

THE LOCOMOTIVES OF 1825 AND OF 1875.

There are few great inventions of modern times regarding the original conception of which there is not considerable difference of opinion. The sewing machine and the screw propeller have been credited to various inventors according as the weight of evidence, in favor of one man or the other, has impressed different chroniclers, and the same is the case with the steamboat and the locomotive. Regarding the last especially, there are sharply marked differences of opinion, amounting in many instances to conviction, strengthened perhaps by the dispute partaking something of an international character. In this country it is customary to ascribe the origin of the steam carriage to Oliver Evans, who, in 1787, obtained from the Maryland legislature a patent for steam carriages, which he designed as a means of transport

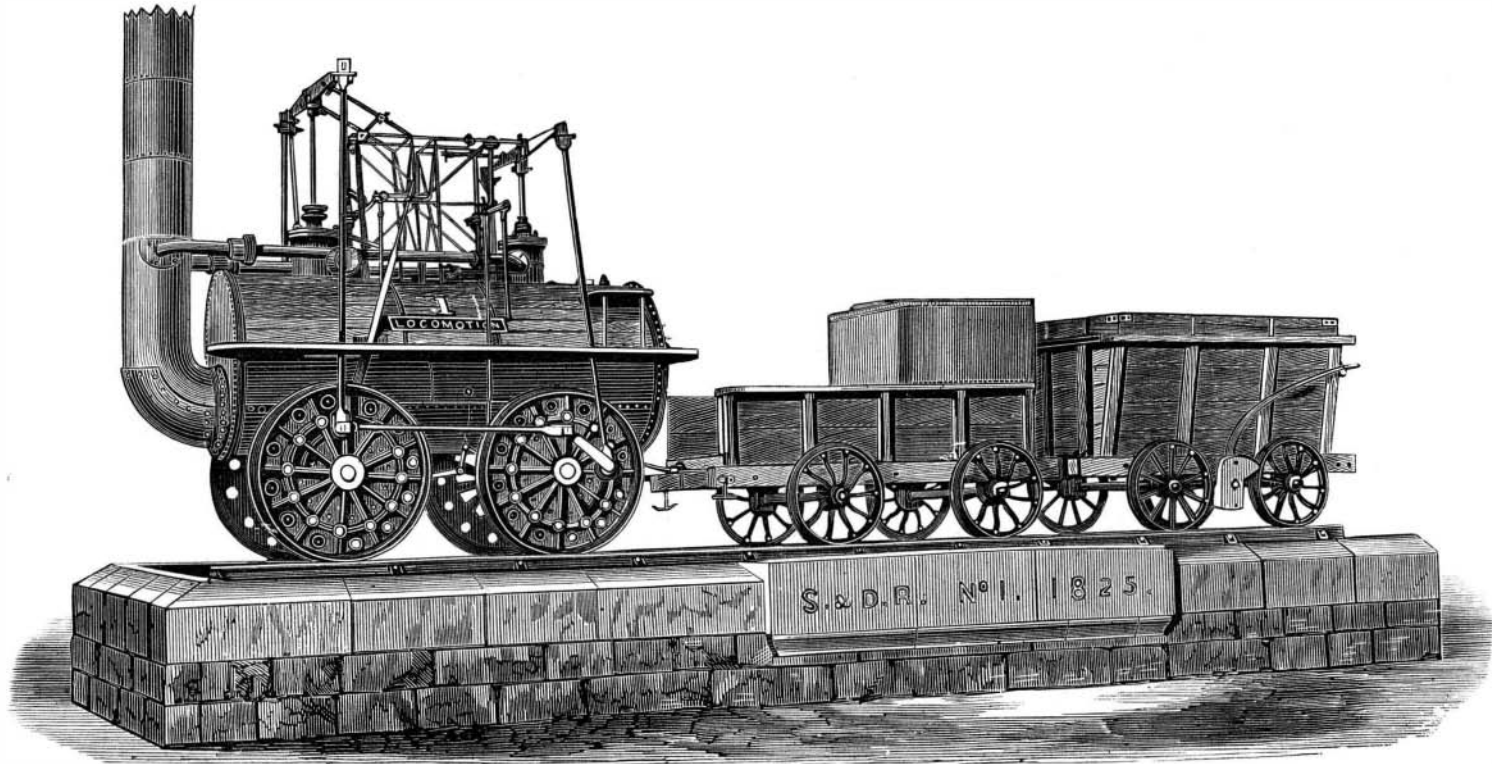
was done with the locomotive other than to apply it as a traction engine for coal and ore. Sometimes it was used on rails; again, it lumbered over the king's highway, to the unalloyed astonishment of the travelers thereon. It was reserved for Stephenson to conceive of its application to the drawing of stage coaches on a road provided with metal rails, and practically to test his theories on that September day, the fiftieth anniversary of which has just been so enthusiastically celebrated in England. Rails were placed between Stockton and Darlington, and the Locomotion ran over them at the astounding speed of eight miles per hour. The reader, in our first engraving, has before him a representation of this first passenger locomotive, as it now appears, placed as a monument upon a massive pedestal. The plain straight boiler, ten feet in length by four feet in diameter,

