

### THE WAY BANKS EVADE THE USURY LAWS.

The banks have a plan so simple and effectual for evading the usury laws that it is not probable that they would give one cent to have these laws repealed. When the market rate of interest is 14 per cent a year, the plan is for a merchant to get notes discounted at 7 per cent for double the amount of money that he wants, the whole to be carried to his credit, on condition that he is to draw out but half of it; thus if he gets \$5,000 from the bank he pays interest on \$10,000.

The way the bank manages to have its customers leave a portion of the money carried to their credit, is this. Several merchants offer notes at the bank for discount, and when they call to know whether the directors have decided to take the notes and pay the money for them (after taking out the interest), one merchant finds that his paper has been discounted while the offerings of another have been declined. The unsuccessful applicant calls on the cashier and asks him:—

"Mr. Chandler, why was not my paper done to-day; were not the names satisfactory?"

The cashier replies, "The directors found no fault with the names, Mr. Smith, but we had applications for all of our funds from firms whose accounts were better than yours, and we felt bound to give them the preference."

By the "accounts being better" is meant that these firms have larger sums to the credit of their accounts, on which they are paying interest, but which they have left with the bank to be loaned to somebody else, thus enabling the bank to get double interest on its funds.

Most merchants living in cities expect, when they hire money, to pay the market rate of interest, but the obstruction of the usury laws works a serious inconvenience to borrowers, especially when dealing with banks, as they can use only a portion of their receivables, having to leave a portion with the banks merely for the purpose of evading the usury laws.

We never knew a usury law in any community which was not systematically and generally evaded; and the inconvenience and expense of the evasions always fall upon the borrower.

### The Fifteen-Inch Gun.

We have received from the publisher, D. Van Nostrand, 192 Broadway, a very neatly printed little volume, entitled "Notes on Sea-Coast Defense," by Major J. G. Barnard, U. S. Corps of Engineers, the object of which seems to be to defend the United States system of harbor fortification from attacks in various quarters, and especially from some remarks made by Sir Howard Douglas in his famous work on naval gunnery.

Major Barnard claims a superiority in the embrasures or openings, through which the cannon are discharged, of the American sea-coast forts over those generally found in European fortifications. The latter flare from the inner face of the wall outward, while the embrasure designed by General Totten in 1815, and built in our forts previous to 1852, has the narrowest portion within two feet of the outer face of the wall, thus diminishing very considerably the area of the external opening. In 1852, General Totten made a still further improvement, which consists in lining the embrasure with wrought-iron plates, 8 inches in thickness, and in some improvements in form rendered possible by the employment of the new material. They have an external opening of 3 $\frac{2}{10}$  sq. feet, while that of embrasures found in most European fortifications ranges from 40 to 50 square feet. Sir Howard Douglas, as he says, "after a careful perusal" of General Totten's report, condemns the plan in toto, pronouncing it the very worst possible combination of materials for such a purpose, and states that the United States War Department have declined to carry it into effect. Major Barnard, in reply, says that General Totten's report contains a statement that his plan had been approved by the Secretary of War; and he further says that more than 500 embrasures, in accordance with this plan, have been built within the last five years into our fortifications now in process of construction.

Major Barnard says also that the United States engineers have been constantly endeavoring to construct cannon of extraordinary caliber, as a part of our system of sea-coast defence; it being well known that a

missile of large weight moving at a moderate velocity has a far greater smashing effect than one of small weight moving at high velocity. A bullet fired from a pistol will make a clean hole through a plate of glass, while the same bullet thrown from the hand will break the glass in pieces.

The practical limit to casting very large guns in a solid mass resulted from the property of iron by which it shrinks in cooling. As the outside cools first, it forms a rigid band which will not yield inward, and as the metal inside cools and shrinks, it forms a porous mass of little strength which rapidly wears away in service. But Captain D. J. Rodman, of the ordnance corps, contrived a plan for casting cannon hollow, and cooling them from the inside, by having a stream of water circulating through the core. As the inner portions around the bore cool first, when the outer portions cool they find nothing to prevent them from shrinking, and thus the whole mass comes together in an unusually solid condition.

After casting several guns of smaller caliber by this method and finding that it succeeded according to his anticipations, Capt. Rodman undertook the casting of a gun of 15-inch bore, and this was successfully effected at the Fort Pitt foundry of Messrs. Knapp, Rudd & Co., Pittsburg, as has already been mentioned in our columns. This cannon is 15 feet and 10 inches in length, with an external diameter of 2 feet and 1 inch at the muzzle and 4 feet at the breech, and it weighs 49,100 lbs. Major Barnard says that, up to the present date, it has been subjected to 350 rounds with full charges, and that at the three-hundredth round, the delicate tests applied to the bore failed to indicate the slightest enlargement or deterioration of any kind. The average charge has been 35 lbs. of large grained powder with shells of 305 to 335 lbs. weight. The solid shot would weigh 425 lbs. The range, accuracy, &c., were entirely satisfactory. Major Barnard thinks that no iron-plated ships would be able to bear the crushing effect of these ponderous missiles.

### Patent Extensions Before Congress.

Mr. BIGLER, from the Committee on Patents and the Patent Office, to whom was referred the petition of Samuel F. B. Morse, for an extension of his patent for the electro-magnetic telegraph, submitted a report, accompanied by a bill, to extend a patent heretofore granted to Samuel F. B. Morse, which was read and passed to a second reading.

