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American Machines—A Remedy for England.

A strange fact relating to the increase of population in England is, that in the manufacturing districts it has been as thirty to one per centum, in comparison with that of the rural districts. It is therefore evident that the rural has been drained of their population to supply the manufacturing districts. This is "a great evil under the sun," as it has been the means of crowding the people into cities, and subjecting them to the numerous fluctuations which are the constant attendants of commercial life. The frequent outbreaks by the manufacturing population of England against their employers, do not excite any surprise in us; they are the natural results of a most pernicious system, which originated with the landed aristocracy many years ago. This was the destruction of the small farm system, and the buying up of small freeholds, to convert them into large and extensive "lease holdings." For many years this policy appeared to work well, but when we hear of 25,000 persons deprived of employment in the manufacturing town of Preston, England, out of a population of 69,000, as is now the case, and along with this, the sacking and plundering of the mill owners' houses, it is time that some attention was directed to remedy this evil. Intelligence will not make a starving people happy nor content, and wherever there is a population subject to frequent fluctuations in their pursuits of life, there, for a certainty, is to be found suffering and fierce discontent. What is the remedy? we answer, "more permanent employment." To obtain this, let the rural population be increased, and the landlords go back to the old small farm system of sixty and eighty acre leases, and rear up the lost virtuous peasantry of other days. A farmer with but a small capital cannot lease a large farm in England, because it requires no small amount of money to stock it with all the machinery and implements necessary to cultivate it properly; and a person with a small farm, unless he has all the required appliances to compete with one who has a large farm, must fail in the struggle of competition. It surely cannot be doubted that a farm of fifty acres can be cultivated as well and as profitably as one of 200 acres; but to do so with comparative economy, the small English farmer must have cheap and good machinery adapted to the circumstances and the work he has to perform. The remedy for him must come from America; our excellent and cheap portable thrashing and winnowing machines, grist mills, &c., and our superior hand implements, are the remedies we suggest for a return to the small lease-holding system.

When in Britain some years ago, a very intelligent farmer (to whom we had a letter of introduction from his son in this State) seeing that our attention was principally directed to his farming machinery and implements, asked our opinion of them, and was more than surprised when we answered that a Yankee farmer could make better hoe handles, scythe snaths, and rakes with his axe, than those which his workmen and women were using; we admitted that his wrought iron plows, with steel shod shears, also his harrows, and some other implements could not be surpassed, but we also assured him that Yankee plows could be furnished to do as good work, for one-fourth the price, and as for his threshing machinery, an American machine which might be wheeled on a barrow would do as much work in a day as his, which occupied a space not much less than a decent sized barn.

The triumphant success of the American reaping machines at the World's Fair in London, has aroused British agriculturists to a just sense of the value of American machinery; and the "London Times" notices with acclamation an American threshing machine, lately introduced by the celebrated Mr. Mechi, which it says does as much work as the best English ones of the same class, and cheerfully adds "it can be furnished for one third the price." This is good news, and not a little flattering to the

nest pride of our countrymen. As the World's Fair of 1851 was a republic of science and art, we trust its effects will never die; and we confidently hope that if our good political institutions cannot be engrafted upon that country, that American genius, as displayed in our agricultural machinery, may be the means of remedying the evils to which we have alluded.

Patent Office Report for 1852—No. 5.

