

THE GRAYHOUND.

The grayhound is one of the tallest of the canine race, growing commonly to the height of about thirty inches, but sometimes exceeds this by ten or twelve inches. The legs being long and muscular, the abdomen contracted, and the loins strong, the dog has advantages over any other kind for speed and endurance. His jaws are elongated so that he may seize his prey when at full speed; his neck is long so that he may lift his head high for sighting game, and he is as remarkable for his keenness of vision as the bloodhound for his scent.

Representations of the grayhound are to be found on the oldest Egyptian monuments, and the breed is supposed to have originated in Western Asia. The color and fur of the animal have been much varied by climatic influences. The English grayhounds, kept for centuries for the sport of coursing, are the fastest of the species, and their hair is moderately smooth, the colors being black, slaty gray, or fawn. The power of following game by scent is entirely absent in the English dog; while the Scotch grayhound (probably somewhat crossed with a deerhound) is remarkable for its keenness of nose. The Irish grayhound is very strong, muscular, and courageous, and will generally come off best in a combat with a wolf.

In coursing, it is usual to match two grayhounds against each other, and they are fastened by their collars to a leathern thong, with a snap hook operated by a string. Boys go into the field, and beat the grass or other crop with long sticks; a hare gets up and runs. The starter, when the hare has attained some distance, pulls the string of the leash, and away go the dogs, side by side and close together, with the speed of the wind. The hare would soon be run down were it not for its remarkable facility for suddenly doubling on its pursuers; and it will execute this maneuver so rapidly as to run right past the dogs and away in the contrary direction before they can turn to catch it. But the superiority in endurance of the grayhounds in time wears out the hare, and the fleetness of the two dogs will surely catch it at last, killing it instantly by one squeeze on the ribs with its long and powerful jaws.

THE KAGU.

New Caledonia, in common with other countries lying in the South Pacific Ocean, contains a variety of ornithological species, peculiar to that region of the globe, and, besides, remarkable for the beauty of their colors and the singularity of their forms. A number of curious birds have, of late years, been transported from the colony above named, and confined in the various zoological gardens of Europe, where their habits have been carefully studied by naturalists. Among the specimens which quite recently have been added to the *Jardin des Plantes*, in Paris, is the kagu, or *rhinoceros jubatus*, a representation of which we have reproduced from the pages of *La Nature*. The bird presents the characteristics of the herons in general appearance, but careful study of its osteology has resulted in its proving to be a species of crane.

The plumage, during life, is of a soft grayish blue, but after death changes rapidly to a dirty yellow. The beak is long and curved, and, with the claws, is of a bright red. The plumes of the neck and breast are rather short; but as if to make up for this deficiency, these on the posterior portion of the head are long enough to form a hump, which the bird can raise or lower at will. The tail is poorly developed and the wings are ill formed and short. The pin feathers are streaked with white and covered with bands of black and brown. The size of the body is about that of a chicken, and its conformation shows very plainly that the bird cannot support itself in the air but for a very brief period.

