IMPROVED GALVANIC BATTERY.

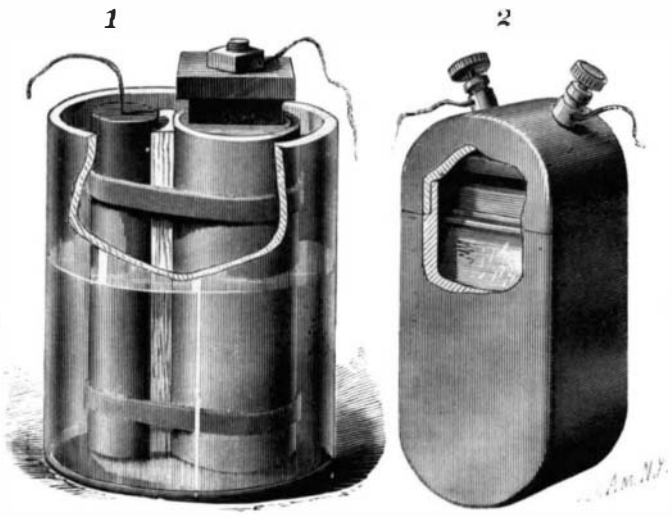
The improvement illustrated herewith is designed to effect the rapid and complete depolarization of the negative plate, and thereby increase the efficiency of this class of batteries.

In this galvanic battery the positive plate is made of zinc, in any of the well-known shapes, and is provided with a wire conductor connected with it in the ordinary way. The negative plate, which is of carbon, is placed in a porous cell and surrounded with a mixture of granulated gas retort carbon, granulated black oxide of manganese, and mild chloride of mercury, or calomel, equal parts. These materials are intimately mixed together with a small quantity of water before being placed around the negative plate. As the fluids of this battery, when in operation, are very corrosive, the upper end of the carbon is saturated with paraffine or wax, and the electrical connection is made with it by casting lead or solder around it, and attaching to it a binding screw. The porous cell is filled around the carbon to within a short distance of the top of the cell with the mixture of gas carbon, black oxide of manganese, and chloride of mercury, and the top of the cell is sealed with a cement of resin and wax, or any other insulating cement insoluble in the fluid of the battery. Two small holes are left in the cement for the admission of water or the exciting fluid, or for the escape of gas which may be generated in the porous cell.

The porous cell, containing the carbon plate, the granulated carbon, and black oxide of manganese, and the chloride of mercury, as above described, is placed in a suitable jar, together with a zinc rod or plate which has been amalgamated. The exciting fluid is a saturated solution of ammonium chloride or sal ammoniac. The action of this battery is as follows: The zinc, calomel, carbon, and manganese being all insoluble in water, there is no internal action when the circuit is open. The circuit being closed, decomposition commences. The zinc is oxidized by the water of the sal ammoniac solution forming oxide. This zinc oxide immediately reacts with the sal ammoniac (ammonium chloride), first combining with a portion of the chlorine of the latter (and displacing an equivalent of ammonia), and then combining with another portion of the sal ammoniac, forming ammonia zinc chloride, while the ammoniac becomes converted into ammonia. The hydrogen being liberated at the negative plate, unites with its equivalent of oxygen from the peroxide of manganese, reducing this to the sesquioxide, and by this union forming water. The ammonia reduces the calomel into metallic mercury and hydrochloric acid, which latter unites with the ammonia, forming ammonium chloride, to be decomposed, as above described, or this latter acid may act directly upon the zinc, thereby intensifying the action of the battery.

The reaction given above may not be at all times fully complete, and the double chlorides of zinc and ammonia may be formed, as well as double chlorides of mercury and ammonia; but the above shows the advantage of the use of the calomel, as by its use the ammonia, which previously was a waste product in this class of batteries, is made to play a part in intensifying the action of the battery, and render it practically a constant battery, fitted for any use where a constant current is required, as well as having it still a very desirable and economical form of battery, for use with alarms or bells, or other forms of work where open circuit is the rule and closed circuit the exception, as in telephone service.

Fig. 2 shows a portable form of the battery in which the mixture of carbon, black oxide of manganese, and chloride of mercury is inclosed in a canvas rack placed between zinc plates which are wrapped in blotting paper. The inclosing case is made of rubber or other suitable material. The exciting fluid is a saturated solution of chloride of ammonium, which is absorbed by the blotting paper surrounding the zincs and by the canvas sack and its contents. As this form of the battery contains no free solution, it may be carried in the pocket without inconvenience. Further information in regard to this invention may be obtained by addressing C. D. Parkhurst, Fort McKinney, Wyo., *via* Rock Creek.



