

axle, no speed reduction being used. The water tank at the front has a capacity of 20 gallons. Directly behind it is the horizontal steering wheel, which is connected, by a system of universally jointed levers, with the steering arms of the front wheels. The exhaust pipe of the engine can be plainly seen curving around and protruding out back of the rear seat. The throttle and brake levers for controlling the car are also distinctly visible. Mr. Cannon built his racer with stock parts obtained from several automobile jobbers, and the fact that the results obtained with it were so satisfactory, speaks well for the material some of these firms are turning out. For a purely amateur construction, the machine has accomplished more in the way of record breaking than any other that has as yet appeared.

Coming now to the racers of the gasoline type, that built during the past year by Mr. Henry Ford, of Detroit, Mich., is one of the most striking examples of the latest tendency in racers. This machine, like Cannon's, was built as simply as possible, and without regard to appearance, the utilization of power to the best advantage being the chief aim of the builder. In order to accomplish this the differential gear has been dispensed with, and the motor drives the rear axle direct through bevel gears, with a speed reduction ratio of four to five, a 28-tooth bevel pinion on the main shaft meshing with a 35-tooth bevel gear on the rear axle. There are no change speed gears, but simply a flywheel clutch of the usual type, for disconnecting the motor from the wheels. These are stout wire ones, 34 and 36 inches in diameter, front and rear respectively. The wheel base of the car is 9 feet, 4 inches, and the tread 4 feet, 8½ inches. The main frame is made up of two 1½ x 4-inch side bars of white ash, lined with ¼-inch steel plate, and bound together by three similar cross bars and two others of 4-inch channel iron, which support the motor. The side bars are trussed with steel rods, and the frame is braced laterally by a similar truss connecting the lower ends of the two steering knuckles. The frame is supported upon two semi-elliptical springs at the front end, but rests simply upon the bearings of the rear axle at the back. The motor used to propel this car is a vertical one having four 7 x 7-inch cylinders, cast integral, with cylinder heads and exhaust valve chambers thoroughly water jacketed. A separate exhaust pipe for each cylinder, with an area equal to that of the exhaust valve, conveys the burnt gases into the atmosphere. The inlet valves are automatic, being opened by the suction of the pistons only, and closed by a spring. A 2¼-inch gas supply pipe, connected to a single mixing valve, feeds all four cylinders. The gasoline tank for supplying this mixing valve is situ-

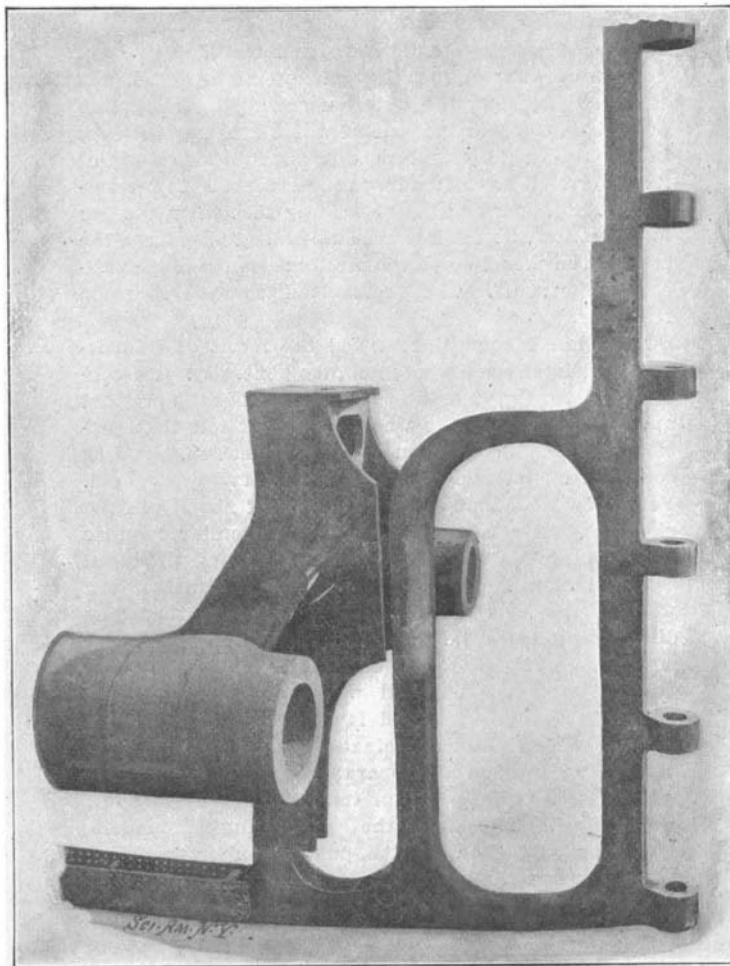
ated on the left of the engine. The water tank is under the driver's seat. The water is circulated by a gear-driven centrifugal pump, through 64 brass pipes, ¼-inch in diameter and 26 inches long, mounted on the front of the car. No radiating ribs are used. The crank-shaft of the motor is mounted in rigid bearings and is not incased, save for a tin cover hung