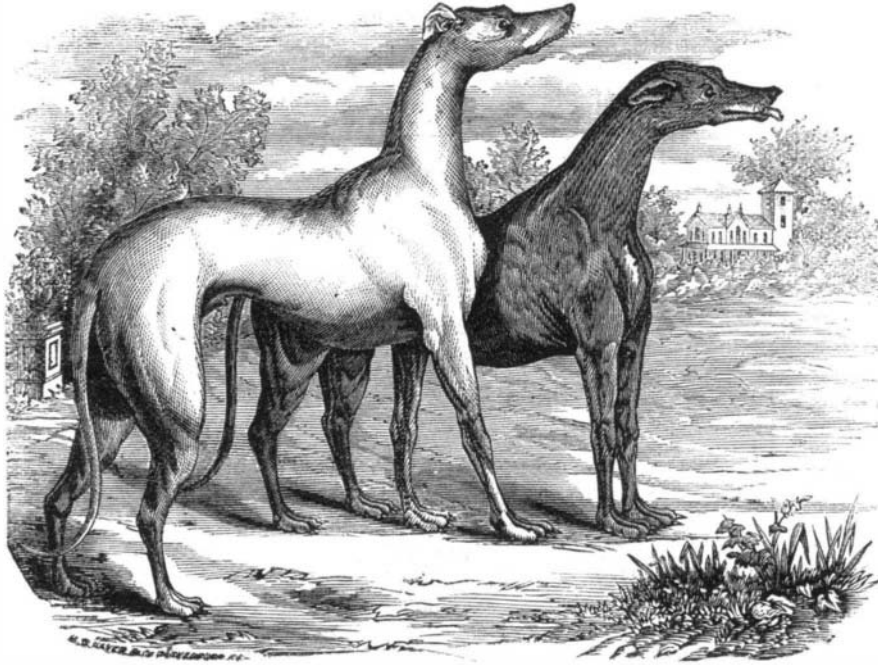
The kagu is easily tamed, and even in its native state will follow the plow to pick up grubs and earth worms, as readily as the crow. In its habits it resembles the rails, especially in approaching prey, when its serpentine and brusque movements of the neck and body closely resemble those of that class of birds. The hen lays two eggs, but conceals them with great care.

Measures are to be taken to acclimatize the kagu in France, as a protection to farmers against insects; while its present rapid rate of disappearance in New Caledonia will probably result in the careful guarding of the species in that colony.

BATTERY carbons can be readily cut with a handsaw moistened with water.

The Great Pen Maker.

At the recent ceremony of laying the foundation stone of the science college which he is about to give to Birmingham, Eng., Sir Josiah Mason said: "The trade of steel pen making, I have now followed for more than forty-seven years until I have developed the works into the largest pen factory in the world. This business and that of the split ring making were my sole occupations until 1840, when accident brought me into close relations with my late valued friend and partner, Mr. G. R. Elkington, who was then applying the great discovery of electro deposition; and through my association with him in this undertaking I may claim a share

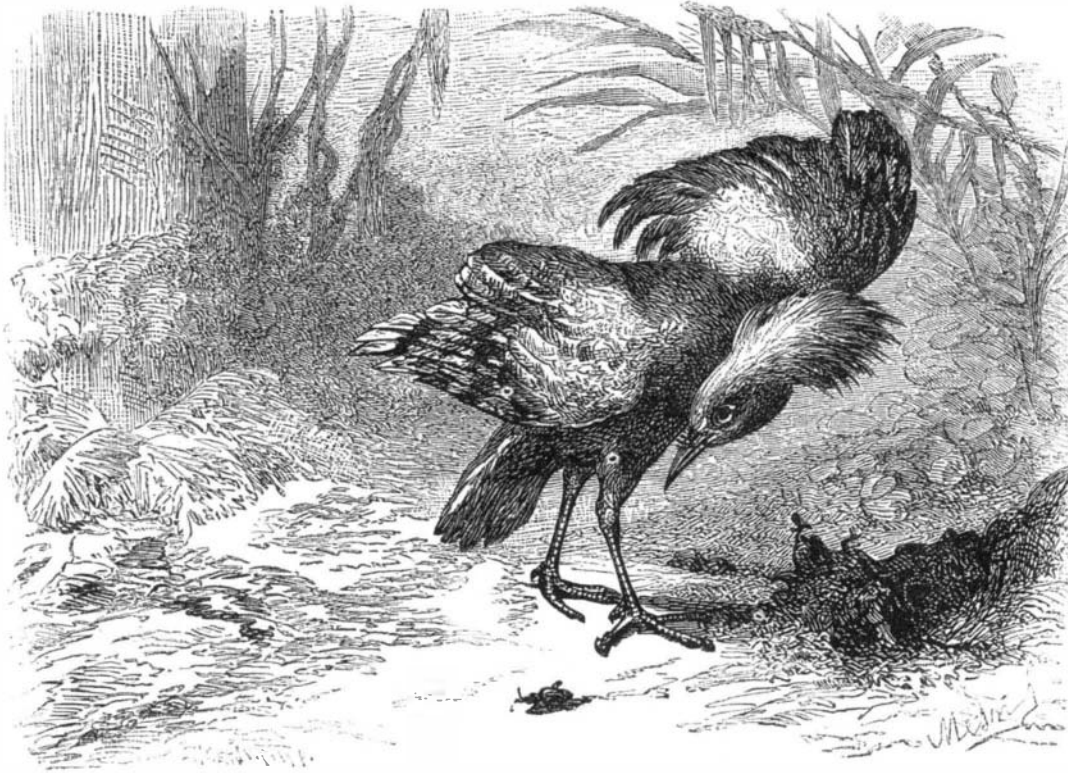


ENGLISH GRAYHOUNDS.