such are the contrasts the lapse of half a century brings together.

We add a second engraving, for the sake of the comparison, of one of the most powerful locomotives ever used on a narrow gauge railway. It was built in England in November, 1874. Its boiler is 10 feet long by 4 feet in diameter, and contains 210 tubes of Low Moor iron, 1½ inches in diameter. The cylinders are 17 inches in diameter by 30 inches stroke. The boiler carries 140 pounds per square inch pressure; and with a train of fourteen cars, the locomotive has accomplished a speed of sixty miles per hour.

Practical Painting.

Everybody knows that the painting of first class passenger railway cars is a work of skill and experience. Good direc-



THE LOCOMOTION, THE FIRST PASSENGER LOCOMOTIVE.

of flour to and from mills. Evans found, however, that his engine, which by the way was the first ever built on the high pressure principle, worked better in mills than in carriages, so the initial vehicle upon which he was engaged at the time of this discovery, it appears, was not finished. In 1794, Evans sent his plans to England, and there, it is reported, Vivian and Trevithick gained access to them and pirated some of the ideas, a statement vouched for in the new edition of Appleton's *Cyclopaedia*; but which the reader, conversant with the lives of these eminent inventors, will hardly credit. Unfortunately for Evans' claims, his invention had been anticipated and practically carried out in France eighteen years previously; and the ancient locomotive built by Cugnot in 1769, noticeable for its crude though ingenious mechanism, antedating the introduction of the crank, and necessitating the odd ratchet-like device for moving its wheels, still exists, standing in the same hall with the looms of Jacquard and Vaucanson in the Conservatoire des Arts et Métiers, in Paris. Besides, in 1784, Watt and his assistant Murdoch

has a single flue and sixty square feet of heating surface. The safety valve lifted at twenty-five pounds pressure. Above the generator are two cylinders, ten inches in length by twenty-one inches stroke, their pistons working cross beams which were coupled to the connecting rods, which in turn rotated the wheels. A loose eccentric sheave and bell cranks operated the flat slide valves; and from a crosshead on the piston rod, the pump was worked. Add a wooden framework, no brakes, a little tender capable of holding 240 gallons of water, and the picture of the machine which annihilated the pet theories of the majority of the skilled engineers of its day is complete.