shaft has no universal joints, but is rigidly aligned with the crank-shaft, and carries a sleeve bearing the clutch upon it.

The ignition outfit consists of a battery of five accumulators, which supply current for four Rhumkorff coils. A suitable commutator switches the primary current to the proper coil for each cylinder. The spark-lead-controlling lever is at the right of the driver's seat, while on the left of his seat is a thumb wheel for regulating the supply of gasoline. The clutch pedal is located in the center of the foot box, directly in front of the operator; another pedal on the left of this box governs the throttle valve; and a third pedal, on the right side, puts on the brake. The vertical steering post has a 28-inch cross arm, with vertical handles at each end. This arm is so connected to the steering arms of the front wheels as to give a leverage of four to twelve.

The Ford racer made a record (unofficial) of a mile in 1:01 1-5 on the Grosse Point track, Detroit, December 1, 1902. Its builder thinks it capable of still faster time than this, however; and, in the near future, hopes to make an even better record. The machine is looked upon as one of the possible competitors for the Gordon Bennett cup.

The Winton "Bullet" is similar in many respects to the machine just described. Its best track records were the mile in 1:02¼, on the Glenville track, Cleveland, September 16, 1902, and ten miles in 10 minutes, 50 seconds. The machine is no longer in existence, but its indefatigable builder is busily engaged in constructing a new and still faster one, in which he will return to the use of his well-known horizontal motor. The new machine is already entered in the international cup race of 1903. Several other manufacturers throughout the country are building special machines, and, after a number of trial races have been held, the best three racers will be chosen to represent America in the contest next summer.



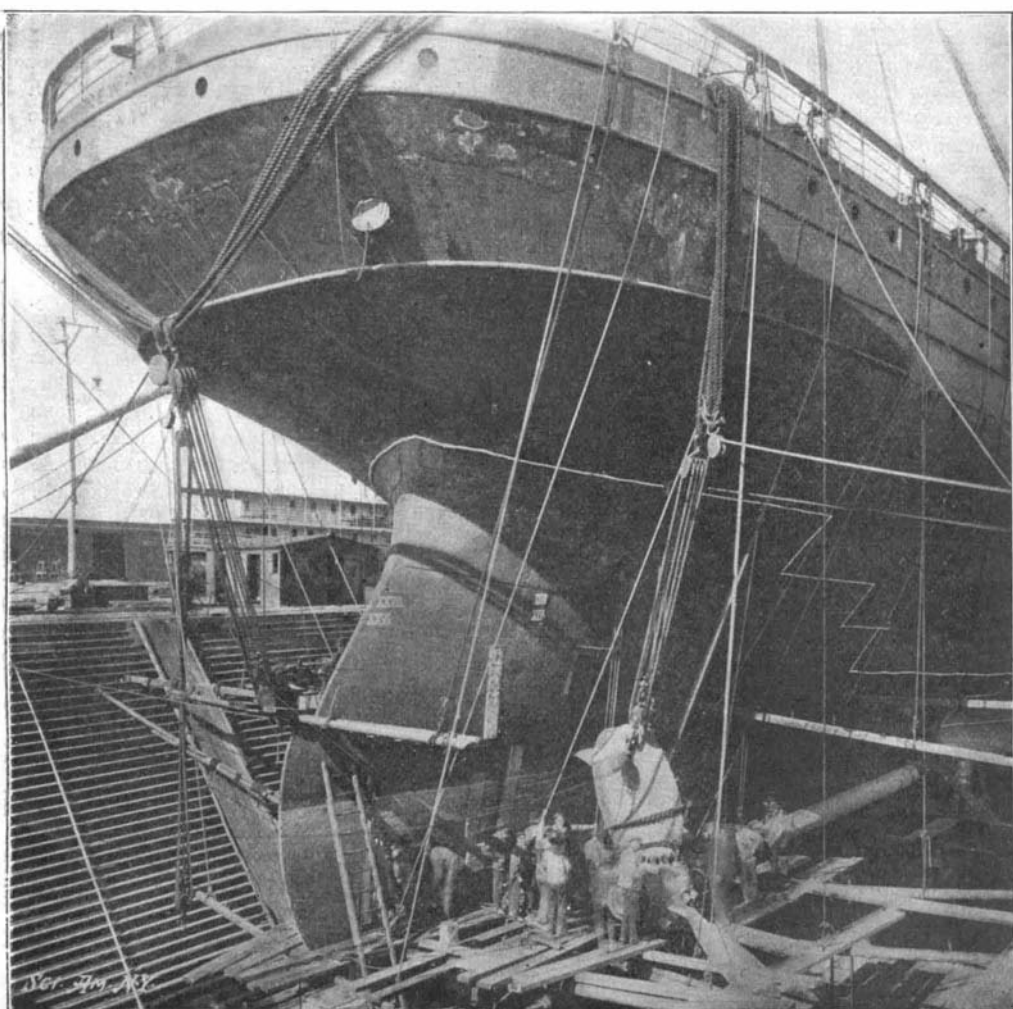
THE STEEL CASTINGS FOR NEW STERN OF STEAMER "NEW YORK." SPECTACLE FRAME, 38 TONS; STERN FRAME, 32 TONS.

