

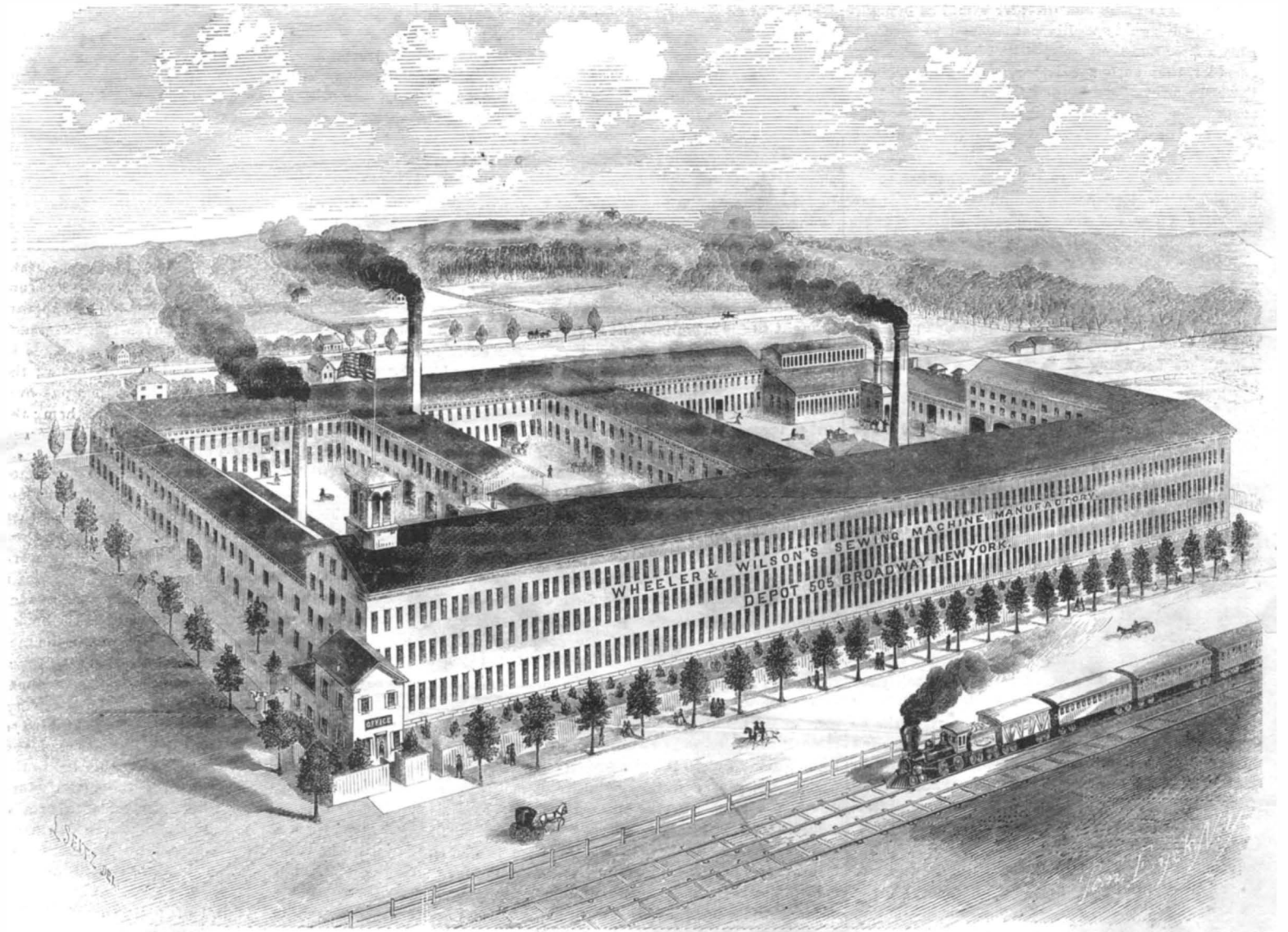
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WHEELER AND WILSON'S SEWING MACHINE MANUFACTORY.

The Wheeler and Wilson Sewing Machine—A Model Workshop.

The great inventions of modern times may be briefly enumerated. They are the steam engine, the electric telegraph, and the sewing machine. Others of great importance have been introduced, but we refer to these three, as those which have, to a great extent, revolutioned our social institutions. Certainly none can have a higher standing, in this respect, than the last one upon the list. While the others have created for themselves a fame and history which shines brilliantly among the mechanical achievements of the age, neither of them come so close to the common interests of both sexes as that machine which has signally triumphed over obstacles and prejudices which seemed insurmountable.

