JOURNAL OF PATENT LAW.

NECESSITY OF CORRECT SPECIFICATIONS IN LETTERS PATENT—THE ENTIRE SPECIFICATION AND DRAWINGS ARE TO BE CONSIDERED IN THE CONSTRUCTION OF THE DOCUMENT.

Much of the time of our courts of law is occupied with the construction or interpretation of written instruments which limit or define the rights of parties to them. Experience shows that, while they are valuable preservers of the rights of suitors when correctly drawn, they become oftentimes sources of injustice and of much unhappiness when inefficiently executed. This is especially the case when the subject-matter of the instrument is an invention, perhaps intricate in its details and needing an accompanying model to be properly understood. The omission of a colon or semi-colon; the improper joining, or improper separation of sentences, may overthrow all the golden results which long years of patient toil by some industrious inventor, may have made reasonably certain of realization! And yet there must be a correct method of writing specifications; and when an instrument, whatever its nature may be, is erroneously drawn, judges must say so, and the parties *must* suffer the consequences. If this were not the case, parties who really have their papers properly made out would be no better off than they who have them ever so bunglingly executed. Suffering for this cause is the penalty which men pay for their negligence, either in employing poor agents, or in attempting to do for themselves what the experience of the world has proved to require the skill of a professional man to properly manage. There are some men whose vanity is so sensitive that the mere idea that they cannot accomplish anything that may be suggested, of whatever nature or character, is positively painful to them. We do not think that this peculiarity is any more common to inventors as a class than it is to professional men; but it is natural for men who have been successful in a particular calling, to imagine that their natural abilities will carry them safely through the difficulties that they are momentarily called upon to encounter in another, and to save a trifling sum they are led to make the attempt.

Letters Patent imperfectly drawn upon their face will often induce infringements, and although the courts may ultimately pronounce them valid when liberally construed, yet this imperfection is a temptation to parties, especially if the patent is valuable, to infringe upon it, and the patentee is consequently compelled to incur the expense of litigation in order to maintain his rights, These thoughts have been suggested to us by the case of Kittle v. Merriam. This case grew out of an original imperfection in the plaintiff's specification, and proves not only what we have just remarked; but it maintains the principle (favorable to inventors) that, in construing the language of a claim in Letters Patent, the *entire* specification and drawing are to be examined, and if the drawing affords means to correct a mistake, the error does not avoid the patent. The action was for an infringement of Letters Patent granted to the plaintiff for an improved door fastening.

Justice Curtis, of the United States Circuit Court, upon the construction of the specification, said:—"I disclaim altogether, the power to correct a mistake in Letters Patent. The power to do this is confided by Congress to the Commissioner of Patents. My duty is to *construe* the specification and claims as they stand and determine the legal effect of the claim. In doing this, one material thing to be adverted to is, what was in point of fact the invention? For there is a reasonable presumption that the *intention* of the inventor was to obtain, and the government to concede to him, the exclusive right to what he actually invented. Now it is conceded that the brace C, with its lip G, are essential parts of the invention; and it is therefore fairly to be presumed he intended to embrace them in his summing-up. Still he may have failed to do so, and we must look at the language employed and see whether he has or has not included these parts in his summing-up. Referring to the terms used in the claim, it is not doubtful that the patentee intended to include in his combination the lip G. He says so in express terms. No doubt exists on this subject. The doubt arises from the terms employed to show *how* the lip G, is to come into the combination. Taken by themselves, the words and letters of a part of the claim indicate that the rest B has two lips, F and G; and that the lip G, enters into the combination as part of the rest B. But, in construing a claim we cannot look to a single phrase only, to the exclusion of all the residue of the writing. On the contrary we must look at the entire specification and drawings, and view each part by the light thrown on it by the whole. If the specification taken as a whole leaves us no reasonable doubt concerning the intention of the patentee to include in the combination claimed, the brace and its lip G, then it is to be considered as included. It has already been stated that even the words of the claim relied on by the defendant show that the lip G enters into the combination; and the close of the claim also shows that the parts of which the combination consists are to be combined and arranged, that is, introduced into the combination, substantially as is described. And the descriptions and drawings clearly show that the lip G, is to come into the combination as part of the brace C, and that it is only in that way it can possibly be combined with the other parts. The case, then, is this: the lip G is to come into the combination—one part of the claim says, as one of the parts of B; another part of the claim, taken in connection with the residue of the specification and drawing, says it is to come in as part of the brace C. And no reasonable man can doubt that the latter and not the former is what the patentee intended."

