutralizing it and then treating it with a small quantity of new defecating substance. From a compartment of the tank, M, the juice is then admitted to the head of the pan, A, through the conduit, L, in a continuous stream—the quantity received from the tank being always duly regulated by the rapidity with which it is heated, defecated, and finally discharged through the adjustable gate, G, into the next division or pan, B. The bed of juice in the pan, A, should be kept at a uniform depth of about one inch, and it will be kept in constant and rapid ebullition over all the central space between the abutments. The surface of the boiling liquid through this space is consequently much elevated, while toward the front of the pan, and within the bays or recesses, R R, at the sides, it is not heated. A surface current is created, which carries the scum forward and down into the receptacles, R R, where it lodges, and as it cools it becomes densely compacted and displaces any unclarified juice that may have collected at the commencement of the operation. The gates, P P, the openings of which are protected by wire gauze, afford a convenient exit into B, at the close of the day's boiling, for any clarified juice which may subsequently have been thrown into the bays when they were not packed with scum. Ordinarily the gates, P P, should be kept shut. At convenient intervals of time (once every half hour or hour, according to the size of the pan,) the dense mass of scum in the bays is lifted out by means of a large square flat dipper or shovel, with a perforated bottom, of such width as to slide closely inside the bays. At the same time that the scum is being separated and carried forward an undercurrent of cold juice is continually passing forward, and rapidly becoming heated. At a certain point as it advances it is thrown into ebullition, where it parts company with the scum, and impelled onward by the colder current behind it, escapes by the gate, G, into the next division, B. In B the juice is evaporated to a density of about 20° Beaume, by a thermometer kept immersed in the boiling juice at the back part of this division. A sliding gate or register, easily adjusted, both regulates the concentration to the required degree in this compartment and the discharge of the sirup from it into E, a shallow cistern, containing animal charcoal prepared expressly for this purpose. Through this filter the hot sirup passes into C, the third compartment of the series. The effect of this filtration is the removal of all the impurities which hinder crystallization, and of the peculiar flavor of unrefined sorghum sirup. A sirup so prepared is strictly a *refined sirup* of the first quality At this stage the sirup is clear, and unsurpassed in color and flavor. To preserve these qualities unimpaired to the close of the operation the subsequent evaporation must be rapid, and the sirup must instantly be removed from the fire when the proper degree of concentration is reached. The pan, C, in connection with the finishing pan, D, fully accomplishes these ends. After being reduced by boiling in C the sirup is passed through a gate, at intervals, into D. This pan is shallow, with a long beak or lip, and may be easily turned upon its axis by means of a lever, or cord and pulley, as at F, and successive batches of sirup upon arriving at the proper point of density, are dumped into a large shallow tank or cooler at the side of the range.

When the pan, D, is tipped to discharge the concentrated sirup a damper is drawn which shuts off the flame until the pan is replaced and a fesh portion of sirup admitted. Parties interested in the manufacture of sorghum sugar will do well to examine into the merits of this evaporation.

This invention was patented through the Scientific American Patent Agency on January 5th, 1864. For further information address the patentee, F. L. Stewart, Murraysville; Westmoreland County, Pa.