

Flexible Photographic Plates.

Photographers, both amateur and professional, have long wanted some thoroughly efficient substitute for glass as a support for dry plate films, and a few attempts have been made to supply the want with more or less of success. The following method has been recently patented in this country on behalf of Messrs. Fickeissen and Becker, of Villingen, Baden. The plates or surfaces can be prepared from paper, cloth, or other suitable fabric or material, but by preference from white paper containing very little size and not much grain. This paper is first extended on a frame or other arrangement, according to the size of the plate or surface which is desired. After it is dry the surface is covered in any convenient manner with a fine varnish or composition, such as copal varnish, for the purpose of rendering the fabric transparent; it is then dried, and after it is quite dry the surface is rendered smooth by the application of powdered pumice stone or other suitable material, or it may be smoothed by suitable machinery.

This process of smoothing may be repeated, if necessary, two or three times until the surface or plate is smooth or transparent. The surface so prepared is then covered on one or both sides with a solution of gelatine, isinglass, or other substance possessing similar properties, and allowed to dry. The surface so prepared may, if desired, be further treated with a preparation of ox gall from which the fatty matter has been extracted by acetate of alumina or similar acting agents, which will precipitate the fat of the gall, the resulting preparation being then passed through a filter, whereby a clear solution will be obtained with which the plate or surface may be covered, so as to secure the safe reception of the emulsion for photographic or other use. Instead of ox gall, any similarly acting substance or material may be used.

The plates or sheets prepared as above may be used with great advantage in reproducing photographs from nature in lines or stipples for calico and other printing, as the stipples or lines can be printed first on the material before it is made transparent. Any photographic design or drawing can be put on the transparent surface in the usual way, and by using the film as a negative or positive in photographing from nature or from a drawing, half tones will be reproduced in lines and stipples available for any kind of printing. As these plates or sheets are waterproof, they can also be used as surfaces upon which can be printed or produced all kinds of ornamental and useful work.

Porpoise Fishing on the Atlantic Coast.

The *Public Ledger* states the result of the first effort this season to entrap porpoises off the coast of North Carolina. It resulted in the capture of 75 fat porpoises, which were taken to Philadelphia to be "tried out." The estimated weight of the catch is 45,000 pounds, from which Capt. John A. Cook, superintendent of the company, roughly calculates will be procured 1,000 gallons of oil, 3,750 pounds of leather, and 15 tons of phosphate. The hide will make a leather pronounced equal to the best French calf skin, and the oil is said to be superior to sperm oil. Leather from this source has been made in small quantities for some years in England and Germany; it is fine and strong, and makes the best shoe laces.

The fishing, it is said, will be continued, but as the weather is getting warm it is probable that the next catch will be "tried out" at an establishment on the coast. It is intended to fish in Chesapeake Bay, and about June 1 operations will commence at Cape May, and continue during the summer. The net used is something like what is known as a "fyke" net, and is, with the wings, a mile long. The bag into which the fish are inveigled is 60 feet wide, 24 feet deep, and 120 feet long. The 75 fish were caught in two hauls, the first bringing in 39, both hauls being made in one day.

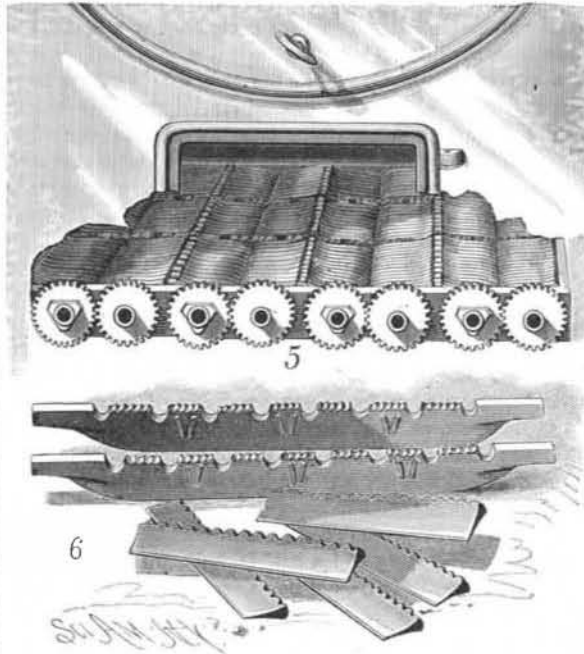
Water from Eucalyptus Roots.