Thus where the *intention* of the inventor can be gleaned from the Letters Patent themselves, the law will give effect to such intention; but it is not always that even the intention can be comprehended from them; and when this is the case the patentee is left without a remedy.

IMPROVED PLAN FOR GRADUATING THERMOMETERS.

From the mode of constructing thermometers, they have been very subject to imperfections which have rendered them inacurate in certain parts of the scale. The tubes are made by dipping the drop of glass from the crucible upon the end of the blow-pipe and a little cavity destined to form the bore of the tube is blown in the middle of the drop. The drop is then rolled into a cylinder some 5 inches in length, and the strip of colored glass being added, (when such is used) the tube is stretched down to the desired size, in the same way that molasses candy is stretched in working. These tubes are purchased by the thermometer manufacturers, The bulbs for the mercury blown upon one end, and the mercury introduced. Heat is now applied to the bulb and the mercury is expanded till it fills the tube, when the upper end is melted by a blow-pipe and hermetically sealed. Nature furnishes two invariable points of temperature for graduating the scale, the melting point of ice, and the boiling point of water. For the former it is only necessary to insert the bulb in ice water and when the mercury has had time to settle, the point is marked on the tube with a fine file. To ascertain the boiling point requires several precautions. As the temperature at which water boils depends upon the pressure of the atmosphere resting upon it, it will boil at a lower temperature, the greater its elevation above the level of the sea. And as the pressure of the atmosphere even at the same altitude, varies with the moisture which it contains, the comparative dryness of the air must be observed by the barometer. All proper steps being taken to avoid error, the bulb is inserted in boiling water, and the light of the column marked as before. By the French centigrade scale, the freezing point is called zero, and the boiling point 100, the space between the two been divided into 100 equal parts, called degrees. But Fahrenheit, whose division has unfortunately passed into general use in this country, imagining that he had found the absolute absence of all heat at 32 degrees below the freezing point, made his zero there, and reached the boiling point at 212.

In making the scales, each tube has its scale graduated for itself. The tube is laid upon the plate and the two marks of the freezing and boiling points are pricked upon the metal. The space between the two is divided into 180 equal parts, and a fine line drawn for each division or, as it is called, each degree; divisions of equal extent being marked above and below the freezing and boiling points for the whole length of the tube.

It will be seen that this plan will make all thermometers correct at the freezing and boiling points, and correct [illegible] between, provided the bore in the tube is of the same size throughout its whole length; but, unfortunately, this is seldom the case, as will readily be supposed from the mode of its manufacture. As the tube is rolled and stretched down from its original size, inequalities in the texture of the glass, and, in fact, many other causes, expand the bore in some parts and contract it in others, very seldom permitting one to be of uniform size throughout. The late Thomas Kendall discovered a very beautiful process for graduating the scales of thermometers to correspond in their several parts to the various sizes of the different parts of the tube to which they belonged.

The mode which we have described for making the tubes of thermometers is employed only in making a few standard instruments, which are then used by manfacturers in making the initial points on all the thermometers which they make. The process discovered by Mr. Kendall has been recently revised by his son, John Kendall, of Lebanon, N. Y., whose thermometers have obtained the very highest reputation among our men-of-science, and whose business is in consequence, growing with astonishing rapidity. By this process several points are taken from the standard thermometer to the one to be graduated, and an ingenius arrangement of the graduating machine causes the divisions on the scale to increase and diminish in accordance with the swells and contractions in the size of the tube. This machine could not be explained without diagrams, but on examination we are satisfied that it is calculated to produce a thermometer absolutely correct throughout the whole of its length.

AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "WEST POINT."

This steamer was constructed at Keyport, N. J., and has recently taken her appropriate position on the route of her intended service—New York to West Point. She is a well built and staunch vessel of her class; her dimensions are as follows:—Length on deck, from fore-part of stem to after-part of stern-post, above the spar-deck, 182 feet 6 inches; breadth of beam at midship section, above the main wales (molded), 27 feet; depth of hold, 8 feet 6 inches; draft of water at load line, 5 feet 3 inches; tunnage, 385 tuns. Her hull is of white oak, &c., and square-fastened with iron, treenails and large spikes. Distance of frames apart, at centers, 17 inches.