So great has been its popularity, that, in order to meet the demand for it, immense factories have been erected in different parts of the country. The feeling in favor of particular machines is perhaps something incomprehensible, when the general excellence of one is apparent to all. The industrial associations throughout the United States, as well

as the jurors at the great International Exhibition lately held at London, have declared almost unanimously in favor of the Wheeler and Wilson pattern. Its merits, as a machine for general work, are so palpable to those who are familiar with it, as to need no praise at our hands; lightness, ease of action, simplicity of design, thoroughness in construction, non-liability to derangement, these are the great essentials in a sewing machine, and these qualities are all combined in the one which we shall make the subject of our article. We were in East Bridgeport a few days since, where the Wheeler and Wilson Company have their factory, and thinking that a few hours could not be more profitably employed than in looking through it, we made known our desire at the office, when the President, Mr. Wheeler, at once afforded us every facility.

Let us, however, premise before going further, that the Company have no secrets in the construction of their sewing machine. To any one who is desirous of witnessing their tools and workshops, the doors are open and permission accorded to view everything and every branch of the business, from beginning to end. From Alpha to Omega, nothing

is concealed; a frank and liberal spirit which it would be well for the manufacturing community at large to imitate. Let us, also; entreat the sometime visitor who shall come after us, to remark the order and discipline which prevails on every hand. After this brief diversion, with Mr. Superintendent Perry, we enter the factory. Stepping across an ante-room from his office, he opens a door, and at once, a long vista of busy machines and their attendants is disclosed; five hundred and twenty-six feet in length, and thirty-six feet in width, are occupied on the ground floor by a system of machinery which seems to act with almost human facility and discrimination. Here the heavier parts of the sewing machine are prepared for the other fittings. In order to have a clear idea of the plan pursued throughout the establishment, it will be necessary to inform the reader that all the materials and tools are furnished by the Company, and the work is executed for them by contractors or jobbers. To each of these jobbers, a certain part of the work is assigned, one man taking the beds or solid frame of the machine, the frogs, as that part is called which carries the cloth presser, and the needle arm. Another man will make the

the piece which goes between the vibrating arm, the slide rings, the bobbin or spool up to the and any other divisions of the sewing which his experience or natural skill has the Company will be well executed in his Thus all the details are parcelled out among several contractors.

Now, be it borne in mind, the Wheeler and Wilson machine is not made from hand to hand, as the thing is, but from its inception to the last nail driven in the packing box which carries it to its final destination, every operation performed is but one of many, tending toward completion, that belongs to the mechanical system employed in the manufactory to insure absolute fidelity in every particular. It is easy to see that, if every jobber executed his work as best suited him, and according to his own ideas of what was required in the premises, a grand era of chaos and disorder would be inaugurated, which would speedily put an end to the Company's fame and the good quality of their machines. In order that such a catastrophe may be avoided, there are a set of gages, or duplicates, provided for every screw, spring, or bar, employed in the sewing machine; these gages are supplied to the various contractors, and are made from originals in the possession of the Company, to which no one has access but the superintendent. For each piece there is not only one gage, but there are also separate gages for every variation and curve existing in those shapes; so that every radius and every angle is precisely similar in each individual machine. It is not necessary to have a professional education in order to appreciate the benefits arising from this plan, but our mechanical readers will readily understand the advantages springing from it. We wish the manufacturing community at large could have one glance at the beautifully made and kept gages which the Wheeler and Wilson Company uses; our word for it, no one, who has a regular and stipulated pattern of an invention to make the year round, would ever be without similar devices.

Not only are these tests kept for the purpose of insuring accuracy in the forms of the working parts, but fac-similes are also made of all the screws, from the largest to the smallest; in their bodies, in their threads, and lastly, in the distance from under the head, to the point where the rounded top meets the sides. Since all the holes are drilled to just such a depth, as a matter of course, every screw must be of a standard length and size, and we can readily see how by conforming to the rules made for the guidance of the contractors, the whole factory works as one brain. Part after part goes through the required operations, never coming back from one machine to another, but entering at one end of the room, and so going the round of all the tools in the various stories, being finally carried into the inspecting rooms. Here they are put together, tested, run and approved. Indeed to such lengths is the principle of order and regularity carried, that after leaving the workshops, the visitor feels an irresistible inclination to step exactly square and true, and to otherwise conform to habits of regularity and method. Thus it will be seen that these factories have also a vast moral influence which must be felt to be appreciated.

