

A COMBINATION WARDROBE.

In chambers and in houses where the bedroom accommodation is limited, which very frequently is the case, combination furniture (such as the wardrobe here illustrated) is exceedingly convenient as well as useful. The *multum in parvo* piece of furniture is, however, by no means always deserving of the taking title thus applied to it, and instead of serving all the purposes aimed at fairly well, results in failure all round. Experience of this kind has led many to avoid so-called "combination furniture" as a delusion and a snare; but conclusions like this, says the *Building News*, are not to be universally depended upon, and the wardrobe here illustrated by Messrs. W. A. and S. Smee goes far to show how much really useful space can be got out of one comparatively small and compact piece of furniture when thought and ingenuity are brought to bear upon it.

A wash-hand stand occupies the right hand corner with useful drawer under, the marble top, a chamber cupboard, and a curtained recess below. Three shelves are arranged over the table top, and the lower one in the angle is intended for the sponge. The central space is utilized as a hanging cupboard, with a large silvered glass mirror in the panel of the door. To the left a clothes press extends the rest of the width, over a useful recess for books and bottles. Then comes a table top, with three drawers below, and under these is another cupboard for hats, bonnets, boots, or slippers. The whole stands on a heavy plinth.

THE BOAT BILL HERON.

This remarkable bird (*Canceroma cochleareae*) is a native of South America. It has a singular shapeless flat bill, bent like a hook at the end.

Both mandibles are shortened and hollowed so as to resemble a pair of boats placed upon each other—from this it derives its name. Its legs are nearly covered with feathers; the wings are strong and moderately long. The feathers upon the back of the head and neck are elongated, forming a plume which hangs down over the back and shoulders. The feathers on the throat, back, and side of the neck are white. The plumage of the back is bright gray, with occasionally a touch of rusty red. The wing and tail feathers are grayish white; the sides black.

The eye is brown, the bill brown, and the foot yellowish. The length of the bird is about fifty-eight centimeters. The female is somewhat smaller; the young bird is reddish brown—darker upon the back—and paler on the breast.

The boat bill heron lives in the thickets and marshes on the shores of the forest streams of Brazil. It may often be seen sitting on the branches overhanging the water. It is more abundant in the inland forests than near the sea. On the approach of a boat it hops from branch to branch, and quickly hides itself.

Its food consists of various crustacea found at low water, but not of fish.

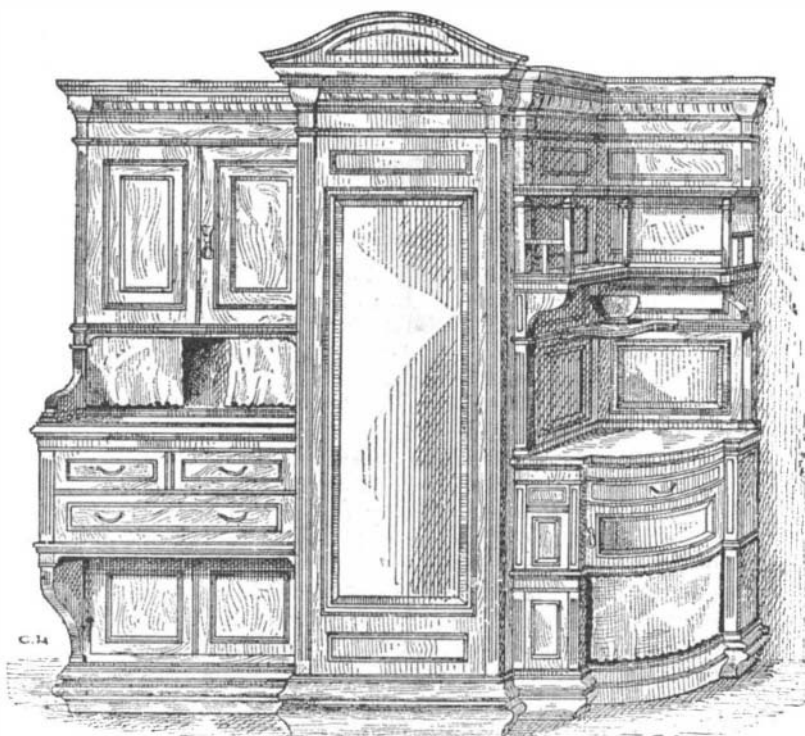
The Prince of Wied found only worms in the craw of one of these birds which he killed, and thinks that the bird with its broad, boat-shaped bill cannot catch fish.