Shown as assembled ready for plating in.

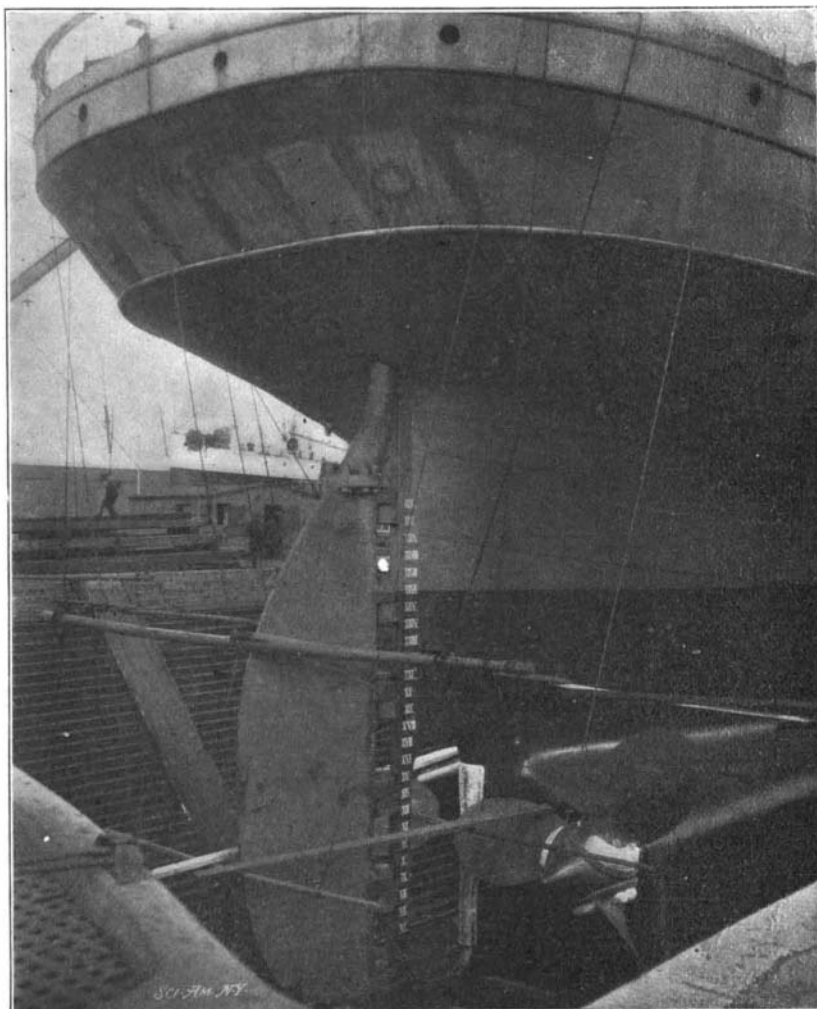
beneath it to protect it from dirt and dust. The two center cranks are opposed to the two end ones, and an explosion occurs every half revolution in cylinders 1, 2, 4, and 3 respectively. On the end of the crank-shaft toward the rear of the car, keyed and fitted on a taper, is a 230-pound flywheel, 23 inches in diameter and 6 inches wide. A wooden block clutch is expanded, by means of levers, against the inside rim of the flywheel, thus locking the main driving shaft to the crank-shaft of the motor. The former