Let us after this necessary introduction, look at the planing machine, on which the bottoms of the beds or frames are being faced; this being the starting point to which all subsequent parts are accessories, and the other operations subordinate, it is a very simple performance, and is only mentioned as a base of operations. After the bottom is faced, the bed is then removed to another machine, called in mechanical parlance, a miller or "slabber," this cuts out the recess for the feed-bar and trues the plate faces. The rib that receives the foot of the cloth presser or frog, and the squared faces at the back, are done upon another similar machine. Thus having secured two planes at right angles with each other, everything else is done with reference to them. As for instance, the several holes with which the sewing machine is pierced for shafts or screws; these are all in a line with some one of the other planes or faces, there is no obliquity or divergence from a right angle, unless such a feature is required in the machine.

The holes are drilled by what are called gang

drills, that is, one drill for as many holes as are required, all running in the same frame and revolving together. The bed is then placed in a "jig;" this is an apparatus which is furnished with projections that touch all the working faces in the sewing machine bed. The holes to be drilled are laid off in this jig, and bushed with hardened steel thimbles, so that their positions remain always the same. Supposing the plate of the drill press to be perfectly square, or at right angles with the tool, and the surfaces of the "jig" bearing upon it, also correct, the holes which are pierced by following those laid out in the pattern, are always true, and each machine in this particular is a fac-simile of the others. To see that the "jig" is always in a proper condition in the business of the contractor, for upon it depends the fidelity of his work.

Having thus seen the process employed in this one particular, we will not detail the others at great length. To do so would require a vastly greater space than that comprised in a newspaper article; follow us on down the shop, which is closely stowed with every conceivable variety of tool—some, indeed, inconceivable in their dexterity and ingenious working. Of the latter is the machine which makes the rotating hook, one of the most beautiful pieces of mechanism that it is possible to imagine. The hook and shaft are made out of a steel rod but very little larger in diameter than the finished piece; it is first cut off about seven or eight inches long, then heated in a furnace and placed under a drop press, which has dies in either face corresponding to the shape desired. Four distinct dies are necessary to bring it to the rough form. It is then annealed or softened and brought to the machinist, who performs all the work needful to complete it—such as turning the shaft to accurately, turning the hook part, which is, in this stage, nothing but a round button like a flattened pill box—placing the shaft in the lathe and cutting out the recess in front where the bobbin rotates—sawing down behind the face so as to form the clearance required—shaping the cast-off, and, in short, executing the multifarious details which must be completed before it is perfect. In all of these operations the machinist has little else to do than superintend the lathe or tool that does the work. From the soft steel, gray, cheese-like parings come away until the whole piece is of the required dimensions. So we follow through the shop, and see first one part and then another, brought into contact with the rapid noiseless cutter, until we have traveled nearly the entire length. We stop for a moment to look in at the two steam engines of eighty-five horse power, also built in Bridgeport, which drive the works, and remark the admirable cleanliness and order visible there; also to view the wash-rooms where the mechanics have every facility requisite to make themselves presentable to the outer world, though one would hardly think it necessary, so neat, intelligent and respectable do they look. We then hasten to follow our chaperon, Mr. Perry, to the second floor.

Here the smaller, and consequently lighter, parts of the sewing machine are fabricated, and we look upon operations similar to those we have just left. Ascending once more we find, in the third story, the several appliances which belong to the sewing machine in various stages of construction; these are the needles, spools, hemmers, and other extra appliances, the invention of which has greatly increased the machine's utility.

The needles deserve more than a passing notice; few persons have an accurate conception of the labor and time expended upon them. One, taken in the hand, is a slightly curved steel wire with a round body and a sharp point, whose eye is near the end; but to reduce it to this form, out of a piece of stock, requires much ingenuity. After the wire is softened, being previously cut to the right length, it is turned in a lathe to nearly its proper shape; the groove must then be formed in one side. For this purpose a pair of steel dies are made having grooves in them the size of the intended needle; in the center of this groove is a raised edge or rib, running along as far as it is desirable to carry the recess to be made in the former. The thickness of the rib varies in the standard of the implements made; in the 0 number, for instance, which is the finest size, the groove is not much wider than the column rules of this journal. When we reflect that an eye or hole for the thread

has to be drilled in this needle, and the groove polished, we are naturally astonished, nevertheless it is done. By means of a fine thread, the size with which the needle is to be used, and some flour emery, or its equivalent, the eye is polished and left perfectly smooth. To make perfect needles much skill and care is necessary. Mr. Perry informed us that he frequently received proposals from abroad from parties desiring to furnish the company with this branch of their manufacture, stating, as an inducement, that they could make them much cheaper. Unfortunately, however, for the proposers in one instance, the sample sent was very much poorer in quality than the worst ones thrown away weekly by the company. And we might cite many other instances which would support the value of the system insisted upon by the company, that is—absolute accuracy in construction.