PARKHURST'S GALVANIC BATTERY.

Dairy Industry in France.

To give an idea of the dairy industry in France, M. Herve Mangon recently stated at an agricultural gathering that the milk produced in the country would, if collected, form a stream about 1 meter in width and 33 centimeters in depth (say 3 ft. 4 in. and 1 ft. 1 in.), flowing night and day all the year, with a mean velocity of one meter per second. Young animals drink a part of this enormous volume of milk, man takes a good part of it, and the rest is transformed into cheese and butter. No branch of agricultural industry has so progressed during the last fifty years as the making of butter. In 1833, France bought abroad 1,200,000 kilogrammes of butter, and sold to foreigners only 1,100,000 kilogrammes. She now exports 34 to 35 million kilogrammes of butter annually, and receives in return from abroad (especially from England) a sum of more than 100 million francs.—*Nature.*

Furniture Manufacture.

The value of our annual furniture product has increased sixfold in the past thirty years, approaching the magnificent total of $120,000,000.

During the past ten years, says the *Furniture Gazette*, the main growth has been in the Western States, various causes combining to move the centers of production from their long established seat in Eastern cities. The main causes operating to bring about this result are: the shifting of the centers of population, the great demand incident to the newly settled and prosperous West, and the location of the lumber supply. These causes have exerted different degrees of influence, so that while some branches of furniture manufacture in the East have been almost annihilated by Western competition, others have prospered, suffering only a partial curtailment of their Western trade. The former class is made up of those manufactures requiring much lumber, while chairs, upholstered furniture, etc., have suffered very little by the growth of manufactories of those articles in the West. In the East the cities, as a rule, show but little growth, New York, Boston, and Philadelphia being either stationary or showing a falling off from 1870, but this is owing, doubtless, to high rate of taxation, as in the rural districts of New York, Massachusetts, and in some of the municipalities, as Brooklyn, there is a fair increase.

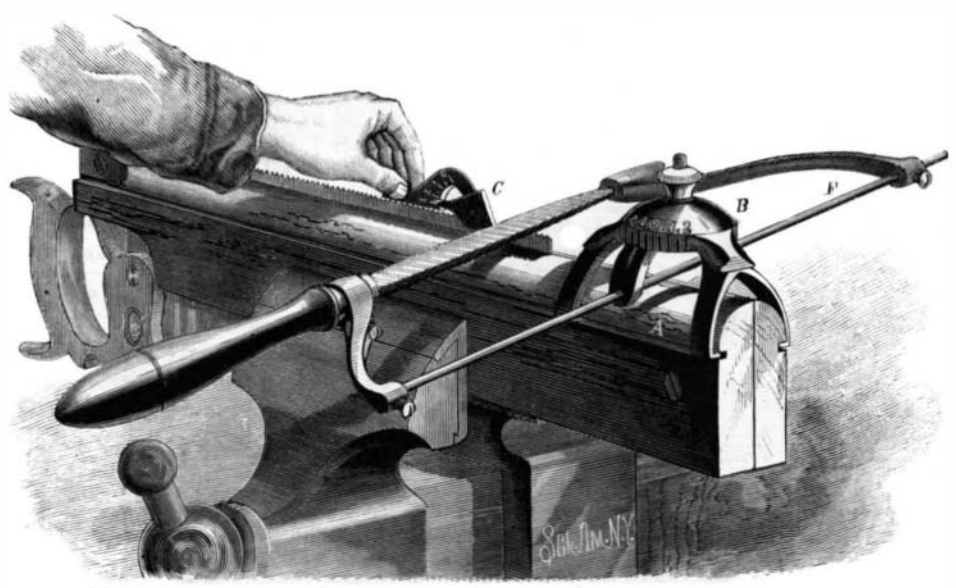
SAW FILING MACHINE.

The engraving represents an improved saw filing machine recently patented by Mr. Elias Roth, of New Oxford, Pa. This machine guides and adjusts the file so that the teeth of the saw on which it is used will all be filed to a uniform pitch and size, and will be made level. The apparatus is very simple indeed, and is easily applied and operated.

A A are the clamps between which the saw is placed and held as usual. These clamps are formed each with a longitudinal groove in the side.