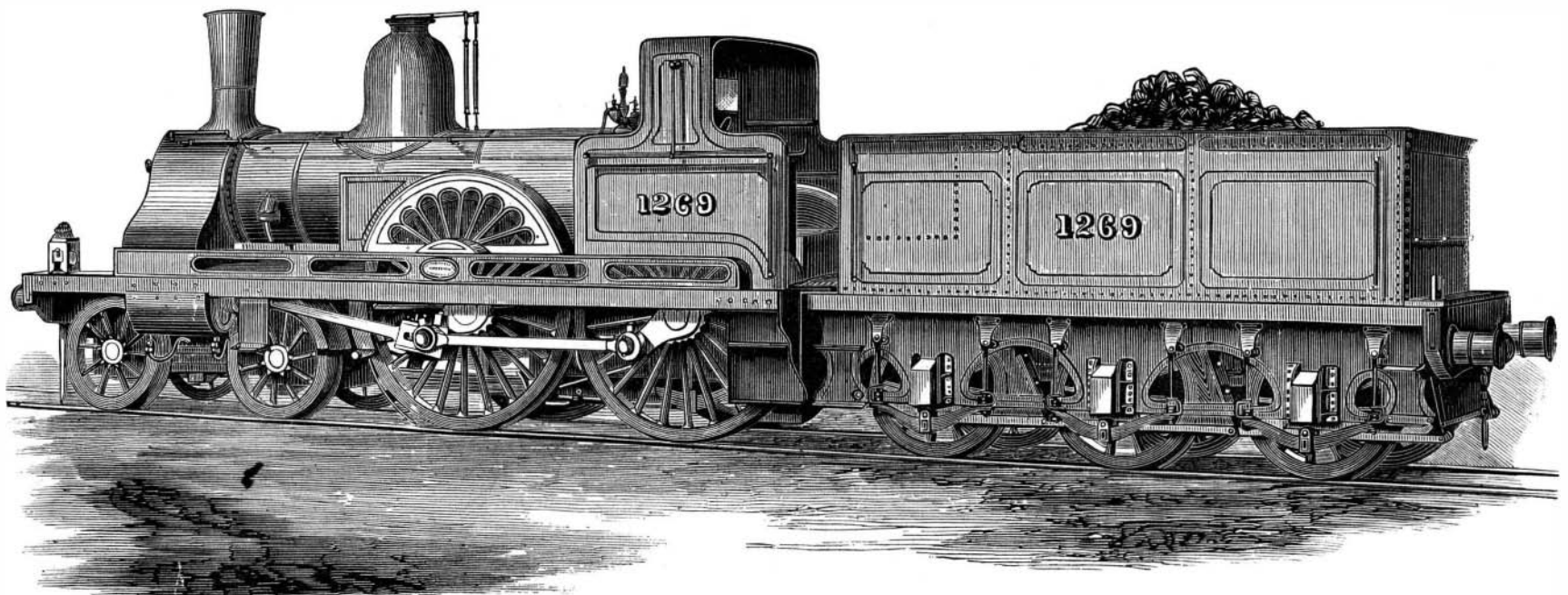
Fifty years have gone by since this machine was built; years that have seen a greater progress in civilization and in the arts than decades before. The few miles of track between the out of the way little English towns have grown and ramified until their iron network, already pushing its way into the wildernesses of Siberia and the burning sands of the African deserts, will soon have encompassed the world.

tions for painting of this kind ought to be found useful wherever the brush is employed for first class work, and we therefore give the following:

The sixth annual convention of the Master Car Painters' Association was held at the Grand Central Hotel in this city, on the 8th and 9th of September. Mr. R. McKeon, the Secretary and Treasurer, delivered the following address on the "Process of Car Painting," which we find in the *National Car Builder*.

"I make no great profession of my ability, but I certainly should have acquired some knowledge, and that of a practical nature, some twenty-five years having been exclusively devoted to the business. My long experience and constant practice, bringing me in contact with others of the profession, have given me that knowledge of the art which can only be secured by close attention and some study,

A first class railway coach, on any of our main roads, costs, when complete, about \$6,000. To protect this work, the painter expends from \$300 to \$600. The latter figure will



A MODERN LOCOMOTIVE.

both patented locomotive carriages in England, so that, much as it has possibly gratified some authors to prove the locomotive an American invention, their views do not stand the test of recorded fact.

At the risk of being considered as having diverged from our subject, we prefix the above brief scrap of history as of interest in connection with the two engravings given herewith, the quaint old machine in one of which marks the beginning of the development of the now vast railroad system. From the period above referred to, up to the year 1825, nothing

For the old stage coach bodies, deprived of their wheels and mounted on trucks, which constituted the first railway cars, there have been substituted elegant saloons where one may eat and sleep in luxury over journeys from ocean to ocean; instead of the slow, wheezing machine, typical of childhood in its fragility and incapacity, now exists the magnificent engine, equally typical of the strength and might of manhood. Six tons of rude machinery crawling along at eight miles per hour: sixty-five tons of the highest efforts of the artisan's skill rushing over an iron road at a mile a minute;

make a first class job. The car has been completed in the wood shop, and is turned over to the painter, who is responsible for the finish. He is expected to smooth over all rough places or defects in the wood, which requires both patience and skill to make the work look well. Twelve weeks should be the time allowed to paint a car, and it cannot be done in any less time, to make a good job that will be a credit to the painter and all other parties interested in the construction and finish of the car. Too much painting is done in a hurry; proper time is not given the work to dry or become

thoroughly hardened before it is run out of the shop, and consequently it does not always give the satisfaction it should; nor can it be expected that hurried work will be so lasting or durable as that which has the necessary time given to finish it.

THE PRIMING PAINT.