EXAMINER LANE.—This examiner has charge of no less than 7 classes of instruments, machines and other articles, namely, "mathematical and philosophical instruments, lever and screw power machines, stone, clay, and glass manufactures, leather, household furniture, wearing apparel, and churns and implements for working butter." The examination of some kinds of household articles appear to be divided between Examiners Gale and Lane. We are informed in this Report that 437 cases were acted upon by this Examiner, but no mention is made of the number he passed, or the number rejected—a great oversight. Very good notices, however, are given of some of the inventions passed by him. The first is that of a new mode of killing whales, &c., by powerful electric discharges. The whaleboat is supplied with a powerful magneto-electric machine, constructed with large permanent magnets and rapidly revolving armatures surrounded with coils. One pole of this machine is connected by a thick wire with the copper sheathing on the bottom of the boat, thus establishing a large surface connection of that pole with the water of the sea. The other pole of the machine is connected with the harpoon by means of a gilded copper wire covered with a coating of india rubber. After the machine has been put in motion, the harpoon is thrown, and the instant it strikes the whale, the electric discharges of the machine take place in rapid succession from the harpoon head through the body, returning through the sea, (which forms part of the circuit) to the other pole of the machine. "Serious doubts," says the Report, "were entertained by the Patent Office of increasing the power of electric shocks to a sufficient degree to over-power such a large animal as a whale, yet we are informed that the experiments already made upon whales have been successful." Our doubts are not yet removed. A patent was granted for self winding up the register of the Morse telegraph; to it, an electro-magnet with an armature is applied, this operates a lever and pawl, which act upon a ratchet wheel that continually winds up the main spring for driving the clock work of the register. The extra electro-magnet is operated upon by the same current which actuates the recording instrument; provision is made to prevent over-winding up. One patent was granted for striking bells by electro magnetism. This patent was illustrated in Vol. 7, Scientific American, and constitutes the Boston Municipal Fire Alarm. A patent was also granted to the inventor of the electric fire alarm for an improvement in galvanic batteries; it consists in having only a section of the interior cup porous, instead of the whole of it, as was formerly the case. Two patents were granted for improvements on the points of lightning rods, having for their object the prevention of melting off the whole point by an electric discharge. The principle in both is the use of metallic alloys of different degrees of fusibility.

Bourdon's pressure gauge for steam boilers, &c., is briefly noticed. The principle of this gauge consists in having a metallic tube much flattened, then bent into a curve, which may amount to nearly a whole circle, one of the flattened sides forming the concave, and the other the convex side of the curve. The interior of this tube is made to communicate with the confined fluid, the pressure of which is to be measured. This pressure tends to force the flattened sides of the tube apart, and according to the amount of this action, the pressure of the steam is measured by a pointer connected with the tube by pinion and lever, which tells what the amount of pressure is in pounds, by pointing to figures on the face of a dial. If the interior of this tube is exhausted of its air and made a vacuum, it will become a barometer. We have seen one of these mechanical barometers, which was brought from

Paris, and cannot but speak in the warmest terms of its neatness and correctness; we certainly like it better than the mercury barometer.

A patent was granted for an alarm time-piece for lighting lamps. A spirit lamp and match are so arranged and combined with the works of a clock, that at the hour when the alarm of the clock is set to ignite the match, a hooked pawl is disengaged by the machinery, the match is rubbed and ignited, and then brought in contact with the wick of the lamp, which is thereby inflamed. This is a very convenient invention for persons who are obliged to get up from their slumbers at various hours during the night.

Parker's machine for pressing plug tobacco, on exhibition at the Crystal Palace, and which was illustrated on page 4, this volume of the Scientific American, is favorably noticed.

Eastman's stone dressing machine, illustrated on page 60, this volume, Scientific American, also on exhibition at the Crystal Palace, is very favorably noticed. The truth is, that if an improvement of any value at all, is made on a machine, that improvement is worth patenting, and those who think otherwise neither reason well nor wisely. We have not been able to notice all the important patents passed by this Examiner, but will complete the list in our next number. We have endeavored to present the nature and action of those we have noticed, in clear and intelligible language. We are confident that our remarks will be understood, and impart no small amount of useful and interesting information to many of our readers, who are unable to procure an official Report.

Leather and its Improvements.

Leather is an article of universal use; it is worn by the civilized and the savage, the high and the low, the rich and poor of all nations, from the icy regions of the North to the burning sands of the tropics. It was known and employed by man long before the first alphabet was invented,—the waters of the Deluge had rolled over the face of our planet,—the Tower of Babel was erected, or the foundations of the all enduring Pyramids were laid. Leather is an article of manufacture entirely, a compound substance, a chemical product; although it is made of the skins of animals, it is as different from the raw material as oil is from soap, which is one of its two ingredients. Skins are principally composed of gelatine, which is soluble in hot water, and is converted into glue by repeated steepings in warm water. Leather is simply the raw material combined with some other substance, which renders it elastic and insoluble in water. Various substances are employed to obtain this result, and different qualities of leather are produced by the different ingredients employed, and the modes of using them in its manufacture.

The process of manufacture is named Tanning, and the principal substance employed is tannic acid. This acid is found in various substances, but principally in the fruits and barks of certain trees and shrubs. Good upper leather should have the following qualities—elasticity, softness, and insolubility in water. Good sole leather should be close in the grain, firm but slightly elastic, and perfectly water-proof.