B is a clamp for carrying the file frame, which consists of a head provided with legs to slide in the grooves in the clamps. A, so that the clamp, B, may slide freely lengthwise of the saw. At the under side of the plate is a semicircular or arc-shaped piece, held in place by a screw and thumb nut, the screw passing through a slot in the lower piece, so as to allow of its lateral and vertical adjustment. The ends of the lower piece are apertured, receiving the slide rod, F, of the file frame. This file frame is formed by arms upon the ends of the rod, F, the arms being adjustable and formed at their outer ends to receive the ends of the file. The file being held in the frame in this manner, and the guide rod, F, being held in the clamp, B, the file is free to be moved endwise and across the teeth of the saw, and the file may also be swung upward from the saw teeth upon the rod, F, as a center. By setting the piece which guides the rod, F, to the right or left, the angle of the file with reference to the teeth is varied. This is important, because all saws have their teeth set or bent, one to the right and the other to the left; and in order to file teeth so that their cutting edges shall be in the proper direction, the file must be set to the left while filing one-half of the teeth, and to the right for filing the other side. These changes can be readily made by loosening the thumb nut upon the clamp, B; and to facilitate the accurate adjustment of the file the plate is provided on its upper side with a scale of figures to indicate the angle.

The pitch given to the teeth is of course dependent upon the angle of the filing surface to a vertical line. This is varied by adjustment of the file in the file frame. To facilitate this adjustment and insure accuracy, a gauge, C, is provided. This gauge consists in a plate formed with a straight edge to rest upon the points of the saw teeth, and to the plate is pivoted a pointer. By turning the pivoted plate the angle of the edge is varied with reference to the straight edge of the plate, and upon the plate there is a scale of numbers to facilitate accurate adjustment. The gauge, C, being placed upon the saw teeth, and the pointer properly adjusted, the file is to be adjusted to correspond with the edge of the plate, which will give the proper pitch to the teeth. This may be done with either a three-cornered, a flat, or a half-round file, the file being secured in the frame by a set screw.



ROTH'S SAW FILE GUIDE.

Inventors and Patents.

Judged by what seems to be current opinion, it would be inferred that the failures of inventors, at least of those who secure their inventions through the operation of the patent laws, were phenomenal. Why of all men who invest means—sometimes foolishly—the inventor in a patent should be singled out to point a moral is a matter by no means plain. Unquestionably, if all patents issued from the Patent Office are looked upon as evidences of so many attempts to establish a business enterprise on the basis of their existence, a large proportion of failures to get rich can be chronicled, but even then hardly more than could be found in other business enterprises. If the same argument that is applied so flippantly to the patentee's affairs is applied in the same way to general business affairs, the scope of the inquiry into the cause of the lack of success will be widened to an extent apparently not thought of.

But it is manifestly unfair to look at best upon more than a very small per cent of the total number of patents issued as evidence of an intention to establish a business or accumulate a fortune by their means. The great majority of patentees risk the small amount necessary to obtain a patent exactly as they risk similar amounts in other side or collateral issues, that is, for the chance of getting back more than they invest, and fully comprehending the probability of failure. Looked at in this light, the failures are about as numerous in one instance as in the other, but in one case they go upon record, while in the other they are unknown. A good many men can look back to a few dollars invested—sunk—in the Patent Office, and at the same time can contemplate several other enterprises that were balanced by profit and loss. It is sometimes noted as remarkable that so many who know substantially nothing of the matter at issue attempt to improve existing appliances, and undoubtedly a large per cent of the failure of patented devices to come to the surface the second time is due to this cause; but why this should be considered more remarkable than the fact that men are forever meddling with other things with which lack of acquaintance makes success at least highly improbable, no one can tell.

If in distinction from those who invest a little in patents in the way of their regular business, or who do a little in that way as a sort of side issue, the class that may be termed professional inventors be taken in comparison with those engaged in other business affairs, it will be found that both classes are subject to the same general laws of business, and about the same ratio and degree of success and failure will appear.

Individual judgment is likely to be at fault, or one is likely to invest unadvisedly in securing a patent exactly as in a hundred other ways, and the results will be in accordance with the quality of the judgment; but the idea that there is anything phenomenal in the failure of inventors is something for which it would be difficult to find any foundation.—*The American Machinist.*

James Laughlin, Sr.

James Laughlin, Sr., President of the First National Bank of Pittsburg, and member of the firm of Jones & Laughlin, iron manufacturers, died in that city, December 18. For many years Mr. Laughlin had been identified with the iron industry of Pittsburg.