The priming coat of paint on a car is of as much importance as any succeeding one, and perhaps more. I have seen good work ruined in the priming by little or no attention being given by the painter to the mixing and applying of the first coat. The foundation is the support, and on that rests your success or failure. The priming should be made of the proper material, mixed with care from good lead and good oil, and not picked up from old paints, which have been standing mixed and must necessarily be fat and gummy, for such are unfit for use on a good job, and will have a decided tendency to spoil the whole work. Special care should be exercised, both in mixing and applying the priming, and it should be put on very light, so that it may penetrate well into the wood. Too much oil is worse than not enough. Good ground lead is by far the best material for the under coats on a car; and although I have tried other materials for priming, yet I have failed to find anything equal to the lead. Two coats should be given to the car before it is puttied, as it is best to fill well with paint the nail holes and plugs, as well as defects in the wood, so that moisture may not secure a lodgment, which otherwise will cause putty to swell, although sometimes unseasoned lumber will swell the putty; and as it shrinks, the nail remains stationary, and of course the putty must give way.

THE BEST PUTTY.

In mixing putty, which may be a small matter with some, take care to so prepare it that it will dry perfectly hard in eighteen hours. Use ground lead and japan, stiffening up with dry lead, and whatever coloring you may require in it to match your priming coats.

The next coats, after the work is well puttied, should be made to dry flat and hard. Two coats should be applied, and, for all ordinary jobs or cheap work, sandpapering is all that is necessary for each coat; but when a good surface is required, I would recommend one coat to be put on heavy enough to fill the grain; and before being set, scrape with a steel scraper. The plain surface is all that requires coating and scraping with the heavy mixture; for this coat, which we call filling, I use one half ground lead and any good mineral which experience has shown can be relied on. This scraping of the panel work will fill the wood equal to two coats of roughstuff, and it saves a great amount of labor over the old process, when so much rubbing with lump pumice stone was done. Sandpaper when the filling is thoroughly hard, and apply another coat of paint of ordinary thickness, when, after another light sandpapering, you have a good surface for your color.

Rough coating on cars has gone almost out of use, and I believe that but few shops are now using it to any extent. My experience is that paint has less tendency to crack where roughstuff is left off. I do not claim that the filling was the principal cause of the cracking, if it was properly mixed; but I believe the water used in rubbing down a car with the lump pumicestone injures the paint, as it will penetrate in some places, more particularly around the moldings and plugs.

THE FINISHING COLOR.

The car being ready for the finishing color, this should be mixed with the same proportion of dryer as the previous coat, or just sufficient to have it dry in about the same time. A very great error with many car painters is using a large portion of oil in the under coats, and then but little, if any, in the finishing coats; this has a decided tendency to crack, the under coats being more elastic. I always aim to have color dry in about the same time, after I have done my priming; by this plan, I secure what all painters should labor to accomplish—namely, little liability to crack. Work will of course crack sometimes, after being out a few months, or when it has repeated coatings of varnish; and using a quick rubbing varnish on work will cause it to give way in fine checks quicker than anything else. Many of the varnishes we use are the cause of the paint cracking, and no painter has been wholly exempt from this trouble.

CAUSE OF CRACKING.

The most common cause of cracking is poor japan, which is the worst enemy that the car painter has to contend with; the greater part of the japan that we get is too elastic, and will dry with a tack, and the japan gold size we have generally the same fault, although the English gold size is generally of good quality, but its high price is an objection to its use. A little more care in the manufacture of japans would give us a better dryer, and few would object to the additional cost. Japan that I have frequently had, I found to curdle in the paint; it would not mix with it, but would gather in small gummy particles on the top. Work painted with such material cannot do otherwise than crack and scale, and the remedy lies only in getting a good pure article of turpentine japan.

In regard to using ground lead, car painters differ, as some prefer to grind their own in the shop. I use the manufactured lead, and my reasons for doing so are that it is generally finer than any shop can grind it with present facilities, and it has age after grinding, which improves its quality. You can also get a purer lead and one with more body than you can by grinding in the shop, which is a fact that I think most painters must admit; I have tested it very fully, and am convinced on this point.

MIXING THE PAINTS.

Permit me to make a few suggestions here in regard to

the mixing of paint, which may not fully agree with others' views. There is just as much paint that cracks by putting it on too flat as by using too much oil. I have seen some painters mix their finishing color so that it was impossible to get over a panel of ordinary size before it was set under the brush, and consequently the color would rough up. Color should be mixed up so that it will not flat down for some time after leaving it, and then you have got some substance that will not absorb the varnish as fast as it is applied to the surface. This quick drying of color is not always caused by want of oil in it, but because there is too much japan, and a less quantity of the latter will do better work, and make a smoother finish. Give your color forty-eight hours to dry between coats; I always give that time, unless it is a hurried job, and we have very few such jobs in our shop, as experience has fully demonstrated that it is poor economy to hurry work out of the shop before it is properly finished.

