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CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK Row, and not at No 39.

THE SEWING-MACHINE MANUFACTURE—WHAT IT HAS ACCOMPLISHED.

To attempt any adequate notice of the benefits the invention of the sewing machine has showered upon mankind at large would require volumes. The struggles of Howe, who for years battled against poverty, prejudice, and interested opposition, and of Singer, Wilson, and others, whose inventions were coldly received for a long time, have had their rich reward, not only in pecuniary success, but also in a recognition of their merits by the whole civilized world. But this is not the object of the present article; it is mainly to refer to the benefits conferred upon mechanics and on the public by the improvement in tools and in methods of doing work, and also in awakening a more general interest in machinery.

The castings for sewing machines must be very light, very smooth, and very perfect. Some of the delicate parts will compare favorably with the fine Berlin work so much admired for ornamental purposes. These requisites have necessitated great improvement in the skill of the molder and in the accuracy of the pattern maker. In regard to the molding, many parts which formerly were molded from halved patterns are now "coped," reducing the cost and increasing the durability of patterns, which are the most costly appliances used in casting. When these castings come from the pickling tank they are of wonderful smoothness and finish, and in working seldom show blow holes. In this respect the sewing machine manufacture has been of immense benefit to this department of the arts. The demand for perfect and finished castings was imperative, and the demand was met.

In the introduction of new processes of finishing and ornamenting, the invention of the sewing machine was a great boon. Electro-plating in gold and silver was previously an art seldom employed for purposes of utility; japanning was confined mainly to a coarse process used on tin ware; inlaying was generally done on articles of a purely ornamental character, by mechanically recessing the material to be ornamented and setting the foreign substance by hand in the recess. All this is changed. The chemist's laboratory has been, in part, transferred to the manufactory. Dealing with chemical compounds and practicing chemical processes have become familiar, to a certain extent, to our mechanics. This is an advantage to them and a benefit to the public. The beautiful finish on the castings of the sewing machine, a finish which resists oxidation, abrasion, and time, and is so superior to the paint and varnish formerly employed, is that of the japanning process demanded by the requirements of that ornament to the parlor and sitting-room, the sewing machine.

The artistic ornamentation of its parts by inlaying with mother-of-pearl and other iridescent materials has added another branch to the wide range of mechanical manipulation. By cementing these beautiful substances on the iron, and filling the interstices with a varnish which hardens like iron, all the effect and the durability of the old time inlaying is assured at a fraction of the cost.

Then in the perfect finish of those parts the surfaces of which are not covered with a layer of a more precious metal, or hidden by japan or ornamental shell, the sewing machine has been a great advantage to mechanics. The perfection of the forgings required, demanding the most cultivated skill; the invention of machinery to insure accuracy and multiply products; the absolute exactness demanded where hand labor is indispensable, all show the influence of the sewing machine

on the practical education of mechanics, and consequently on the advancement of mechanical art.

There is one other aspect of this subject worthy of notice. That is the introduction of the fairer sex to the beauties of machinery, making them interested in the subject. Sometimes in visiting manufactories in company with ladies we have been surprised that they evinced no interest in the machinery but only in the results of its operation. So on board one of our moving palaces, the River or Sound steamers, they were more interested in the upholstery and hangings of the cabin than in the workings of the powerful monster that propelled the floating hotel through the water. The sewing machine has changed all that. We have now female machinists, not those only who run sewing machines, but women who can direct and put together a machine; who can use screwdrivers, wrenches, and other mechanical tools, and ascertain a fault in the adjustment of the mechanism and remedy it. And, to tell the truth, they are not behind their fellow workmen of the other sex in their love for and adaptability to the work.

Here is an avenue opened to woman. She may even invade the province of the "greasy mechanic" without becoming "greasy," and, with her instinctive delicacy of touch and judgment, succeed where he would fail.

ENCOURAGEMENT TO MANUFACTURES—THE NEWEST MODE.