in the creation of a form of scientific industry which has so largely enriched the town of Birmingham, and increased its fame throughout the world. I mention these facts to show you how the means with which God has blessed me have been acquired, and to show, also, how natural it is that I should wish to devote some portion of those means to assist in promoting scientific teaching to advance the varied forms of scientific industry with which, throughout my Birmingham life, I have been so closely connected."

Paint for Shingle Roofs.

A correspondent of the *New England Farmer* says: "In regard to shingles, I have seen the highest cost shaved pine fail in ten years; and I expect the cheapest, sappy, sawed



THE AUSTRALIAN KAGU.

pine will last that length of time. Roofs are so expensive to keep in repair that it behoves every man who has had experience with them to contribute what he can for the general good on this all important subject.

In the future I intend to lay low priced shingles—say from \$2.75 to \$4 per thousand—and paint them with a coat of tar and asphaltum—say one barrel coal tar, costing \$3; ten pounds asphaltum at 3 cents, 30 cents; ten pounds ground slate at 1 cent, 10 cents; two gallons dead oil at 25 cents, 50 cents, which should be added after the other has been wetted and thoroughly mixed.

I consider the above mixture as good as anything that can be put on to shingles, as it will thoroughly keep the water out; and if dry they will not rot under the lap, nor will the nails rust, and I know of no reason why they will not last as long as I shall want shingles. The mixture should be put

on hot, on a dry day, and upon a dry roof. Ground slate or asbestos is fireproof; so, also, is the tar, after it has dried thoroughly. The last shingles I had cost \$2.75 per thousand; laying, \$1.75 per thousand; nails, 25 cents per thousand; paint, 12 cents per thousand, and I now consider it as good as any roof I ever had or saw."

Street Pavements.

In a paper read before the Edinburgh and Leith Society, Mr. J. H. Cunningham describes very ably the relative merits of the various kinds of street paving used in the cities of Great Britain, namely, the Macadam, Telford, granite block, asphalt, and wood. He says:

On the whole, we may conclude that macadam and macadam concrete roadways, although they may answer well in secondary streets, should not be laid in main thoroughfares. We may also conclude that neither this system of road-making, nor any development of it, is likely to produce the street of the future.

Wood and asphalt pavements are in several respects superior to granite. Much less mud and dust is formed on them, and they are comparatively free from noise. They are also safer, except when thoroughly wet. I am not aware that granite is in any respect superior to either of them. Even if they should turn out to be more costly, owing to their requiring repair more frequently and having to be renewed sooner, I think the advantages already mentioned will more than compensate for the extra price. Only long and extensive experience can settle this point satisfactorily, because many indirect benefits are secured by their use, which it is not easy to estimate in money; and there are many expenses connected with all pavements which are not usually included under the head of maintenance. On the whole, it seems probable that either wood or asphalt is destined gradually to supersede granite as a paving material, at least in large and wealthy towns

It therefore only remains for us to find out which of them makes the best, or, to quote the *Pall Mall Gazette*, the "least objectionable" road surface. Mr. Haywood has fully reported to the Commissioners of Sewers of the city of London as to the relative advantages, together with the probable expense and durability of these pavements. In 1873 he made a very extensive series of observations, in order to ascertain their relative safety. Allowing for all modifying influences, he found that wood is safer than asphalt, as not only fewer accidents occur on it, but those which do happen are of the kind least injurious to horses and obstructive to traffic.