RECONSTRUCTION OF THE STEAMSHIP "NEW YORK"

There has lately been carried through at the Erie Basin drydock, Brooklyn, a most important work of reconstruction on one of the notable steamships of the world, the "New York" of the American Line, formerly the "City of New York" of the Inman and International Line. This vessel, with her sister, the "City of Paris," now the "Philadelphia" of the International Navigation Company, was built in 1889 and was the first of the modern, twin-screw, high-speed, transatlantic liners. The two vessels broke the transatlantic record early in their career, and were about as famous a pair of ships as were ever seen on the high seas. After their transfer-



THE OLD STERN AND BALANCED RUDDER OF THE "NEW YORK" BEFORE RECONSTRUCTION. The white line on plating shows the portion which was rebuilt.



THE NEW STERN, PROPELLER SHAFT HOUSING, AND RUDDER COMPLETED.

to the American Line, now incorporated in the International Navigation Company, they were named the "New York" and the "Paris." They were in active service during the Spanish-American war as government scouts, work for which their large coal capacity and high speed rendered them very serviceable. Shortly after the conclusion of the war, when they were again in the Atlantic service the "Paris" ran ashore on the south coast of England and remained on the rocks for several months. Ultimately she was floated by a German salvage company, and taken to an English ship-building yard, where her bottom, which had been badly broken up, was entirely rebuilt, the hull generally strengthened, and new engines and propellers put in place, the old triple-expansion engines being replaced by modern quadruple-expansion engines, and new batteries of boilers, carrying much higher boiler pressures, installed. The vessel was re-named the "Philadelphia," and as the result of these changes, not only has an additional knot an hour been added to the speed, increasing it from a sea speed of 19 to 20 knots, but the increased speed has been gained with a considerable reduction of coal consumption.

About eighteen months ago the sister ship "New York," which forms the subject of our illustration, was taken in hand by the John N. Robins Company at the Erie Basin drydock, Brooklyn, for a similar overhauling and reconstruction. By the courtesy of Mr. W. D. Dickie, the general manager, we are enabled to present the accompanying illustrations and particulars of this interesting work. Two of our illustrations show the structural changes which have been made in the stern and propellers of the ship, one of them representing the vessel when she was first put in drydock, and the other being taken when the work was completed, and shortly before the vessel was floated. The first step was to remove the plating and frames over that portion of the hull which is indicated by the zigzag white line in our engraving. It will be seen that, as originally constructed, the vessel was fitted with a balanced rudder, which was carried entirely below the water line, the sternpost being built out astern and the structure of the ship being here swelled out to admit the rudder head and permit the placing of the steering gear within the swelled-out portion and below the water line; this being done because the vessels were built with a view to use by the British government as armed cruisers, the government requirements calling for below-water steering gear. After the removal of the plating and framing the heavy steel castings of the spectacle frame and the stern frame, weighing together some 70 tons, were put in place; the frames which, in their lower portion, were curved out to form the housing for the propeller shafting, were set up; the structure was plated in; the massive rudder, which is a single steel casting, was hung; the rudder head bolted on; and the job, as far as the stern was concerned, was completed. Under the old arrangement the tail shafts were exposed, and their weight and that of the propellers was supported on heavy shaft-brackets, a system of construction which was in vogue when the vessels were first built. Now, as will be seen from the engraving, the shafting is completely inclosed up to the propeller hubs, and a much stronger construction is secured, while the shafting is protected from the water, and may be at any time inspected from the interior of the ship. Each propeller-hub weighs 13,500 pounds, and the three blades weigh 28,300 pounds.