Public encouragement to manufactures is always eagerly conceded by those who find themselves directly interested in the increase of substantial prosperity around them—substantial or productive prosperity, as distinguished from mere activity in exchanges. To take a recent striking illustration: The city of Augusta voted a release of two years' taxes to the proposed Sprague corporation, beside aiding it with a quarter of a million of her bonds, and the citizens of Oxford, in the same state, have since voted ten years exemption to all manufacturing capital hereafter introduced in lots not less than \$10,000. In like manner those really interested in the growth and wealth of any place will always gladly pay a moderate indirect tax of any kind to encourage manufacturing industry at their own doors. There is no difference of opinion among practical men, of whatever political school, in a case thus brought home to themselves.

In all countries, tribute is gladly paid by other interests to the Arts that profit all: the kind of tribute varies in different cases, and that is all the difference. In England, it happened that the tribute took an opposite form to that rendered in this country: but free trade meant practically the same thing there that protection means here, namely, encouragement to the Arts. Agriculture, after a blind and bitter struggle indeed, gave up its protective tariff, that England might become, through cheap bread, the workshop of the world. Agriculture now knows that it has gained a hundred fold for what it gave up, and would no sooner resign manufactures for the sake of a close corn market, than a man would exchange his house for the lumber or the trees it was built from.

In America, on the other hand, we gladly agree—mere traders and theoretical economists excepted—to pay or risk paying a temporary tax on foreign manufactured goods, that the all-profiting Arts may become great among us. If that is not enough, through the effect of deranged currency and heavy taxation, then local interests band together and say to manufacturers, "we will pay your taxes, if you will come hither and build us up." This method of supplementing an insufficient national encouragement to manufactures, although placing the burden of a national benefit on the shoulders of a few, is yet so manifestly profitable even to the few, that we expect to see it extensively adopted, while the present difficulties of business enterprise continue. Thus much is certain: that in one way or another mankind must and will have the Arts, and no community will content itself in bucolic simplicity, after books and newspapers have opened its eyes to the prosperity of others and its causes. The question is between resting in a comparative barbarism, with few and primitive arts, accepting like savages all improvement at the hands of others; or on the other hand, placing ourselves among the foremost in all that advances humanity, and making the rest of the world debtors and dependents instead of ourselves. For we do not achieve progress by purchasing its fruits from others. Not consumption, but production, makes a people great: and gathering corn or gold from Nature is not production but only a form of consumption. There is no national greatness in mountains of gold or cotton or corn: it is only in the genius that can feed its workshops with these crudities and transform them into utilities; and to the hands of that genius they all must flow, no matter where they come from, just as all the rivers flow to the sea.

We remarked that the general impulses of self-interest are infallible; but we must qualify that with the proviso that the case must not be too complex for self-interest to comprehend itself. Within such limits the selfishness of all communities that want prosperity works in the same way, and is so far infallible—it craves and subsidizes willingly the aid of the Arts. Could selfishness be enlightened one step beyond its mere instinct, so far as to perceive that no class of arts or interests can flourish alone, but that all are allies, and their union multiplies the powers of each by the sum of all, then we might realize a consistent, harmonious public policy, fostering with a liberal hand every art that needs encouragement, in the assurance that every other interest must be ultimately enriched by paying tribute to a dominant principle of productive progress.

ALUM AND PLASTER OF PARIS, well mixed in water and used in the liquid state, forms a hard composition and is a useful cement.

IMPROVEMENT IN MECHANICS' TOOLS.

To the observant man whose attention has been directed to the immense advances toward the perfection of machinery made during the past twenty-five years, no step in this direction will strike him more forcibly than the improvements in tools. The machinist, for instance, who could have enjoyed a Rip Van Winkle sleep for a quarter of a century, and should now awake and essay to work at his trade in a well-appointed shop, would find himself as far behind the requirements of his business as when he first entered the shop as an apprentice. He would find the file, which in his day was the favorite tool, scarcely ever out of his hands, superseded by the planer, shaper, milling machine, turning tool, and many other devices which perform the work more accurately, quicker, and with much less expenditure of labor. The center punch, bench centers, and hammer have largely given place to the centering machine; the screw cutting and tapping machine does much of the work formerly performed with the hand screw plate and hand tap; the slotting machine cuts the key ways, and more perfect bench tools, as gages, try squares, straight edges, etc., assist in the manual labor.