Further, Mr. Haywood considers that wood is the most quiet, but also the dearest; that they both can be kept equally clean, and will probably be found equally durable. That they can be laid and repaired with about equal facility, but that the best repairs can be made in asphalt.

The general impression left in reading the report is that, except as regards safety, there is not much difference between them. Wood is, however, about twice as safe as asphalt.

Let us see which of these two pavements is likely to endure best, judging from theoretical considerations alone. Wood pavement is constructed according to Macadam's principles, asphalt according to Telford's. Wood is laid on a comparatively soft foundation, and the whole roadway forms a kind of elastic arch, which partly resists vertical pressure, by distributing the thrust horizontally through its entire substance. In asphalt roadways, on the other hand, the concrete foundation may be considered the real road, the asphalt being merely a sort of protection, which gives a smooth surface, and can be easily renewed as it is worn away. But this combination, I fear, devoid of elasticity.

Elasticity is without doubt essential to the permanence of a roadway. This quality certainly appears to be secured in improved wood pavements, though not in asphalt. But it may be contended that the asphalt covering has in itself sufficient elasticity, and that it acts like a sheet of vulcanized india rubber. Possibly a concrete bed covered with a sheet of vulcanized india rubber might form a good road. I think a less yielding surface is desirable, and that elasticity of form is likely to give better results than mere elasticity of volume. For these reasons I venture to think that improved wood pavement will ultimately be found superior to Val de Travers asphalt, and that the introduction of the former has been a decided step in the right direction. I also think that we may look for further improvements in modifications of this system, and that a roadway having the requisite surface qualities, combined with elasticity of form, will always be

superior to one whose chief recommendation is mere solidity.

The first cost of the improved wood pavement and the asphalt pavement in London is the same, namely, \$4 to \$4.50 per square yard. Cost of repairs per annum also about the same, namely, 50 cents per square yard.

A PRIZE PLAN FOR A FIREPROOF HOUSE.

On page 280 of our volume XXXI., we announced the offer, by the Merchants', Farmers', and Mechanics' Savings Bank, of Chicago, Ill., of a premium of \$1,000 for the best set of plans and specifications for a fireproof dwelling house, of not less than five rooms, and a total capacity of at least 5,500 feet. Up to the end of last year, thirty applicants for the prize had put in an appearance, and a committee have since been occupied in investigating the merits of the designs. They recently awarded the prize to Mr. A. J. Smith, of Clark street, Chicago, whose plans were for a one story house, 20x43; a two story house, 18x26½; and a two story store and dwelling, 22x57. The cost of these buildings, respectively, is to be \$1,200, \$1,700, and \$3,600.

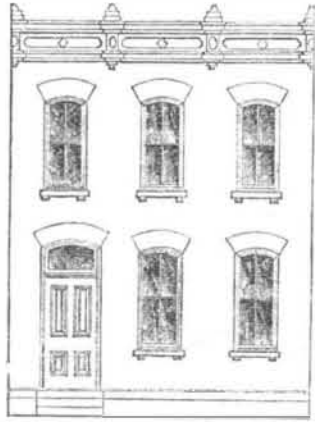


Fig. 1.—FRONT ELEVATION.

The one story dwelling house is a building 43x20, of five rooms, consisting of parlor 13x10½, and two bed rooms 10x8½ each. The height of each room will be 10 feet in the clear between floor and ceiling. An important feature in this plan is that, should a fire occur in the front part of the building, the rear portion may be preserved intact, and vice versa. The outside walls are hollow from foundation to roof. The floor, beams, and rafters are wood, protected from fire by concrete, one and one half inches thick on the ceilings and underneath the floors; and the roof is covered with tin on the

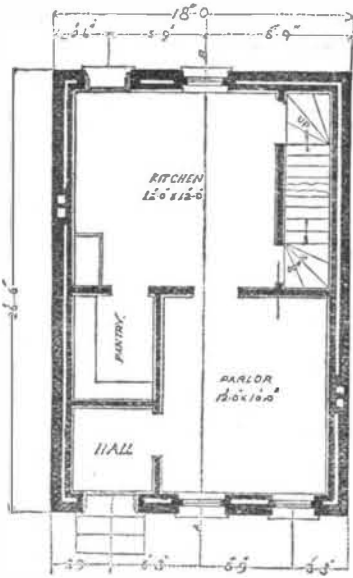


Fig. 2.—PRINCIPAL STORY.