At the same time a vast amount of new steel work was built into the hull itself, the total for the whole ship reaching 2,200 tons. The hull was carefully gone over, and the butt straps were replaced by new ones. An entirely new engine foundation was constructed, the arrangement of the decks was altered, some of them being almost entirely rebuilt, and new water tanks were put in. The new propellers, it should be mentioned, are placed one foot six inches nearer to the center line of the vessel than the old propellers. They are also somewhat smaller in diameter, and a higher rotative speed will be used with the new quadruple-expansion engines. At the completion of the repairs the vessel was floated out of drydock and towed to the Cramp's shipyard, Philadelphia, where the engines and boilers will be installed. It should be mentioned that when she leaves the Cramp's yard she will differ materially in appearance from the old "City of New York," the three funnels which were a conspicuous feature in the vessel being removed, and two single funnels of greater height being put in their place. It is interesting to note that this is considerably the largest job of the kind ever undertaken at the port of New York, and its successful completion serves to indicate the material progress that is being made in shipbuilding construction in this neighborhood.

Charles L. Murray, a San Francisco fireman, has a claim against the city for the use of a draught-regulating device for use on vehicles which are drawn by three horses. The City Attorney has rendered a decision supporting his demand for remuneration. The apparatus is in general use in that city.

## Legal Notes.

**NEW COMBINATION OF OLD ELEMENTS.**—A suit was recently brought by the Emerson Electric Manufacturing Company against the Van Nort Brothers Electric Company (116 Fed. Rep. 974) to restrain the infringement of certain claims of letters patent for an improvement in lubricating bearings designed especially for use in connection with electric ceiling-fan motors. The usual defense of want of novelty and non-infringement was set up. The patent in question covers a combination of devices, the principal one of which is a spiral groove in the hub of the armature, opening into an oil-cup at its lower end, and extending up the bearing to a reservoir at its upper end in such a way that when the fan is in motion the oil is forced up the groove from the cup on the principle of the Archimedean screw, lubricating the shaft. The excess is discharged into the reservoir.

Defendant's counsel conceded the merit of this device and likewise its patentability generally. He contended, however, that the patentee was not the original and first inventor. It was this contention that presented the main question for determination. It was conceded by the court that the elements were all old. Yet it was held that despite the lack of novelty in the elements, their combination in the peculiar manner provided for by the patentee was new and produced a useful result. The court proceeded to analyze the patents cited by the defendants and showed that they did not anticipate the patent under which complainant manufactured. The court cited the case of *Bates vs. Coe* (98 U. S. 31, 48), in which it was remarked: "Where the thing patented is an entirety, consisting of a single device or combination of old elements incapable of division or separate use, the respondent cannot escape the charge of infringement by alleging or proving that a part of the entire thing is found in one prior patent or printed publication or machine, and another part in another prior exhibit, and still another part in a third one, and from the three, or any greater number of such exhibits, draw the conclusion that the patentee is not the original and first inventor of the patented improvement."

The invention under consideration is the combination in one device of elements alleged to have been all shown by prior patents so as to produce a new and useful result, or at least to produce the old result in a more facile, economical and efficient way. If the combination produces such results by the joint and cooperative action of the elements combined, even if they are old, it is invention within the meaning of the patent law, notwithstanding the fact that each of the elements separately considered, or in other combinations, were old and well-known in the art.

The record in the case showed that considerable progress had been made in the art of lubricating vertical shafts before complainant's patent was granted. One inventor had discovered the utility of the revolving oil cup; another had discovered the utility of the ball-bearing; another had discovered the utility of the spiral groove; and these different elements had been separately employed, or one had been combined with another in such a way as to produce certain results. But in the court's opinion no one had discovered the combination covered in the claims in this case, prior to complainant's patent. That patent gave the finishing touch to former crude beginnings. The inventor brought success out of comparative failure, produced a combination not only practically new in itself, but produced new and very beneficial results. A decree was entered for the complainant.

**THE WESTON ELECTRICAL INSTRUMENT CASE.**—The Weston Electrical Instrument Company brought an action in equity against J. F. Stevens and Elmer P. Morris of the Keystone Electrical Instrument Co. to restrain the alleged infringement of letters patent granted to Edward Weston for electrical measuring instruments. Judge Coxe in the United States Circuit Court of the Southern District of New York, before whom the case was heard, gave it as his opinion that there were certain fundamental propositions which, if not admitted, could not be successfully disputed. Mr. Weston was the first, he thought, to make a successful commercial voltmeter for measuring alternating currents.