Any other mechanical business will show a similar progress; indeed, there are few of the old tools except those which have been superseded by more modern appliances that have not been more or less modified and improved. Although all or nearly all these improved appliances are labor saving, yet the demand for skilled labor is fully as great as ever. Skill is required in the proper management of these tools as well as in their production. An inefficient and unpractised workman will as surely ruin a job in using the best and most approved tools as though he employed improper appliances, while by the aid of superior tools the good workman can turn out superior work.

MUTUAL ASSISTANCE AMONG MECHANICS.

In No. 17 current volume we published an engraving and description of a device which will prove valuable to many mechanics all over the country and possibly to some in other countries. It was a simple tool for drawing a wood screw the head of which had broken. Given by Mr. Lewis Garrigus, of Waterbury, Conn., a mechanic, to his fellow mechanics, it affords an illustration of the oneness of labor—the generous willingness of one mechanic to assist another. There is much more of this generosity exercised than is publicly known, but it seems as though there could be no adequate reason why more of it should not be known.

The time has gone by when every advance made by an individual mechanic should be made a secret, or if conjectured or its effects seen, be held as a mystery. There are many improvements made by practical workmen which cannot be the subjects of patents, and yet would be useful to the grand fraternity of workers, and through them beneficial to the world at large. Is it not the duty of the inventors in such a case to allow their improvements to be put to extended practical use by their publication? The benefits would be increased and the discoverer gratified by the publicity given to his improvement and the credit accorded to him, while if he selfishly concealed his knowledge, in many cases he would not be pecuniarily advantaged. "Art is long but life is fleeting." This the old Latins understood when they said: "*Ars longa, vita brevis*," and the neglect of the legitimate inference is the reason we now are compelled to speak of the "lost arts." This love of the possession of a useless secret, or rather of a secret whose usefulness is contracted, is gradually giving way to a more catholic and human spirit, and it is a promising sign of future progress in the arts.

DOGS VERSUS WOOL.

The wool product of this country is seriously discouraged, and quite shut off on many farms, in consequence of the multiplication of worthless and predatory dogs. The last Agricultural Report contains the returns of the number of sheep killed by dogs in the year 1866, made by the correspondents of the statistical division of the Bureau. The amounts foot up 130,427, from reports supposed to cover at most only about one fourth of the ground; allowing as a safe estimate, 500,000 sheep worth \$2,000,000, destroyed yearly by that invaluable pet, the dog. That this estimate is within the truth, may be seen from the number reported and paid for by law in Ohio, which amounted in five years to 203,324. The loss in New York has been estimated by the Secretary of the State Agricultural Society, at 50,000 in a year.

Unfortunately for the sheep, the dogs have votes, while the sheep have not. That is, the "representatives of the people" know that there are ten men who would be enraged by a dog tax and would govern their votes by no higher consideration, where there is one farmer who would allow a few dead sheep more or less to control his public duty. Of course it is only the more degenerate and mangy class of curs that enjoy the right of political citizenship, with the consequent civil right of killing their neighbors' sheep. Decent dogs pay their taxes cheerfully or change places if they cannot afford it, content themselves with such bones as they can honestly come by, and never aspire to dictate the votes of their masters and the policy of the government. But for "curs of low degree" this is a free country, where one dog's vote is as good as another's "and better too."

METER AND TESTING APPARATUS FOR DISTILLED SPIRITS.

The losses of the Internal Revenue Department of the Treasury by fraudulent returns from distillers, and the consequent seizure of distilleries and of spirits created a demand which would not be evaded for some automatically