In many parts of Australia, where water is scarce, the natives formerly procured it from the roots of the eucalyptus and a few other trees. The tree most preferred throws out numerous lateral roots, which lie at a depth of from six to twelve inches below the surface.

According to a writer in the *Proc. Linn. Soc. of New South Wales* (vol. viii., 1883), the native having ascertained, by means of prodding with a pointed stick or spear, the position of some of the roots, "removes the superincumbent soil with his wooden shovel for twenty or thirty feet, and cutting the root off at each end lifts it out of the trench and cuts it up into lengths of about eighteen inches or two feet, knocks off the bark, and stands the several portions on end in some receptacle to contain the water. . . . As soon as these pieces are placed on end, the water commences to drip, and when the whole of the root or roots are cut up and placed on end, the native, beginning at the first placed, puts the end in his mouth and by a vigorous puff expels the remaining water. . . . The water is beautifully clear, cool, and free from any unpleasant taste or smell."—*J. F. J., Amer. Nat.*

IMPROVED FURNACE GRATE.

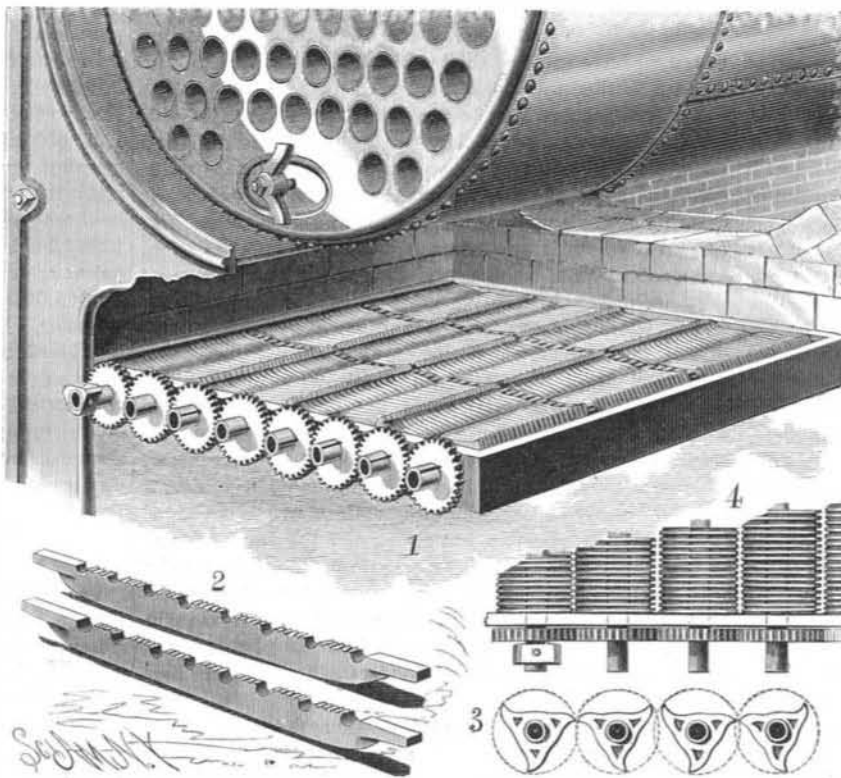
The accompanying illustrations represent a new and effective method of removing the refuse—ashes, clinkers, slate, and all foreign and incombustible matter—from the fire chambers under boilers, forges, furnaces, etc. This invention has been patented by Col. J. A. Price, of Scranton, Pa., and is a direct result of an intimate acquaintance with the problem in all its aspects, and of long continued study of the mechanical details. The grate insures complete combustion by reason of an absolutely clean fire bed, and reduces



PRICE'S IMPROVED FURNACE GRATE.

the waste arising from unconsumed fuel to a minimum, beside saving both time and labor in cleaning.

The grate consists of tubular shafts connected by gearing, and having mounted thereon a series of cutting fire arms or bars which operate in pairs when the grate is constructed as shown in Fig. 5, and together when made as in Fig. 1. The action is positive, and any foreign substance lying upon the grate is cut up and discharged. The cutting arms are slipped upon the tube, which is either ribbed or grooved to meet a corresponding groove or rib in the cutting arm, thus fastening all into a rigid mass capable of making a cut of any length up to ten or twelve feet. Fig. 2 represents cross bars, whose ends rest upon the sides, which serve as carriers. Fig. 6 shows the form of cross bars used when the cutting arms are arranged in pairs; the same figure shows the dividing bars, which divide each pair of arms and which are supported by lugs upon the sides of the cross bars. Fig. 3 is a vertical cross section, and Fig. 4 a plan view of the grate. The shoulder on the cutting arm constitutes the



PRICE'S IMPROVED FURNACE GRATE.

spacing of the bars, which may be larger for coarse and finer for small fuel, and so on down to culm, or coal waste.