Strictly speaking, there was no prior art. If the invention be confined to alternating current devices, it can be said with confidence that there were no practical commercial instruments prior to Weston's. Hence, there were no instruments entitled to be considered as anticipations. There were two or three instruments which, as scientific possibilities, could, it is true, reach accurate results; but as every-day working devices they were of little value. The most satisfactory of these were, perhaps, the Thomson balance, invented by Lord Kelvin, the Siemens dynamometer, and the Cardew hot-wire voltmeter. There

were other instruments, but they were no nearer to the invention than those referred to. As Judge Coxe expressed it, "they have about the same relation to the Watson device as a medieval crossbow has to a modern repeating rifle." In the Court's opinion, infringement was clear. The defendants copied the patented instrument even in its minute details. The only difference entitled to notice is the substitution of a V-shaped spring for the upper flat spiral spring of the patent. The two springs are unquestionably equivalents. This was a case where upon undisputed testimony the inventor had accomplished something which has been of unquestionable benefit. "In an art crowded with indefatigable and brilliant enthusiasts, he has made the only successful alternating current voltmeter in use at the present day." The claimant was granted the usual decree for an injunction and an accounting.

**LIMITATION OF CLAIMS BY LANGUAGE USED.**—In delivering his opinion in the case of *Schreiber and Conchar Manufacturing Company vs. Adams Company* (117 Fed. Rep. 830), on appeal, District Judge Lochren showed how claims should be construed and limited. The subject matter in dispute was the validity of the Farwell patent for an adjustable stove-damper. The evidence showed that the business of making adjustable stove-dampers, to be used in repairing stoves and renewing disabled dampers, was so considerable that many devices were invented and in use, some of which were patented. In all, the object was to provide a damper which, without the exercise of special skill, could be fitted and adjusted to any ordinary cooking stove. The Farwell patent was granted for its peculiar combination of constituent parts. These parts separately considered were old. Prior patents showed in many respects similar devices, but the Farwell patent was limited, not only by the prior art, but by the specific language of its claims, to a damper with a rod having two grooves in it, one on each side, extending nearly its entire length. The damper invented by Ohnemus and Sanner, and made by the defendant, performed the same functions as the Farwell device and in substantially the same way. The defendant's rod had no groove in it. It may be that Farwell's invention would have entitled him to take a broader claim than he did; but his patent makes no such broad claim. The language employed in the Farwell patent, as well in the specifications as in each of the claims, makes the rod of the peculiar form described, with two grooves an important and essential part, or the element of his combination. The defendant did not use a rod with grooves and was therefore held not to have infringed.

**CONTRIBUTORY INFRINGEMENT.**—The case of *Palmer vs. Landphere* (118 Fed. Rep. 52) is interesting for the example which it contains of contributory infringement.

The letters patent, upon which the suit was based, were two, issued on December 9, 1884, to Frank L. Palmer and William H. Palmer for quilting machines. The defendant contended that after he had left the employ of plaintiffs he had a right to enter the employ of a rival and to equip its plant with the patented machines. He further maintained that he could continue shifting his employment, and in each case of new service furnish his personal knowledge in defiance of the patents sued upon. The Court found that the defendant was without question selling the different articles which entered into the construction of the infringing machines, at a profit.

During his original employment he learned the details of the quilting business, and with that knowledge he went forth into the world. Starting with a place of business of his own, the Court found that he left marks of his unfair methods behind, in various places. The Court declared that he was retailing at a profit separate parts of an infringing machine which he was employed by the purchaser to set up, and cannot avoid liability as a contributory infringer on the ground that he was merely selling his labor as a skilled workman.

The Patent Office has decided that President Roosevelt's name should not be used as an advertising trademark. In the opinion of the Commissioner of Patents a living celebrity is entitled to protection from the use of his name for the purposes of trade by others, and this is specially true in the case of the President of the United States.

**ORAL AGREEMENTS TO SELL PATENTS.**—In the case of *Cook vs. Sterling Electric Company* (118 Fed. Rep. 45), District Judge Baker held that an oral agreement for the sale of an invention, founded on a sufficient consideration, made pending an application for a patent, is invalid in equity and constitutes a good defense to a suit in equity, for infringement, brought by the inventor against the purchaser, after the issuance of a patent.