The *West Point* is fitted with one vertical, beam, condensing engine; diameter of cylinder, 40 inches; length of stroke of piston, 10 feet; diameter of water wheels, over boards, 27 feet; material of same, wood.

She is also supplied with one return flue boiler, located in hold; it possesses water bottom and was constructed with the design of attaining greater durability than is common in boilers of like size and pattern; in this the builders have been successful. She uses blowers to furnaces; has one smoke pipe, one bilge injection, and one independent steam fire and bilge pump. Ample protection has been made with tin, felt, zinc, &c., against communication of fire from boiler.

The cabins are on her spar deck and are very commodious. Bunkers for fuel, of wood; this vessel is well coppered.

Her value is about $45,000; owners, the Keyport Propeller Steamboat Company.

THE PROPELLER "F. W. BRUNE."

This steamer was constructed by Messrs. Harlan, Hollingsworth & Co., of Wilmington, Del., for the New York and Baltimore Steam Propeller Company, to ply regularly between those ports.

As she is claimed to be a very good vessel of her description, we herewith append the essential elements of her construction; they are as follows:—Length on deck, from fore-part of stem to after-part of stern-post, above the spar deck, 160 feet 3 inches; breadth of beam, at midship section, above the main wales (molded), 23 feet; depth of hold, 7 feet 6 inches; draft of water at load line, 7 feet, tunnage, 250 tuns. Her hull is of wrought iron plates, $\frac{1}{4}$ and $\frac{5}{16}$ths of an inch in thickness, and very securely fastened with rivets, $\frac{5}{8}$, $\frac{3}{8}$ths, $\frac{1}{2}$ and $\frac{3}{8}$ths of an inch in diameter, every $2\frac{1}{2}$, $2\frac{1}{4}$ and 2 inches.

The *F. W. Brune* is fitted with one vertical, direct-acting engine; diameter of cylinder, 28 inches; length of stroke of piston, 2 feet 2 inches; diameter of propeller, 8 feet; nnmber of blades, 4; material of same, cast iron.

She is also supplied with one return-flue boiler, loca-

ted in hold, and possesses water bottom; does not use blowers to furnaces; has one smoke pipe, no independent steam fire and bilge pump, no bilge injection, but bottom valves or cocks to all openings in her bottom. Ample protection against fire has been made.

This vessel has three athwartship water-tight bulkheads, also freight house on deck, which is inclosed, thereby protecting all merchandise from damage by storms. A very pleasant cabin is on the promenade deck. The machinery of this vessel was constructed by Messrs. Harlan, Hollingsworth & Co., as above.

As we have previously explained, vessels of this class have, until recently, been fitted with the "Loper propeller," a description of which will be found on page 71, Vol. III (new series) of the SCIENTIFIC AMERICAN. We believe this steamer is of this kind, but it lacks many of the advantages of a new propeller recently invented and manufactured in Buffalo, N. Y., which has of late been extensively introduced. The novelty of this late essay is that the wheel is lighter than the "Loper," and the pitch of the blades, which are four in number, can be changed whilst the vessel is afloat, and without taking up the screw. It will be readily observed that this enables the engineer to regulate the set of the blades to accommodate their angle to whatever draft and whatever capacity of producing steam he may have to deal with. It is really an important advantage, and it is being generally appreciated, as it is being adapted in nearly all the new propellers now being erected, and also those being repaired by changing the screw.

WORKING STEAM EXPANSIVELY.

MESSRS. EDITORS:—Your correspondent G. H. Reynolds on page 118, of the present volume of the SCIENTIFIC AMERICAN, speaks of his belief in working steam expansively, and requiring more proof to the contrary than the recent experiments at the Metropolitan Mills, in this city. Now, there were no stronger believers in "cut-offs" than the proprietors of the Metropolitan Mills, but they have found their error at a very great cost; and when any one who is foolish enough to believe in the economy of working steam expansively can point to one single experiment in the history of the steam engine as fairly tried at one of the mills and can show any saving, he will have some grounds for his belief and not otherwise. Here is more proof to the contrary, from an English work on the economy of fuel by T. S. Prideaux, (page 100):—"At a recent trial of one of Her Majesty's screw steamers constructed with 4 cylinders for the *express* purpose of better obtaining the economy due to a considerable extent of expansion, it was found that a better effect was obtained by using only two cylinders, and cutting-off at half-stroke, than by using the same quantity of steam in four cylinders and cutting-off at quarter-stroke, although the result in the latter case ought to have been 50 per cent more; the cause of this anomaly was obviously the greater proportional condensation of the steam in the four cylinders than by the two, and the result might have been predicted. The proprietor of an extensive manufactory has told me this very day, the result of the trial of a "cut-off" which he had on his engine; he said it made no difference, in the cost of the coal used, whether he cut off at one-seventh of the stroke or one-half stroke."