Schomburgk says that they make a clatter with their bill, like a stork, or they do this at least when they are captured. Little is known of their brooding. The egg is oval, white, destitute of luster, and without spots.—*From Brehm's Animal Life.*

Making Sure Fits.

A subscriber to the *London Boot and Shoe Trades' Journal* gives the following description of a plan he adopts for making "sure fits," and thereby avoiding the annoyance of having goods left on his hands by customers: "I make it an invariable rule to measure customers myself. Having drawn the outline of a foot on a sheet of paper, and taken the girth measurements carefully, I fit up a pair of lasts to correspond with the measure. I always keep by me a few pairs of uppers—stale or damaged goods—and I last a pair of these on the lasts so fitted, using a stout pair of insoles. A pair of soles cut out of lifting, and which see service times over, are then put on and attached by a few pegs. The lasts are then drawn, the pegs cut out, and the "dummy" boots are sent to the customer with the request that he will wear them for an hour or two indoors, and a note is made of any suggestions he may offer as to additional ease being required in any part. Alterations, if required, are

then made in the fittings on the lasts, before the customer's order is made up. Since I adopted this plan I have never had a customer's order returned for misfitting. I estimate the cost of making up the "dummy" boots at a shilling, and this, of course, I add to the price of the goods. A neighbor, a tailor, tries on his coats and insures himself against loss. It was from his practice," adds the writer, and it seems to us a practical idea, which if adopted by our boot-makers would likely enhance the comfort of many of

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their customers, as well as save the maker much annoyance and cost for misfits, "that I took the idea."

A Horizontal Well.

In "Kidder's History of New Ipswich, N. H.," published in 1852, the following is related about David Hills, who became a resident of that town in 1772:

"In supplying himself with water he resorted to a most successful expedient. He reasoned thus: 'If my neighbor at the top of the hill obtains water by digging sixty feet,

Loosen the rod, however, as soon as it will not injure.

I would advise those making such a pipe, if they have had no experience in using cement, to employ a person who has. Much material and time may thus be saved without experimenting to get it right. The work must be done in dry or fair weather. Use the best materials; the fresher the cement the better. Old cement should not be tried. The sand must be perfectly clean. A pipe can thus be made which if laid below the frost will last as long as a stone.

I know of one such pipe which has been in use forty-five years, and is as good to-day as when first made.

The Zodiacal Light.

The cause of the luminous phenomenon known as the zodiacal light has long been the subject of speculation, and numerous hypotheses have been suggested to account for it. A correspondent of *Cosmos les Mondes* regards the entire phenomenon as one of the reflection of light. What we observe is nothing but the reflection of that part of the earth which is illuminated shortly before the sun rises and after it sets. In order to understand this we must assume that the earth is surrounded for a certain distance by a comparatively dense envelope of gas, beyond which the latter exists in a state of great attenuation. We therefore have two media of different density which influence the rays of light in the well known way, refracting them up to a certain limiting angle of incidence, beyond which total reflection takes place.

If we imagine the sun a little below the horizon, a part of the earth directly in front of us will reflect the rays of the sun at a very obtuse angle; these rays, meeting the boundary of the media at a very obtuse angle, will be totally reflected, and it is these totally reflected rays which we see.

This explains the appearance of the light in the shape of a cone whose line is always inclined in the direction of the ecliptic, and whose base is toward the sun; it also accounts for the fact that the changes observed in its appearance follow a reverse order in

the evening from that in the morning. The reason why the cone is longer in the evening than in the morning is that the layer of dense atmosphere is expanded by reason of its exposure to the sun's radiation through the entire day, whereas in the morning the reverse is the case.

BLINDNESS has steadily decreased in England for the last thirty years, owing, it is thought, to the improvement of the opticians and the almost complete extinction of the smallpox among children.

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why may not I obtain the same by running a shaft into the side till I reach the same point?' He acted upon the obvious conclusion, and made a horizontal well, which not only supplied a perpetual stream to his house without the trouble of drawing, but afforded a most ample and capital cellar for the storage of butter, cheese, and other articles from both heat and cold."

KEROSENE oil will soften boots and shoes that have been hardened by water, and will render them pliable and new.

Destructive Legislation.