top of the concrete. Thorough ventilation is provided by flues adjoining the fire flues, and topped out in the chimney. There is a ventilated air space underneath the ground floor, preventing dampness from arising; and there is also a ventilated air space between the ceilings and roof, to prevent the

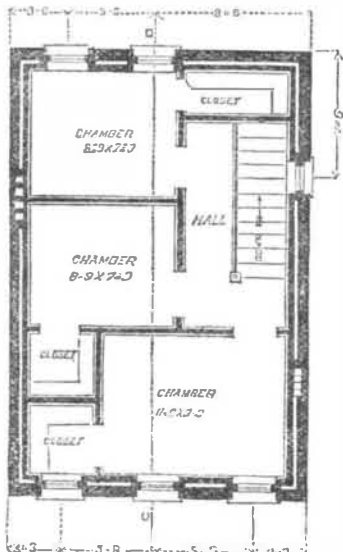


Fig. 3.—SECOND STORY.

heat of summer from affecting the rooms. The fire flues will be lined with flue pipes eight inches square. There will be a drain pipe, connected with sinks and closets and with main sewer, to carry off all surface water, slops, etc.

The two story dwelling, of which we present a front elevation, Fig. 1, and the ground plans, Figs. 2 and 3, is a building 26½x18, with five rooms, two on the ground or principal floor, and three on the upper floor, the sizes of which are: Parlor 12x10, and kitchen 12x12. The three upper rooms are for bed rooms, the sizes of which are, respectively, 11x9,

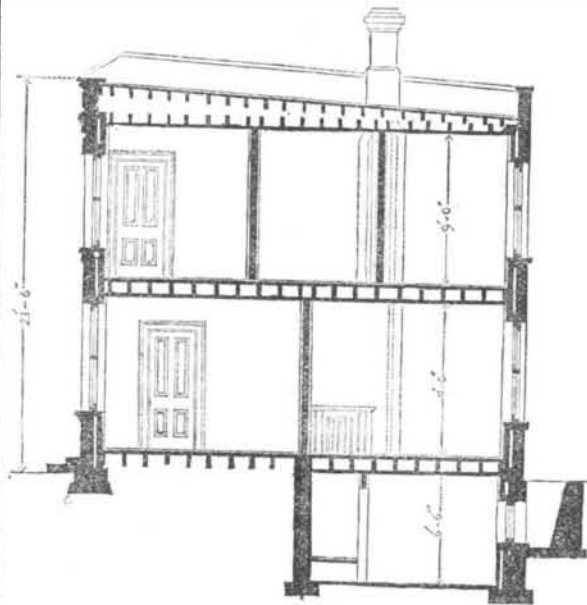


Fig. 4.—SECTION AT A, B, C, D.

8½x7½, and 8½x7½. This building has a cellar for coal and wood, fitted up with water closet. The size of cellar, within walls, will be 12x20. The upper story and the principal story will be each 9 feet in height, and the cellar 6 feet 6 inches.

The building with store and dwelling combined is 22x57. The entire principal story is occupied with store room. The upper story is divided into seven rooms, consisting of two parlors, 11x12 each, bed room 11x11½, bed room 13x9½, bed room 10½x9½, kitchen 13x11, dining room 13x11.

The three buildings are similar in construction. The cheapness of the structures is unquestionable, and we trust it will be long ere their fire-resisting qualities are put to the test.

A Water Rat taking an Artificial Fly.

A correspondent writes to *Land and Water* as follows: "In Mr. Buckland's chapter on 'The Rat,' he mentions the catching of a rat by one of the flies of a friend while fishing, hooked by chance; but I remember fishing with my father for trout in the May fly season, in one of the Derbyshire streams, when a water rat dashed out from his hole in the bank and took the fly in his mouth (the fly was the natural drake or May fly). After playing with him some time, he swam to the side, became entangled in some dead branches, and, breaking the hook away, escaped. Although I have been an ardent fisherman, this is the only instance I have known of the rat actually seizing the fly."