The Metropolitan Mills, in this city, have six engines working in pairs, one pair driving 7 run of 4 feet burr stones; another pair driving 7 more run, and one pair doing the rest of the work of a flouring mill, such as driving the elevators, coolers, bolts, cleaners, &c. The engines driving the stones were constructed expressly for that purpose by Henry Waterman, 239 Cherry-street, in the most perfect form for using steam expansively. They are 14 inches diameter of cylinder, and 3 feet stroke. The engines doing the other work are a pair made at the Novelty Works, of their usual pattern, some 12 years since for the Bridge-street mill, Brooklyn, and were used there til the mill was burnt down. They are 15-inch cylinders and 4 feet stroke. The valves on all the engines are the ordinary slide, with the cut-off valve on the back, each worked by an eccentric. The point of cutting-off is varied by hand. The experiments were as follows: The engines were run for 36 hours, on an even quality of wheat, with their usual arrangements, steam at 90 lbs. pressure in the boiler, and cutting-off at 1-5th to 1-6th of the stroke. The amount of wheat ground and flour made, and coal used, were correctly noted. One engine was then taken off from each pair, and the cut-offs from the other engines, and a 36-hours experiment with the same kind of wheat made; the steam was at the same pressure in the boiler, following as near as possible the full length of the stroke, and running at the same speed. The wheat ground and flour made was the same, with 10 per cent less coal, which was quite contrary to the received "notions"—a positive gain by using the steam the full length of the stroke over using it expansively. The stones were sharpened as often in one case as the other. The condenser was not used at the time of the above experiment.

WARREN ROWELL.

New York, August 25, 1860.

TELEGRAPH BETWEEN THE ATLANTIC AND PACIFIC STATES.

The Secretary of the Treasury has advertised for proposals for building the line of telegraph to the Pacific, from the west line of the State of Missouri, by any route which the contractors may select (connecting at such point or points by telegraph with the cities of Washington, New Orleans, New York, Charleston, Boston, and other cities in the Atlantic, Southern and Western States) to the city of San Francisco, in the State of California. The bids are required to conform to the Act of Congress passed at the late session, which limits the compensation to $40,000 per annum, and prevents the public from imposition by limiting the charges for dispatches over said Pacific telegraph to 30 cents per word, with "the usual proportionate deductions upon larger dispatches." And it is further provided that this contract shall not prevent the building of other telegraph lines to the Pacific.

The bids or proposals were opened on the 2d of last month, at Washington, and no doubt considerable excitement is felt among those personally interested in telegraphic enterprises. The parties who control the American Telegraph Company are the owners of all the patents now in use to facilitate telegraphic communication, and must be reconciled before any contract can go into effect. There is another obstacle that will have to be overcome before messages can be sent through to the Pacific. On the California end of the route there are two separate companies now working their way with the wire in hand towards the east. One company has extended its stations far into Carson valley; the other, by this time, is working as far south as Los Angelos, 480 miles below San Francisco, on the line of the Overland Mail route. Whichever route is decided upon by the successful contractors, the line already built will be in the way, unless allowed a share in the enterprise. The same difficulty surrounds it on the east. Without perfect harmony between the bidders and the present telegraph companies no telegraph can ever be worked; but all these difficulties may, and no doubt will be removed, and mutual agreements made between all parties.

THE DISTRIBUTION OF CURRENCY.—A correspondent of the New York *World* says:—"It has been estimated that the currency required in the United States does not ordinarily exceed $9 per inhabitant, of which, at the utmost, only one-quarter is in coin. In England, it amounts to $28, of which one-third is in coin; whilst in France it is probably double the first-named sum, the largest portion being in coin." On the 4th ult., the liabilities of New York were:—Deposits, $83,846,988; circulation, $9,176,386; total, $93,023,374. The assets were:—Loans and discounts, $130,118,247; specie, $22,128,189; total, $152,246,436. The specie is a reserve to fall back upon in a case of emergency; but not a fund to meet the aggregate indebtedness of the banks.