In one of the lower shops we were shown a hook shaft which had a slight scratch in it, made by the turning tool; its value was not impaired in any way—it would work perfectly, but yet it was, we were informed, likely to be condemned, because, as our guide remarked, to allow it to pass unnoticed would be a departure from established rules, for which there was no precedent, and to which infraction no bounds could be set. Here lies the secret of the success of the Wheeler & Wilson sewing machine; for as all parts are interchangeable, being exact duplicates, the one of the other, entire uniformity throughout is attained.

The growing length of our article warns us to be brief. We must pass through this department hastily, only glancing at the bobbin or spool that runs between the hook and slide ring; this is, in appearance, the simplest part of the invention, but much depends upon its construction. They are made in three pieces, the two sides and a brass center; the sides are stamped out of a tin sheet, then put over the brass center, and that closed up on to them; the spool is then apparently done, but it must be placed in the lathe, turned to an exact size at its edges, and to a specified shape on its sides. Mr. Perry informed us that at one time great difficulties were encountered in the working of their sewing machines, they would go very well for a time, but on resuming operations, after ceasing a while, no satisfactory work could be done. This, as it may be supposed, was a source of much anxiety to the Company, and our informant stated that the trouble was laid to the hook; that whenever anything was out of order in the machine, that part always took the burthen of the blame. Finally, however, he took a machine home and puzzled over the cause of its mal-operation for some time, until he at length discovered that by always putting the bobbin with the same face toward the hook it ran perfectly well. This trouble led to the invention of special machinery for the manufacture of this part, and no further inconvenience of any kind is experienced.

With this little interpolation, let us leave the machine shops and all their attractions behind, and enter other apartments. If we look in at this large room we shall find it full of polished and finely-executed cabinet-work. These are the cases which adorn and protect the new household god that now sits upon nearly every hearthstone in the land. We remark how the tables are put together in sections, so that they shall not check or spring, each one being made of five thin pieces laid one upon top of the other and then glued fast. Let us pass the packing room and the japanners at their labors, and go to the "tuners" or inspection rooms. This branch of the sewing-machine business comprises the accurate and final adjustment of the several details which have passed through other hands. Unto these men is given the authority to reject any and every portion of the work that does not agree with the gages; for these latter tools are brought into requisition again for the we-do-not-know how many hundredth time. Arbitrary accuracy is insisted upon, and the unlucky jobber or workman, whose labor is thrown out, must bear the expense of it himself. After the machines are all adjusted, they are then put on a long table, and run for two hours, by belts attached to the shafting overhead, so that all their working parts may have the little asperities which still exist in them, smoothed off. They are then handed in to a mysterious-looking apartment, closely walled in on all sides, having the announcement "No admittance"

staring us in the face; by reason of the presence of the superintendent, however, we march into this *sanctum* and see the practical operations there. The workmen alone are excluded from this room; visitors accompanied by the authorities are at all times allowed access to it, as they are to all the other departments within the building.

It will be palpable to any one that this department requires much experience with the subject, and great business integrity, for into the hands of these two men are committed the reputation, in a great degree, of the Company's manufacture. No matter how well made they may be, primarily, if the adjustment is bad the machine is unsatisfactory in its operation. The machines are sewed with and tested in every way to prove them, and if they fail in any one particular, the inspector opens a little door in his apartment and thrusts the machine out with its fault affixed to it written on paper. No words pass on either side, and the affair seems quite an inquisitorial process. If every part works harmoniously, the piece of cloth that was used in trying the machine by sewing, is left on the plate with the thread still through it, both above and below, remaining in the needle. This prevents any suspicion on the part of purchasers that the piece was ingeniously manufactured for business purposes and then attached to the Wheeler and Wilson machine. It is almost supererogatory to say in concluding this division of our article, that none but the best materials are used. The steel for the hook and shaft (it being all in one piece) is English, the cast iron is American, and the wrought iron is also native, from Ulster county, one of the finest brands in the world for tenacity and integrity of fiber.