A SHAFT has been sunk at Lawton, England, for the purpose of pumping up brine, to be conveyed by pipes to the coke ovens in connection with a colliery, a distance of two or three miles, there to be converted into salt by means of the waste heat from the ovens. The cost of the undertaking will, it is said, exceed \$200,000.

DECISIONS OF THE COURTS.

United States Circuit Court.—Southern District of Ohio.

PATENT LUBRICATOR.—WILLIAM W. PELTON AND HIRAM TAYLOR vs. GARDNER WATERS, JOSEPH J. STARR, AND CHARLES D. JOHNSON. [In equity.—Before EMMONS and SWING, JJ.—December, 1874.] STATEMENT OF FACTS.

Gardner Waters filed an application for letters patent for an "Improvement in Lubricators," March 31, 1868. On the 21st of April, 1868, Hiram Taylor made an application for a patent for substantially the same improvement. Both applications were rejected by the examiner. Waters narrowed his claim, and thereupon received a patent of limited scope; but Taylor persisted in his claim, and upon appeal secured his patent, which was issued to him June 29, 1868.

When Waters learned that a patent had been issued to Taylor with a "broad claim," he filed a second application, asserting therein a claim for the invention substantially as covered by the Taylor patent, and demanded an interference. This was granted him; and upon the final appeal to one of the judges of the Supreme Court of the District of Columbia, he was adjudged the prior inventor; and accordingly letters patent were issued to him June 29, 1869.

The present suit under the Taylor patent had been begun in November, 1863, complainant's testimony being duly taken after the issue was joined.

In December, 1869, defendants filed an amended and supplemental answer, claiming that Waters was the first inventor, and setting up the interference decided upon the answer, and testimony for defendants, and rebutting proofs for complainants, taken and filed in 1870.

This hearing was had at the October term of 1874. At the hearing the defendants objected to a certified copy of an application for a patent made by the complainant Taylor in September, 1867, which, it was claimed, described the device in controversy, on the ground that the copy of the application referred to drawings as being a part of the original application, no drawings, however, being attached to the copy. The objection was sustained by the court.

EMMONS, Circuit Judge, delivered the opinion of the court. The patent of the complainant, Taylor, antedates that of the defendant, Waters, and he is entitled to the presumption that his invention is novel. This presumption is of importance only where the testimony is conflicting, and any considerable doubt is involved as to who is the first inventor. It is of but little consequence in this case. It has, however, been much argued.

The defendant insists that his application was made earlier than that of the complainant, and therefore his patent is to have relation to the date of its filing. As a general rule, this is undoubtedly true.

We do not intend to question, or even qualify, any of the cases on the subject, which we recently considered and applied in the case of the Dental Vulcanite Company vs. Willis. These judgments assert several exceptions to the application of the rule.

If, intermediate the first and second application, the patentee manifests an actual intention to abandon the first, his patent will have relation to the last one only. His actual intention severs the proceeding. The law deems the application terminated and as bearing no relation to the patent, which rests solely on the last one.

A withdrawal of a first application, and the reception of the fee paid back from the department, under the statute, is also a severance of the proceedings. The application so withdrawn is not deemed part of any proceeding, under a subsequent proceeding for a patent.

These are but illustrations of exceptions to the general principle, which deems the first in a series of applications for a patent as that upon which a patent depends.

We think the case before us comes within the reason of these exceptions. Under the first application of the defendant he actually received a patent, after having amended his specifications so as to exclude the present device. We think the act wholly terminated the first proceeding. It was ended in the accomplishment of its object. The decision of the department was acquiesced in, and its final judgment obtained.

The subsequent application in such circumstances must be deemed the commencement of a new proceeding, and as that alone upon which the patent is granted in pursuance of it depends.

This last application was subsequent to that of complainant's patent; and, as they are both for precisely the same device, the presumption is in favor of priority of invention on the part of complainant.

The complainant swears that in the fall of 1866 he cast an impervious joint upon the neck of a bottle. He proves his statement by a blacksmith, who came to present an account, and saw such a bottle in his shop; and the complainant's brother testifies that he also saw it at subsequent period.