OILS, DRYERS, AND COLORS.

In car painting, both raw and boiled oils are used, and good work may be done with either, but I would recommend oil that is but slightly boiled in preference to either the raw or the boiled. After it is boiled, if it is done in the shop, let it stand twenty-four hours to settle, then strain off carefully; this takes out all the impurities and fatty matter from the oil, and it will dry much better, nor will it have that tack after drying that you find with common boiled oil. Use the proper quantity of dryer in mixing your paint, and a good, reliable job will be the result. In car painting, I would never recommend the use of prepared colors which are ground in oil, as nine tenths of such colors are ground in a very inferior oil, and they may have been put up for a great length of time, in which case they become fatty, and will invariably crack. These canned colors do not improve with age, as lead and varnish do. Finishing colors should all be ground in the shop, unless special arrangements can be made with manufacturers to prepare them; and the color should be fresh, not over six or eight days old after being mixed and open to the air. Enough may be prepared at a time to complete the coating on a job; but when color stands over a week, it is not fit to use on first class work, as it becomes lifeless, and has lost that free working which we find in fresh mixed colors; such color may, however, be used upon a cheap class of work, or on trucks, steps, etc., so that nothing need be wasted in the shop.

VARNISHING.

Three coats of varnish over the color are necessary on a first class coach. The first coat should be a hard drying varnish put on the flat color; the quick rubbing that some use I would not recommend, but one that will dry in five days (in good drying weather) sufficiently hard to rub is the best for durability. After striping and ornamenting the car, and when thoroughly washed, give a coat of medium drying varnish; let this stand eight days; then rub lightly with curled hair or fine pumicestone, and apply the finishing coat, which is "wearing body"; this will dry hard in about ten days, after which the car may be run out of the shop. It should then be washed with cold water and a soft brush, and it is then ready for the road. In varnishing, many will apply the varnish as heavy as they can possibly make it lie, when, as a consequence, it flows over and runs or sags down in ridges, and of course does not harden properly; this also leaves a substance for the weather to act on. It is better to get just enough on at a coat to make a good even coating which will flow out smooth, and this will dry hard, and will certainly wear better than the coat that is piled on heavily.

Varnishing, we claim, can be overdone, some painters' opinions to the contrary. We have heard of those who put two and a half gallons on the body of a fifty foot car at one application, and we have also listened to the declaration, made by a member of the craft, that he put two gallons on the body of a locomotive tank. Such things are perhaps possible, and may have been done; but if so, we know that the work never stood as well as it would if done with one half the quantity to a coat. In varnishing a car, care should be taken to have the surface clean; water never injures paint where it is used for washing; and a proper attention to cleanliness in this respect, and in the care of brushes used for varnishing, will insure you a good-looking job.

Perhaps your shop facilities for doing work are none of the best, but do the best you can with what you have; select, if possible, a still, dry day for varnishing, especially for the finishing coat. Keep your shop at an even temperature; avoid cold drafts on the car from doors and windows; wet the floor only just sufficient to lay the dust, for, if too wet, the dampness arising will have a tendency to destroy the luster of your varnish. Of course we cannot always do varnishing to our perfect satisfaction, especially where there are twenty-five or thirty men at work in an open shop, and six or eight cars are being painted, when more or less dirt and dust are sure to get on the work.

A suggestion might here be made to railroad managers, which is that no paint shop is complete where the entire process of painting and finishing a car is to be done in one open shop. A paint shop should be made to shut off in sections by sliding doors, one part of the shop being used exclusively for a riping and varnishing. I know from experience that nine tenths of the railroad paintshops are deficient in this particular, and still we are expected to turn out a clean job, no matter what difficulties we are compelled to labor under. Many further hints might be given in regard to this matter of shop facilities and conveniences; but as it is not here my object to argue the point, I leave it with this brief mention.

IMPORTANCE OF WASHING VEHICLES.