It is with much regret that we pass, with only a slight mention, the several branches of decorating the machine, of silver-plating, and the foundry and blacksmith departments. In the artist's rooms we saw several machines most beautifully finished in gold and pearl, and indeed, in all the different trades and operations carried on within the workshop, such as cabinet-making, the foundry, the japaners, finishers, decorators, blacksmiths, adjusters and needle makers, matters of new and striking interest presented themselves. It is only left us in concluding our article, to remark upon some of the most noticeable features of this vast manufactory. These are the cleanliness, order, and good discipline which prevail, and also the system of gages, and the thoroughness and utter fidelity throughout of the different attachments of the sewing machine with relation to each other. Such a complete and perfect principle of accuracy as the gages used secure to the Company has never fallen under our notice before. We have seen many shops where perfection was supposed to be the rule, but it was so far from being the case that any irresponsible person altered the drills, or rimers, as best suited his own sovereign pleasure. Of course, where such departure from established rules occur, the routine once broken is never re-established. The perfect good feeling and mutual respect co-existing between the superintendent and the employes, was not the least agreeable part of our visit. And for one we can bear witness to gentlemanly qualities on the part of our guide, to whose modesty we hope we shall not do violence, if we mention his "initials"—Mr. Perry.

It is remarkable also, to see a machine shop where no files are used; we mean by this, none in comparison to what are generally consumed. The various tools do all the work without further finishing, except such as is given to them by emery wheels and the operations. Those who have seen Messrs. Wheeler and Wilson's invention need not be told how beautiful that is. Near the factory is a beautiful brick engine-house which shelters a fine steam fire-engine, called the "Seamstress," one of the handsomest pieces of workmanship we have ever seen, belonging to the Company and manned by its employes. A brass band and drum corps, recruited from the 320 men in the Works, discourses music of an excellent quality.

We leave the factory, but cannot throw off so soon the impressions which have fixed themselves upon us during our visit. To look upon the long row of workmen, intelligent, well to do, and industrious, gives one new ideas of the value of well-directed labor. Among the contractors are some who have made fortunes by their own industry and ingenuity.

One of these persons was pointed out to us, who made his drawings for new machines so perfect that the men constructed these directly from the design; and if the tools were found inoperative or useless, the defect was through some radical fault, not in any want of precision in the drawing.

It has been remarked and lamented by various writers that the romance of the seamstress or sewing woman's life has been destroyed by the introduction of machinery. If, in speaking of romance, it is intended to recall dark and cold garrets, fireless and foodless rooms, scanty and insufficient raiment, and starvation and temptation to nameless vice generally, then we fully agree with those poetasters, who deplore the loss of their occupation, that the gloomy pictures which we have mentioned are among the past. Aladdin wore a ring upon his finger, which caused, when he rubbed it, a fierce genii to appear who gave him sundry and manifold possessions. But what was Aladdin and his swarthy slave to our modern servant, who performs tasks with an ease and celerity that would have made the homely old ogres in ancient story stretch and strain their mighty sinews in vain? It would be a fine fancy to suppose all the material operations of nature suspended for awhile, and to let sound cease, and the roar and rush of clashing humanity still for a time its turbulence. Then from the remote parts of the globe, nay even from the borders of the desert, let the sewing machines begin their song; say, what theme could be like that? No English lark, soaring at day dawn from the green bosom of the fields, trills forth such strains; for the bird's hymn is but the natural impulse which the earth's bounty suggests, while the whirl of the sewing machine tells of the power and strength of the human brain. It boasts of the attributes imparted to it, and carries conviction to every hearer, that, through the steady pursuit and triumphant achievement over great obstacles, the sewing machines have won their way in the world until they stand almost as new mechanical forces.

We cannot imagine anything more capable of being wrought into an original and beautiful romance than the invention and results of the sewing machine. By the fountain in the desert the Bedouin may fill his water-skins, if he chooses, whose seams no longer let through the precious fluid. The Turks in their lethargic sittings may band their dusky foreheads with turbans white and fair with pearl-like stitches; or away through the tall grass of the Western prairies, the horseman flies like the wind, with the scarlet blanket streaming from his back, bound and hemmed by the Wheeler and Wilson sewing machine. The contemplation of its resources opens at once to the reflecting person a long vista of delightful fancies upon which we should like to dilate at length. Let us, however, close our article with the assurance that whatever old associations have been removed by the use of the sewing machine—the good wife sitting at her fireside with the slow-plodding needle, or the maiden at her lattice singing over her embroidery—the loss has been more than repaid by the increased benefit to mankind and the great human family, throughout the habitable globe, by increased comfort as well as great pecuniary gain.