PLATINIZING RIFLES.—A correspondent of the London *Mechanics' Magazine*, gives the following receipt for preventing rifles rusting in the interior of the barrels. "If nitro-muriate of platina be mixed with one-fourth of its bulk of ether, and the mixture then allowed to settle, the platina solution will fall to the bottom, when the lighter liquid may be poured off. The platina solution is then poured into a well-cleaned rifle barrel, when a galvanic action quickly takes place, and a thin coat of platina is deposited upon the surface of the barrel, and prevents it from rusting."

A COLUMN OF VARIETIES.

The bells of the Paris ornamental clocks are composed of 72 parts by weight—copper, 26.55 tin, and 1.44 iron.

The sulphate of barytes is the substance which is employed for giving that beautiful white glossy surface to card and other papers.

Hard iron when melted and cast in large masses, and then allowed to cool very slowly, becomes quite soft. Large castings of iron should be so constructed as to be cooled rapidly by a stream of water or a current of air passed through the center of them.

The annual gold product of Australia, since the first discovery of this metal in 1851, has been as follows:—1851, for five months, 145,145 ounces; 1852, 1,974,975; 1853, 2,497.723; 1854, 2,144,699; 1855, 2,576,745; 1856, 3,003,811; 1857, 2,729,655; 1859, 2,516,976. Total for the eight years, 17,589,729 ounces, valued at £4 per ounce. Total value, £70,358,916, or $340,535,153.

Some of the heavy engines for drawing on common roads in England are called "steam elephants." One of these lately built at Birkenhead for the Dutch government draws a load of 40 tuns on a level. It is provided with one of Gwynne's American centrifugal pumps to lift water, and it has also a common force pump, so that it may be used as a steam fire-engine when required.

In one of the libraries in Newark, N. J., there are a number of drawings formerly belonging to Robert Fulton, and executed by himself. These embrace diagrams of his submarine torpedoes. One of them represents the English channel sown with 190 marine torpedoes, so anchored as to destroy any French fleet that would attempt to invade England. The British government refused to entertain Fulton's propositions for protecting their coast.

Within the past three years, 10 barks, 5 brigs, 41 schooners, 1 propeller, and 8 tug-boats, which were built on the inland lake waters, are now employed in salt water service in our coasting trade. From their flat build they make excellent cotton traders, and large numbers of them are engaged in that branch of sea service.

An important improvement in some classes of plated goods, lately introdnced, consists of solid rolled silver edges, beads, and moldings, instead of plated ores, which from their prominence have their silver surface speedily worn off. The silver employed in forming the ornamental edgings is laminated exceedingly thin.

One drop of the essence of bitter almonds will communicate an agreeable taste and smell to an ounce of the castor oil of commerce, and will not at all affect its medicinal action.

The American steamship *Vanderbilt* has proved herself to be the fastest sailer afloat. She sailed from New York July 28, at 2.30 P. M., and arrived at Southampton Aug. 6, at midnight. Allowing five hours for the difference of time in sailing eastward between the two ports, making 9 days and 4 hours, the fastest voyage on record.

Copper mines have been discovered in British Columbia, in which large blocks of the pure metal, similar to those obtained in the mines of Lake Superior, have been found. These blocks are said to be very numerous. Silver is also found in considerable quantities in these mines.

Dr. Wollaston obtained very fine platinum wire by inserting a platinum wire in a small cylinder of silver, then drawing them both through a draw plate, after which the silver was melted, leaving the platinum wire finer than the thread of a spider's web. Silver wire may be drawn to the three-hundredth part of an inch in diameter, and platina to the three-thousandth part of an inch.

On the Lexington and Danville Railroad, in Kentucky, Mr. J. Roebling is engaged in constructing a suspension bridge, which will form a span of 1,224 feet, from center to center of towers over a chasm 300 feet deep. When completed, it will be the most stupendous work of the kind in the world.

Two of Fawke's steam plows are now being constructed in Philadelphia for Cuba for the purpose of being used on tobacco plantations.

In Philadelphia, there are now in actual running order nineteen passenger railway companies, with 395 cars, 2,744 horses, and 1,623 men employed. There are 160 7-40 miles of single track.