The destructive tendency of much of the legislation of this country is forcibly illustrated by a recent bill which has been introduced into the House of Representatives, to reduce the lifetime of patents from seventeen years to five years. This bill strikes a blow at the very life of our civilization. Americans have signalized themselves in the world of thought in many ways, but in nothing, perhaps, more than in invention. So much encouragement has been given to inventors, by allowing them to reap, to a certain extent, the fruits of their labors, that the inventive powers of men have never before been so active or productive in the history of the world. Inventors made the very discovery of this continent possible; enabled men to subdue and settle it rapidly in its remotest parts; advanced our modern civilization to a degree of perfection never before attained; increased the powers of men and multiplied the application of skilled labor in every department of industry, and made every man in this country richer and wiser, more comfortable and happy. It is not possible for a man to live in this country without enjoying in multiplied forms the benefits conferred upon him by inventors. The benefits of invention are as diffusive as the sunlight, as free as the air we breathe, and as pervasive as the heat that steals into our homes and makes them comfortable. Invention has improved our houses, our clothing, our furniture, our vehicles, our machines, our tools, our instruments, our implements, our apparatus, in fact, everything we possess.

No man can sit, or walk, or ride, or eat, or drink, or sleep, or work, or write, or fish, or hunt, or fight, or legislate without doing it at an immeasurable advantage, compared to one doing the same thing fifty years ago. Aside from Christianity itself, nothing has done so much for this country in all its highest and best interests as invention. To strike down invention is to suspend progress in American science and arts, to arrest advancement in our manufacturing interests, to deal a death-blow to the development of the mechanical powers, and to prevent any further improvement in agriculture. Invention has taken the drudgery out of farming, and made it a pleasant employment. Invention tends powerfully to make every farmer in the West independent, comfortable, and happy. Invention brings to the most distant farmer, on our otherwise lonely and almost uninhabitable prairies, the rich blessings of our modern civilization. The most distant farmer is put within easy reach of centers of population, reads his morning paper, struck off by modern presses, hears the most important news flashed from all parts of the world, and enjoys life almost as well as if he lived in the very suburbs of some metropolis.

The mechanic finds every tool and machine which he uses improved by inventors, which saves him an immense outlay of muscle. The very capitol building, in which Congressmen sit and strike down invention, is indebted to inventors in multiplied ways for its comfort and elegance. The pens, paper, ink, inkstands, paper folders, stamps, desks, chairs, books, the maps and charts, everything, in fact, which Congressmen use, has been invented or improved by inventors. Invention saves them long and toilsome journeys across the country on foot or on horseback, to and from their homes, during which they would surely earn their mileage.

Seventeen years without renewal for the life of a patent is not a moment too long. The best thoughts of a lifetime are often given to an invention, and a fortune put into it. The invention is studied on all sides, special courses of study bearing on it are sometimes pursued, long and costly experiments made, the inventive moods are carefully watched, until at some rare and happy moment the inventive thought flashes like a ray of light across the mind. Nothing is more divine in this world, or more precious to mankind in all that makes life desirable, than the rare flashes of thought of inventive genius.

Then, when the invention is once made, it has to run the gauntlet of the Patent Office, where it has often been anticipated by some other invention, or for some other cause fails. When the patent is issued, the work is only half done. Inventors often involve their whole means in manufacturing and putting their inventions on the market. And some of the very best inventions, like the first anthracite coal carried to Philadelphia, which no one would buy, take some years before they begin to sell to any extent.

The great majority of the quarter of a million of patents taken out in this country have never produced anything for inventors, but have only been a source of loss of time, effort, and money. Some patents have become lucrative, and rarely an inventor, or more probably a purchaser, has made a notable fortune. But every invention which has enriched an inventor has made the world a thousand times richer, more comfortable, and happy. To cut down the life of a patent to five years would be to invention like trying to make a horse plow with his backbone taken out. And yet inventors cannot expect much encouragement from any legislators who never invent anything, unless it is mischief.

But this world cannot do too much for a man who, by his inventive genius, enables it to flash thought around the earth, or drive steam carriages across the continent, or make a ship walk the water "like a thing of life," or to render the most excruciating surgical operations painless.

Our world, in a word, is indebted to invention for almost all its comforts and luxuries. The air is clearer, the water purer, the soil more fertile, the cattle fatter, the horses stronger, the sheep and goats have finer fleeces, the grains are more productive, the fruits better, our homes more com-

fortable and cheery, our clothing warmer, our vehicles safer, our books and papers more numerous and valuable, and our wives and children are more healthy and happy on account of the inventive faculty of men.