If his rights depended upon our adopting the theory that he completed his invention at that time, by such means, we should dismiss the bill. Positive as the testimony is, the fact of success at a period so early is too inconsistent with his subsequent conduct, manifestly evincing an entire ignorance of the thing we think he subsequently invented. Such singular stories are incident in nearly all these controversies in reference to priority of invention.

Parties frequently prove the making of some fixture which is destroyed; of some model which is lost; and some conversation which has never been acted upon sufficiently early to antedate his opponent. We could give many reasons why we fear the history of this castor bottle finds its origin in the fact that the defendant in his testimony places his discovery about a year earlier than we think it was invented by any one.

Far more satisfactory and convincing is the proof that the complainant, in the latter part of 1867 and subsequently, was making and vending, in large quantities, the patented device. The defendant's agent, Pelton, who was selling at that time a different article for the defendant, in the fore part of 1868, bought of the complainant a number of lubricators of the kind in question, to supply the place of an inferior article, manufactured by the defendant, which he had sold for him, and which, on account of their leaking, had to be supplied by a better.

It is needless to recapitulate the proofs; they are abundant and uncontradicted, to show that, from the latter part of 1867 forward, the complainant was in the full manufacture and sale of the patented device. There is no satisfactory evidence of its invention before that date. It is with this concession that we grant him a decree.

To overcome this case and prove the defendant to be a prior inventor, he himself swears that, in the latter part of 1866, he too made an impervious joint upon the neck of a glass globe, tested it with steam, and placed it upon the crosshead of an engine, where it worked successfully, as he proves by Henderson, the colored engineer, for three successive years. The witnesses, Reynolds and Phillips, with more or less confirmation, sustain Henderson.

We are absolved from the duty of contrasting this proof with other unquestioned facts in the case, for the purpose of ascertaining whether it was not 1867 instead of 1866 that this successful lubricator was made, because the defendant's own statement as a witness renders it wholly unnecessary. He says most explicitly, that though he did succeed accidentally in making one close joint upon the neck of that single globe, he tried in vain, for five months thereafter, to make another. He says he broke many bottles in the attempt; that he did not even partially succeed but in a single instance during the five months; and that one leaked so badly it was unfit for use. It was not until 1868 that he learned how to produce a close joint, and a fine considerably after complainant was publicly manufacturing them. The accidental making of this one joint without any knowledge on the part of the producer of how to accomplish it, with utter inability on his part to produce another like it, is not invention. His ignorance was so complete concerning the mode of its production that he himself swears he not only did not attempt their manufacture, but laid aside a large stock of material during the period for the making of a wholly different article. These he did manufacture, and put upon the market through Starr & Pelton, his agents. He not only had not invented a close joint, but he had so little hope of success that he prepared extensively for the making of a different and inferior lubricator. In these circumstances a single fortuitous success is by no means invention, within the protection of the patent law. He not only did not attempt to produce a close joint, but he did not possess it himself. It might as well be claimed that he, that should be carrying three bottles in a basket, which being accidentally broken, their contents mixing in unknown quantities upon the earth makes some useful compound, and enters upon a series of experiments for the purpose of ascertaining, if possible, its relative proportions, but who does not succeed in doing so until after another has successfully completed the discovery, can antedate him by proof of the causality by which he saw the same thing produced. When the defendant saw the first bottle on the crosshead of the engine, without any knowledge of the mode by which he could make another, he stood in no other relation to it, as far as the patent law is concerned, than if it had been placed there by somebody else.

It is not necessary to consider the many other facts in the case which tend to show that the defendant in fact obtained his knowledge of the device from the complainant. We refer to a few of them only, as illustrating the rightfulness of the principle we apply to the defendant's testimony. When Pelton, his agent for the sale of a different manufacture, as late as 1868, presented the defendant with one of the complainant's lubricators, he pronounced it impracticable. He said they could not be profitably made, and that Pelton did not know how many bottles must necessarily be broken by the complainant in making his lubricator.