In regard to the care of a car after it has left the shop, I

think more attention should be given to this than is done on many roads. The car should not be allowed to run until it is past remedy, and the dirt and smoke become imbedded in the varnish, actually forming a part of the coating, so that when you undertake to clean the car you must use soda or soap strong enough to cut the varnish before you succeed in removing the dirt. Cars should be washed well with a brush and water at the end of every trip; this only will obviate the difficulty, and these repeated washings will harden the varnish as well as increase its luster. We know that, in washing a car, where soap is required to remove the dirt and smoke, it is almost impossible to get the soap washed off clean; and if it is not quite impossible, the hot sun and rain will act on the varnish and very soon destroy it.

RE-VARNISHING.

Cars should be taken in and re-varnished at least once in twelve months; and if done once in eight months, this is better for them, and they will require only one coat; but where they run a year, they will generally need two coats. Those varnished during the hot months will not stand as well as if done at any other time. Painting done in extreme cold weather, or in a cold shop, is more liable to crack than if done in warm weather.

HOW TO DRY PAINT.

Paint dried in the shop, where there is a draft of dry air passing through, will stand better than that dried by artificial heat; and you will find, by giving it your attention, that work which has failed to stand, and which cracked or scaled, was invariably painted in the winter season or in damp, wet weather. I have paid some attention to this matter, and know the result."

Brewing Beer in New York City.

New York is now, paradoxical as it may seem, one of the largest German cities in the world. Our one hundred and fifty-one thousand Teutonic citizens outnumber those of Frankfurt and of Bremen, and approach very nearly the number of the population of Dresden or of Munich. It is to this circumstance, perhaps more than to any other, that the constant increase of the number of breweries in the city, and the frequent improvements in the manufacture of that popular beverage "lager beer," are due. As to the quality of the "bier," connoisseurs say that that made in this State is the best. The *Buffalo Express* asserts in the following positive terms that beer made in Buffalo is unapproachable. We will not question the editor's experience, as our own is scanty; but still for the credit of the metropolis, we venture the remark that New York breweries are larger and include more refinements in beer-making than others elsewhere in the country. The *Express* writer talks over his beer thus: "Cincinnati beer is good, Milwaukee beer is better, but Buffalo beer is alone and unapproachable. It is the *ne plus ultra* of lager. You may wander east and wander west, and you will find none like it. Rochester beer is execrable. A glass of it is a stronger argument for temperance than any which has yet been invented. A careful temperance advocate has accurately estimated that every barrel of ordinary beer contains half a suicide, three fourths of a murder, and a half dozen free fights. Rochester beer contains all these evils in a "schuper," besides other miseries too numerous to mention. Hence it is that when peaceable Rochester folks want a glass of beer, they come to Buffalo after it, or have it sent in bottles to them. The essence of comfort is a summer night at Schenkelberger's, with a glass of Herr Ziegler's lager to moisten the music of the Union Cornet Band. Then it is that one begins to appreciate life."

Against this, we set off the following description, from the *Evening Post*, of a big malthouse which has just been erected in the upper portion of New York city.

The malthouse consists of three buildings. The main building is 130 feet x 92 feet 8 inches in ground dimensions, and ten stories in height, with a deep basement. The first and second stories are respectively 13 and 12 feet in height in clear, while the remaining stories are but 6 feet in height. The lower stories will be used for storing grain, and have a capacity of a quarter of a million bushels. The walls of the basement are of stone, three feet in thickness, and the superstructure is of brick and of the most substantial character. The lower floors are of yellow pine, while the malting stories are floored with a pavement of concrete, with the exception of one story, on which is laid a flooring of Solenhofer stones, resembling those used by lithographers, imported from Germany. On these floors the grain is allowed to grow after its removal from the steeping vats in the cellar. At the top of the building is a tank holding five thousand gallons of water, which supplies the entire building. At the west end of the building, separated from the main part by a three feet partition wall, are two large storage rooms and the kilns. These are fireproof, eighteen feet deep extending across the width of the building, and are constructed on a plan invented in Germany, by which the grain is more rapidly treated than formerly. By an ingenious contrivance it is turned mechanically at frequent intervals, so as to allow the hot air from the furnaces to reach it uniformly, with a saving of time and an economy of grain.

The building containing the offices, engine, and boiler rooms, and storage bins for forty thousand bushels of grain, is triangular in shape. It is of brick, 57x37x36 feet, and five stories in height.

The malting season begins about the 1st of October and lasts for from thirty to thirty-two weeks. It is estimated that in that time this malthouse will produce at least three hundred and fifty thousand bushels of malt.

The cost of the building, with fixtures, machinery, and appliances, will be between \$100,000 and \$150,000.