He also, from the same committee, to whom was referred the petition of John G. Mini, praying for an extension for his patent, asked to be discharged from its further consideration, which was agreed to.

He also, from the same committee, to whom was referred the petition of Solomon Whipple, praying for an extension of his patent for a machine for cutting files, asked to be discharged from its further consideration, which was agreed to.

He also, from the same committee, to whom was referred the petition of Samuel Colt, praying for an extension of his patent for an improvement in fire-arms, asked to be discharged from its further consideration, which was agreed to.

He also, from the same committee, to whom was referred the memorial of a committee appointed by certain employes of the Patent Office, praying compensation for their services from April 1, 1860, at the rate fixed by law, asked to be discharged from its further consideration, which was agreed to.

### Patents in the Southern Confederacy.

The following resolution passed the Southern Congress on the 4th of March:

*Resolved*, by the Congress of the Confederate States of America, That all persons, being citizens of the Confederate States, who may wish to procure patents or file caveats for inventions and useful discoveries and improvements, may file in the office of the Attorney General a specification of such invention, discovery or improvement, together with such descriptive drawings as may be necessary; and such specification, when so filed, shall operate as a caveat to protect the rights of such persons until regular application can be made according to law; and this resolution shall apply to all patents heretofore granted by the United States to citizens of this Confederacy, and to caveats heretofore filed by such citizens in the Patent Office of the United States on such patents, and copies of such caveats being deposited, as aforesaid, in the office of the Attorney General; *Provided*, That such applicants shall pay such fees as may hereafter be required by law establishing a Patent Office, on application for patents and filing of caveats.

The above resolution is merely declaratory, and does not fully indicate what the settled policy of the Confederate States will be respecting patents.

It will be observed, however, that all persons, being citizens of those States, may take out patents and file caveats, but applicants for such privileges are not required to make oath that they are the inventors of the object for which protection is sought. This indicates a free-and-easy system, and one which affords no security to the honest inventor against a wholesale appropriation of his rights. The resolution also squints at ignoring the rights of all patentees protected by the Federal Government, except citizens of the Confederate States.

### Coal Fields of Massachusetts.

A memorial has been addressed to the Legislature of Massachusetts by Professor Thomas S. Ridgway relative to the coal fields of that State, setting forth the causes which have hindered their development. These carbonaceous deposits extend from East Bridgewater to Seekonk river, and from Foxborough and Mansfield to Mount Hope Bay, embracing the townships of Seekonk, Attleborough, Pawtucket, Mansfield, Norton, Raynham, Taunton, Dighton, Rehoboth, Swansea, Somerset, Berkley, and parts of Easton, West Bridgewater, Middleborough and Wrentham.

The greatest difficulty that presents itself to a practical miner, says Professor Ridgway, in searching for a workable bed of coal in this coal field, is owing to the fact that nearly the whole of the coal deposit is covered up to the depth of from twenty to seventy feet with sand, gravel, pebbles and boulders, well known amongst geologists by the name of "drift formation," concealing effectually not only the outcroppings of beds of coal that may exist, but all traces of their locality. The exact position of the deposits is therefore wholly a matter of conjecture, and a dozen test holes of moderate depth may be sunk without striking a lead of coal. The only mode of ascertaining with certainty whether there is a workable bed of coal, is to sink test holes in the center of the coal fields, by boring through the drift of sand, pebbles, &c., to the coal strata, and then to drill down to the lowest part of the coal measures. All attempts at mining for coal in this State have been along the edge of the formation, where the drift covering is moderate in depth. Pits that yielded quite largely of good coal have been opened, but the coal seams being thin and twisted, and a lack of capital preventing the pits from being sunk down through the whole of the coal strata to the thickest beds of coal below, the enterprises were abandoned.

Professor Ridgway believes that there are workable beds of good coal, of a merchantable character, to be found at a considerable depth, in the Massachusetts coal field, and proposes that the State shall defray the expenses of boring to discover the same. The cost of boring one hole, 370 feet deep, he estimates at \$3,590; but, having once started, eight holes may be bored for \$4,990. In some of the Pennsylvania coal fields the pits have to be sunk from 400 to 900 feet deep. Coal which has been mined at Mansfield is nearly equal to the Pennsylvania anthracite.

DECEASE OF A SCIENTIFIC PHYSICIAN.—Sir William Burnett, the discoverer of the method of heating timber, called Burnettizing, died in England on the 18th ult., at the advanced age of 82 years. He was a physician by profession, and served principally in the British navy. His scientific attainments were considerable; he was knighted as a mark of distinction for his services, and he was a fellow of the Royal Society. His process of heating timber to preserve it, consisted in forcing a solution of the chloride of zinc into its pores, by pressure, in close cylinders. This process was carried on a few years since, upon a somewhat extensive scale at Lowell, Mass.

THE effect of the use of tea has been much discussed. Professor Johnstone, a good authority, has asserted that it prevents the waste of the body, and nourishes it. Dr. Smith, in a lecture recently delivered before the Society of Arts, maintained that tea was good only in helping our digestion of fat or farinaceous food, and thus far was nourishing; but if the tissues are wasted by exertions or too profuse perspirations, tea is injurious. It does not suit a spare habit, or much exertion, or low temperatures, or a defective skin. These opinions are not generally held.

AMONG the many products obtained from coal are chloroform and very pure spirits.