Other analogous proofs exist. We refer to these single instances only to show the inconsistency of treating that man as an inventor who is so discouraged by his own failures, and the repeated breaking of his bottles, that he pronounces the attempt impracticable, and is himself at that time manufacturing a different and poorer article for sale. He is at that time and the mysterious production of the one joint which the court is asked to believe was placed upon the crossheads in 1866.

We think the presumption of the law arising from the anterior patent of the complainant is consonant with the inference of the fact to be drawn from the testimony.

The complainant was the first inventor of the lubricator described in his patent. The accidental making of one in 1866 by the defendant, if everything occurred precisely as he swears it did, is not invention in any sense. There can hardly be said to be a conflict of testimony in reference to the fact that the complainant, for many months before the defendant did so, manufactured and put these articles on the market.

There may be a decree for the complainant in the usual form.

[Reuben Syler, for complainants.
E. W. Kirtledge, for defendants.]

NEW BOOKS AND PUBLICATIONS.

TRANSITS OF VENUS, a Popular Account of the Past and Coming Transits, from the First, observed by Horrocks in A. D. 1639, and the Transit of A. D. 2012. By Richard Proctor, B.A., Author of "Other Worlds than Ours," etc. With Twenty Plates and Thirty-Seven Woodcuts. Price \$3. New York city: R. Worthington & Co., 750 Broadway.

The subject of this volume and the renown of its author combine to render it most acceptable at the present time. The signal success of the recent observations has given a universal impetus to the public interest in the question, and there is no doubt that the transit of 1882, which will be visible in all parts of New England and the Middle and Southern States, will be watched by millions of our people, anxious to behold the strange spectacle on which the solution of so many mighty problems depends. Mr. Proctor's work is complete as a history of the phenomenon, and as a lucid and authoritative explanation of its phases, and its great import to scientific investigation; and the maps and illustrations, executed in a beautiful and very accurate manner, give additional value to a book which we unhesitatingly pronounce to be the best treatise which has yet appeared on the subject.

THE ORBITAL SYSTEM OF THE UNIVERSE. By Antony Welsch, Clinton, Iowa. Clinton: Allen & Bowers.

We have been led, by a brief perusal of this volume, to wonder upon the facility with which books get into print. Here is a work full of chaotic ideas, written in gross violation of the English language, on a subject of which the author gives us no reason to believe that he has the slightest comprehension himself, and on which he does not begin to attempt to enlighten his readers; yet 160 pages of it are printed in good style and well bound, and some hundreds of dollars must have been disbursed, which the author or his publisher will never see again, unless there comes a cataclysm of the intelligence of the human race.

THE INEXPEDIENCY OF AN IRREDEEMABLE PAPER CURRENCY. By John Stuart Mill. New York city: Henry L. Hinton, 744 Broadway.

A timely reprint of a convincing argument against unlimited and perpetual indebtedness.

OUR CURRENCY, WHAT IT IS, AND WHAT IT SHOULD BE. By John G. Drew. New York city: Henry L. Hinton, 744 Broadway.

A REVIEW OF SENATOR JONES' SPEECH ON THE BANKING AND CURRENCY BILL. By Henry S. Fitch. San Francisco, Cal.: Bosqui & Co., Clay and Leidesdorff streets.

These two pamphlets are earnest protests in favor of the policy of paying an old debt with a new one, and are not above the average of their class of literature.

TRANSACTIONS OF THE AMERICAN INSTITUTE OF MINING ENGINEERS. Volume II. Easton, Pa.: Published by the Institute, T. M. Drown, Secretary, Lafayette College.

The American Institution of Mining Engineers has a high reputation among our scientific bodies, and certainly none is doing or can do more valuable work. The future prosperity of this country depends in chief on the development of her enormous and varied mineral wealth; and the profession which is to pioneer this progressive movement fortunately contains many of our most illustrious scientists. We commend this volume to the perusal of all who are interested in the present industries and the future possibilities of the United States.

ON THE ALLEN GOVERNOR AND THROTTLE VALVE, a Paper read before the Institution of Mechanical Engineers, London, by F. W. Kitson, of Leeds, England.