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Contents:

(Illustrations are indicated by an asterisk.)

IRON PLATES NOT INVULNERABLE.

On another page we republish from the London *Times* a full description of the complete destruction of a most massive iron-plated target by a 600-pound shot. This result will be regarded by the ordnance officers of our army as a confirmation of the soundness of the views which they have been urging for many years. **The charge was 40 pounds of powder** and the shot struck the target with a velocity 840 feet a second. Our officers have long been contending for very heavy shot at moderate velocities in preference to lighter shot at higher velocities. Major Barnard, in his "Notes on Sea-coast Defense," presents the case thus—the italics are his own:—

"A leaden bullet fired from a pistol will penetrate a pane of glass by a clean round hole; the same thrown by the hand will *smash* it to fragments. To *damage* a vessel seriously it is not the hole-puncturing property which we need, it is *the smashing* effect, *the staving-in* of planking and timbers; or, if a hole alone is made, that it shall be so large as to defy plugging. Of course, it is the larger projectile *only* that can make the large hole; and all experience (as well as theory) tells us that, for *smashing* effects, large *masses* with moderate *velocities* are the most efficient."

Again he says:—

"When these iron-clad ships come to 'engage, at breaching distance, our earth or stone forts,' and to have their 'laugh' at them, we do not try to *punch* holes in them; we wish to stave in the whole side. For this purpose masses of *large diameter* moving with *moderate velocity* are indispensable. The 15-inch shell would probably be effectual against the in-inclined-sided battery, and would be likely to convert Captain Cole's cupolas into *shooting-caps* indeed. Penetrating and exploding in an iron-clad or wooden vessel, a single one would probably suffice.

"Fifteen inches is the caliber of the gun made as an experiment to test the practicability of casting guns of extraordinary caliber, and their efficiency. The result has convinced our ordnance officers that it is not an extreme limit. A 20-inch gun can probably be made, and not only *made* but *used* with facility and efficiency. Enormous and expensive as they are, such guns may have their 'mission,' and a few of them in our important sea-coast batteries will probably be hereafter deemed an essential part of their armament."

On the other hand, the ablest of the English journals have argued that the effect of a given quantity of powder would be equally destructive whether behind heavy or light shot. This striking experiment in England is confirmatory of the conclusions from experiments with heavy shot in this country.

It is possible that the turrets of the *Dictator* and *Puritan* would resist even the 600-pound shot fired at the velocity of 840 feet per second, though it would undoubtedly go through the sides of either of these vessels. And what effects it would have on the turrets if fired with 80 pounds of powder we cannot tell. Even with 40 pounds it would probably penetrate the turrets of the small monitors, or shatter them to pieces.

PEACHES.

The peach crop has proved this year to be a most abundant one, and it is literally retailed by thousands of bushels all over the city. Carts perambulate the highways and byways loaded so that the springs touch, and almost every urchin has his pockets full. Business men go hurrying along with their hands full of peaches, and the monotonous cry of the vender is heard from morn till sultry eve—a dewy eve is unknown at present in this locality. The price is remarkably low considering the state of the currency, good fruit being sold for fifteen cents per quart, or twenty-five cents for two quarts. When we reflect that New York is but one city, and that there are other large ones—Baltimore, Philadelphia, Albany, and Boston—where the papers assure us the fruit is also abundant, we can form no estimate of the peach crop of 1864.

Of course peaches preserved in the ordinary way with sugar, pound for pound, are not to be thought of now, and they are neither good nor wholesome when they are so made—a thick, heavy, indigestible and tasteless conserve being produced. The proper way to preserve this delicious fruit is in small jars with very little sugar. Our readers may have seen small glass barrel-shaped mustard pots. These are just the things for the purpose in the absence of air-tight jars, which are beyond the means of some. The glass mustard pots could be had in ordinary times for three cents each, and can now be sold for at most six cents, cork and all. The way to preserve **peaches in them is as follows:—Peel them nicely,** split them in half and take out the stones; split each half again and put one-fourth of a pound of sugar to each pound of fruit, even less than this will do—as the fruit is naturally sweet it may be kept without any sugar whatever. It is safest however to use a little. Scald the peaches, but do not boil them, then take a table-spoon and put each quarter in the mustard pots, which must have previously been placed in a kettle of water and allowed to heat gradually to the boiling point. After the quarters are all in, fill up the crevices with juice, to within one-fourth of an inch of the top and continue the boiling under the pots when the contents will rise. Scalding the peaches drives the air out of the quarters and the boiling subsequently perfects this process, so that in about thirty minutes the corks can be put in. The corks should be soaked in hot water which makes them soft and easily compressed, and they must be driven in tight. The juice will be displaced at the top and overflow, but it must be wiped off and the pots taken one by one and dipped instantly in a pot of resin and beeswax, or tallow, which closes all the pores in the cork and makes it absolutely air-tight. The cement should be made just so as to be tough, not brittle; it is easily tried by dipping a little in cold water.