The tubular shafts are open at each end, and the natural passage of the cold air from the outside to the high temperature of the inside, into which they discharge under the burning surface, serves to preserve them from the action of the fire; they are further protected by the cutting arms slipped upon them. These tubes can be converted into water bars by the use of socket joints without interfering with the action of the grate in the least. A simple lever turns one pair or all, or an adjustable clutch can be arranged to connect with some moving part of the engine, thereby doing

away with the labor of the engineer or fireman. The fire can be effectively cleaned without opening the door; steam will not run down during the operation, and the boilers will not suffer in consequence of the expansion and contraction caused by the frequent opening of the doors. This fact will be appreciated by locomotive engineers. A light or thin fire bed, free from clinker bridging, can always be maintained. Culm, coal waste, or dust can be taken direct from the deposit and used, no preparation being needed.

What the Elevator Has Done.

The marvelous advance in the construction of business and residence dwellings in New York and other large capitals of the world is clearly due to the use of the elevator. The substitution of steam for human strength in lifting people from the ground to the upper floors of structures has radically changed not only the appearance of the streets, but our methods of living and doing business. Fifteen years ago these great business and apartment edifices were unknown. The possibilities of the elevator were only then beginning to be understood. But what a change has occurred in our leading business streets! Without the elevator we would have been deprived of every striking structure in New York. There would have been no Equitable, Mutual Life, Mills, Western Union, Temple Court, Morse, Field, Boreel, or Tribune building, and then there are literally hundreds of apartment houses which would not have been erected had it not been for this very simple means of "getting up stairs."

Of course high buildings have their disadvantages. They imperil human life, if not incombustible. They exclude light and air from neighboring houses, and then they are manifestly out of place on narrow streets. But notwithstanding these drawbacks, the building of these great establishments will be continued. The average builder and householder is opposed to them, and cordially seconds the bill now before the Legislature to put a stop to their construction. They are, however, so comfortable, convenient, and profitable that no law can stand, even if enacted, limiting their height. New York is designed to become a city of monster buildings, and no legislation will avail against the inevitable.

The public, however, has a right to demand that these high structures shall be fireproof, and that there shall be ground or courts about them, so that they cannot interfere with neighboring property. The rule should be, at least 40 per cent of vacant space wherever a high building is erected. The limit now demanded by law is too small. Life and property should be protected, but beyond that there should be no interference with capitalists who wish to invest in this latest outcome of business and domestic architecture.—*Real Estate Record.*

How to Prevent an Epidemic of Small Pox.

The metropolis is again threatened with an epidemic of small pox. The disease, which broke out some weeks ago in the northeastern district, is now prevalent in Hackney and one or two adjoining parishes, and the number of cases under treatment in the Asylum Board Hospitals has risen from 150 in the middle of March to 273 on April 7. The frequent occurrence of outbreaks of small pox in London, and the great expense entailed by treating and isolating the cases in hospitals, make us ask the question: Can an epidemic of small pox be prevented? It is a well known fact that a very large proportion (75 per cent being the average) of those nowadays attacked with small pox have been vaccinated in infancy, but that after a time the protection against small pox afforded by vaccination seems to die out.

We have before us statistics of 17,756 cases of vaccinated small pox cases of all ages, treated in the London hospitals from 1871 to 1881. Of these 15,903, or 90 per cent, were over 10 years of age, while only 10 per cent were under 10 years. This shows in a sufficiently definite manner that, of the vaccinated population, children under 10 years are very little liable to small pox, and that the incidence of small pox is in those who have passed the age of childhood, and are entering on or have reached adult life. To afford protection against small pox to adults in the same measure as we now do to children by vaccination in infancy, is clearly the only effective means (apart from isolation in hospital or at home) of preventing epidemics of small pox; and, to effect this, a second vaccination should be performed soon before or at the age of puberty. We have frequently instanced the experience of small pox hospitals, where the staff there employed are revaccinated, to show the complete immunity from small pox enjoyed after revaccination by those engaged in nursing the sick. If the public would protect itself against small pox in the same way that officials of small pox hospitals do, this loathsome and dangerous disease would never assume the proportions we have been accustomed to see during the past fifteen years. To prevent an epidemic of small pox, we unhesitatingly say that the only effective measure is revaccination.—*British Medical Journal.*