To the able and indefatigable President of the Company, Mr. Wheeler, we are under great obligations for facilities afforded and much valuable information, as also for personal courtesies, to do justice to which type are wholly inadequate.

VALUABLE RECEIPTS.

CIDER AND OTHER WINES.—When cider has fermented for about one week in a cask, add half a pound of white sugar to every gallon; then allow it to ferment further until it has acquired a brisk and pleasant taste. An ounce of the sulphite of lime is then added for every gallon of cider in the cask, and the whole agitated for a few minutes and then left to settle. The sulphite of lime arrests the fermentation, and in the course of a few days the clear cider may be poured off and bottled, when it will retain the same taste that it had when the sulphite was added. About an ounce of the sulphite of lime added to the gallon of cider in any stage of fermentation will preserve it from further change. A sparkling cider wine is produced by the mode described. The following is another method of making cider wine:—Take pure cider as it runs from the press and add a pound of

brown sugar to every quart, and put it into a clean cask, which should not be filled to within about two gallons of the top. The cask is then placed in a moderately cool cellar or apartment and the cider allowed to ferment slowly by the bung-hole being left open until it has acquired the proper taste and sparkles when a small quantity is drawn. The cask is then bunged up tight.

We have given these receipts for what is worth, because they are followed by many persons making wine artificially from cider, but a real pure and first-class wine cannot be manufactured by the use of cane sugar in vegetable juices. It is a remarkable fact that currant, cider, grape and other wines that are made by adding common cane sugar to fruit juices are very similar in taste—the flavor being what is called "smoky." This is due to the fermentation resulting from cane sugar. The vinous fermentation of the pure juice of the grape is due to grape sugar, which is entirely different from that of the cane.

Grape wine should be allowed to remain for a long period in oak casks after it is made, before it is bottled, otherwise it will be comparatively sour to the taste. This is owing to the great quantity of the tartrate of potash in the juice of the grape. When standing in a wooden cask the tartrate is deposited from the wine and adheres to the interior surfaces of the vessel, and it forms a thick and hard stony crust called "argol." This is the substance of which our cream-of-tartar and tartaric acid are made. In its crude state it is employed by silk and woolen dyers in producing scarlet, purple and claret colors in conjunction with cochineal and logwood. This explains the cause of wines becoming sweeter the longer they stand in casks in a cool situation.

Wines may be made of the juice of the sorghum cane by permitting it to ferment for a short period in the same manner as has been described for cider, then closing up the cask tight to prevent access of air. The fermentation of all saccharine juices is due to the combination, chemically, of the oxygen of the air with some of the carbon in the sugar of the juice. A small quantity of alcohol is thus generated and absorbed by the fermented juice. Carbonic acid gas is also generated; when absorbed by the liquid and retained under pressure this gas imparts the sparkling property to wine. When the saccharine juices are undergoing fermentation they must be tasted frequently for the purpose of arresting the fermentation at the proper stage, because there are two stages of fermentation, called the vinous and acetous. The first is that in which alcohol is produced; the second vinegar. Many artificial wines have a slight vinegar taste which is caused by allowing the fermentation to proceed a little too far. These hints will be useful to those who prepare light domestic wines. These are now made very generally, and are held to exert a favorable influence in many cases of dyspepsia.

ointment for CHAPPED HANDS.—Take sweet oil, 3 ounces; spermaceti 4 ounces; and pulverized camphor, 1 ounce. Mix them together in a clean earthenware vessel by the aid of gentle heat, and apply it warm to the hands night and morning. Another very good ointment for chapped hands is made with a little fresh newly-churned butter and honey.

SULPHURIZED OIL FOR WOOD.—M. Lapparent, inspector of timber for the French navy, states that he prepared a paint for preserving timber composed of linseed oil, sulphur and manganese, which was found very effectual. The flowers of sulphur were stirred into linseed oil in about equal quantities, by weight, and about twelve per cent of the oxide of manganese added. This was applied to some oak logs which were buried in a manure heap for six months, when the wood was found to be uninjured—no fungi were formed upon it. Unprepared wood subjected to the same treatment was covered with fungi.

DECLINE IN THE PRICE OF RAGS.—The *Boston Journal* says:—"Rags are going down. On Wednesday they fell two cents, and greater declines are threatened. The amount of paper stock which the present high prices has brought forward is immense. Old paper has fallen to four cents a pound, and one party in this city, who has been buying very largely, has stopped purchasing, having now over 50,000 pounds on hand. Those who are hoarding their rags or old paper had better sell at once."