Three pounds of peaches cost now about twenty-five cents, stoned and peeled. The sugar for this amount would cost twenty-four cents; the sirup will increase the weight nearly one pound, and even at present prices we shall have four pounds of delicious sweetmeats at a cost of twelve cents per pound. Dried peaches cost at all times thirty cents per pound; next winter they will be dearer still. Which is the cheapest—dried peaches or "peaches in juice," as the French call them?

ONE of the Kindergartens, in Boston, has adopted the system of graduating the school hours to the age and advancement of the pupils, and the results have been most favorable. The youngest children come only from 9 to 12 A. M., those next them come one hour in the afternoon also, and the oldest two hours.

CAN WE FLY BY STEAM?

If we could make a machine the power of which should bear as large proportion to the weight as the muscular power of a bird does to its weight, we could fly. It would be interesting to know how nearly we can come in the present state of the arts to making such a machine.

The London *Engineer* says that large locomotives weighing 35 tuns, have been worked up to 1000-horsepower—less than eighty pounds to a horsepower. If a small steam engine could be made as light in proportion to its power, we should have a practical flying machine. Great progress has been made within a few years in the construction of light steam engines for fire-engines, and the *Engineer* describes one weighing 35 cwt. that gave 35 indicated horsepower. So it seems an engine of 35-horse power has been made nearly as light in proportion to its power as the 1000-horsepower engine.

But in order to fly we want an engine weighing only 200 or 300 pounds, and yet as powerful, or nearly so, in proportion to its weight as the large engine mentioned above. If an engine of 2-horsepower could be constructed to weigh only 300 pounds, with its water, and a little fuel, it would raise its own weight 220 feet in a minute, drawing itself up by a pulley over a rigid support. If by beating the air it would raise itself twenty feet in a minute, or would raise itself at all, it would fly.

How much power would have to be expended in beating the air in order to raise a given weight we have not the data for determining; but it is probable that some of our readers could easily ascertain. The form of wings for a flying machine is indicated with great certainty by our present knowledge. It is that of a light spiral fan, and there must be two fans to each machine to prevent the machine from turning instead of the fan. Now, if some of our readers who have the proper tools will make a fan, like a spiral windmill, and will measure its thrust when driven by a given power, they will settle this branch of the inquiry. Perhaps the simplest plan for making this measurement would be to fix the blades of the fan to a hollow sleeve, which could slide along the shaft on which it was supported. Let the sleeve be long enough for a cord several feet in length to be wound upon it, and then a heavy weight attached to the end of the cord will turn the fan. By weighing the weight and measuring the time of its descent, the power consumed in driving the fan will be ascertained. The force of the thrust may be measured by holding the sleeve from sliding along the shaft by means of a spring balance. By employing different weights the thrust at various velocities might be measured.

Some of our boiler-makers can doubtless tell us how light the boiler for a 2-horsepower engine can be made. To carry water enough for half an hour's running will be sufficient, or evenfor fifteen minmtes. If we can once accomplish the great feat of flying we may trust to further improvements for the power of traveling greater distances, and in fifteen minutes we might go fifteen miles. If an iron boiler and engine is not more than three times too heavy, by the substitution of aluminum the weight of metal would be reduced to one-third, and the thing would be done.

It may be that no small steam engine can be constructed with a tenth part of the power in proportion to the weight requisite for a flying machine, and it may prove that even this familar motor in its present condition comes nearer the power to fly than any of us have supposed. At all events, it will be interesting to know how near we are in the present state of the arts to the possession of this enchanting power, and we hope some of our readers will take sufficient interest in the subject to give us the several facts, when we will put them together.

RED SEALING WAX of good quality is made by carefully fusing a mixture of 48 parts of shellac, 19 of Venice turpentine, and one of Peru balsam, to which 32 parts of finely levigated cinnabar and some sulphate of lime are afterwards added. In the cheaper kinds red lead is substituted for the vermilion, and there is much common rosin, which causes the wax to run into thin drops when melted. Black sealing wax is made of 60 parts of shellac, 10 of Venice turpentine, and 8 of finely levigated ivory-black.