The tannic acid is extracted from barks, &c. by immersing them in water, hot or cold, and by simply steeping the hides in this tan liquor, the tanning leaves the water, combines with the gelatine of the skin chemically, and forms that useful compound substance which forms our *understandings*, and which we term "leather."

This is the theory of tanning, but in carrying it out into practice the manipulations are exceedingly various, and the qualities of the leather manufactured embrace a very extensive range of processes, machinery, and chemical substances. It is not our intention to describe any of these minutely.

All the processes of tanning are laborious, expensive, and tedious. It requires not only weeks- but months, to tan a hide well; and the cost of manufacturing leather in our country, from the raw material, amounts to no less than thirteen and a quarter millions of dollars annually. A great variety of new substances have been employed, and many curious plans adopted,

to shorten the period required in making good leather, nearly all, if not all, of which have proved entire failures.

We have published the patent specifications of Hibbard, Eaton, and Kennedy, for reducing the time of tanning. The object embraced in all of these patents, is the employment of some salt, gas, or acid, to open the pores of the hide and allow the tannic acid (which first combines with the gelatine, &c., of the skin at the surface) to enter into the core of the hide rapidly. The object to be obtained is the proper one, but the manner of accomplishing it is not correct, for if the pores of the skin are unduly expanded by any chemical action, that action must be injurious. Old and experienced Tanners have informed us that the remarks which we made respecting each of the tanning patents published by us, were theoretically correct and practically sound.

Good leather is not produced by the indiscriminate contact of hides and tanning liquor. We have been credibly informed by those largely engaged in the business, that not a single one of what are called "short processes," has been successful, or is now much used in our country; there seems to be a general feeling among practical tanners to scout the idea of new improvements in this extensive and most valuable manufacture.

Our principal object in writing this article is to point out the unreasonableness of such feelings. It surely cannot be denied that improvements in this art, as well as every other art, are desirable; and that man cannot have the true American spirit, who believes that tanning, as now practiced, is perfect and cannot be improved. While we make it a duty to comment freely on what we consider defects in any new or old plans, in machines or processes, we like to see every new plan (if it does not wear absurdity on its face) fairly tested and candidly judged of. This is the only way to progress and improve, and the failure of a thousand plans should never be held up as a bug-bear and a barrier to arrest the introduction and trial of a new and reasonable one to improve any art. It is our opinion that improvements will yet be made in the manufacture of leather, of such a character as will reduce its manufacturing cost at least one half, for it cannot possibly be considered a fixed fact, that this art has arrived at its "manifest destiny" of perfection.

Steam Fire Engines.

Miles Greenwood, chief engineer of the Cincinnati fire department, has succeeded in decreasing the weight of the steam fire engine eleven hundred pounds, and that too without impairing its efficiency in the least. The enormous weight of this machine has all along been its chief objection.—[Ex.]

Professor Renwick.

Prof. Renwick, who has occupied the chair of Natural and Experimental Philosophy and Chemistry in Columbia College, for more than thirty years past, has resigned, but at the request of the trustees of the Institution, he has consented to continue his course of lectures until March next. President King announced the resignation of the venerable Professor to the students on the 16th inst.

Elias Hall, of Louisville, Ky., informs us that he invented the new percussion priming described on page 10, this volume, "Scientific American," as being recently patented by J. Winnewater, of London. Mr. Hall states that in 1845 he informed the Secretary of War, and the Russian Minister of his invention, and he can prove it.

PRIZES!! PRIZES!!

The following Splendid Prizes will be given for the largest list of mail subscribers to the Scientific American, sent in by the first of January next:

\$100 for the largest list.	\$30 for the 7th largest list.
\$75 for the 2d largest list.	\$25 for the 8th ditto
\$50 for the 3d ditto	\$20 for the 9th ditto
\$45 for the 4th ditto	\$15 for the 10th ditto
\$40 for the 5th ditto	\$10 for the 11th ditto
\$35 for the 6th ditto	\$5 for the 12th ditto

The cash will be paid to the order of the successful competitors immediately after January 1st, 1854.

These prizes are worthy of an honorable and energetic competition, and we hope our readers will not let an opportunity so favorable pass without attention.

For Terms see Prospectus on the last page.