Under the light of Christianity, invention has furnished us the very means of translating, publishing, and circulating the Bible over the globe. Everything is brighter and better and wiser in the whole world on account of invention, except our legislators, who seem to have lost their wits. If they do not stop trying to quench the lights of the age, and voting us back toward the dark ages, we fear it will not be long before we all, like our grandfathers, will go to mill on horseback, with the wheat in one end of the sack and a stone in the other. We would advise every legislator who votes for this bill to put on a fool's cap, and wear sackcloth and ashes for thirty days, and then try to keep step in the march of our modern civilization.—*Kansas City Centropolis.*

Artillery and Armor Plates.

At the Royal United Service Institution recently a paper was read "On the Present Position of the Armor Question, with a Summary of the Principal Recent Plate Experiments." The lecturer was Captain C. Orde Browne, late of the Royal Artillery, and at present lecturer at Woolwich in the Department of Artillery Studies on the subject of Armor Plates. The paper was illustrated by diagrams, and the object of it was stated to be the presentation of such features of the armor question as appeared to be peculiar and of great importance. Captain Browne began by explaining that "soft armor" applied to plates which yielded to perforation, and "hard armor" meant that which would not so yield, and was destroyed by breaking up. The first experiments noticed were the Krupp Meppem plates trials in 1883. The trials were against soft armor, either directly or obliquely, and he showed, in respect to the direct firing, that a projectile with a striking energy of 2,328 foot tons, for which it would have been sufficient work to have penetrated 12 inches of iron in two thicknesses, went through two 7 inch plates, and passed 328 yards up the range uninjured. He thought this was to be accounted for by the fact that 10 inches of wood between the plates was sufficiently thick to allow the point of the projectile to get clear of the bent and broken edges of the front plate before meeting the second, and thus the *maximum* resistance was not got out of the plates. The best thickness of wood was about five inches, and with this, while the plates were prevented from jarring one upon the other, the projectile could not get clear of one plate before it was resisted by the second. In the second experiment, that of the oblique fire, the projectile, with a striking velocity of 1,750 ft., was more than a match for the plate, 7.9 in. with a backing of 9.84 of wood and 0.98 of skin. The Spezia trials of November, 1882, were afterward examined by the lecturer, who described the hard armor plates made by Cammell, by Sir John Brown and Company, and by M. Schneider, and the damage which was done to them by the guns, the results being shown in diagrams, and dealt with in exhaustive figures. Captain Browne urged the need of a better system of estimating the effects of artillery on hard armor than was now possessed, the need for developing the manufacture of steel projectiles for artillery, and the necessity for making experiments in this country on very hard armor. He said that our steel faced armor was unrivaled, and in all the most important experiments abroad the English *material* took a prominent place; but nevertheless, we could by no means afford to shut our eyes to the elements in which we might be weak, and in which foreign powers might be gaining an advantage over us.

Pine Extract for Bathing.

It has long been recognized that the atmosphere of pine forests has an invigorating and beneficial effect upon people with weak constitutions and suffering from pulmonary disorders. At some of the watering places of Germany the very simple prescription of the physician is that the patient should spend several hours a day walking or riding through the pine wood. This simple treatment is sometimes supplemented by the taking of pine baths, and in the case of kidney diseases and for delicate children this is claimed to be highly beneficial. The bath is prepared by simply pouring into the water about half a tumblerful of an extract made from the fresh needles of the pine. This extract is dark in color and closely resembles molasses in consistency, and when poured into the bath gives the water a muddy appearance with a slight foam on the surface. The repugnance one feels to enter into such a muddy looking fluid is dispelled as soon as the delightful aroma which arises from the bath is inhaled. Although there may be some doubt whether pine baths act upon the system in any other wise than as a tonic, still as an adjunct to the daily bath, infusion of the pine extract induces a most agreeable sensation. It gives the skin a deliciously soft and silky feeling, and the effect upon the nerves is quieting. It is a matter of some surprise to us that the business of manufacturing and bottling the extract for private use and public bathing establishments has not been tried in this country, where pine forests abound so extensively. The extract when properly bottled and securely corked will not deteriorate for a long time, and the cost for gathering the pine needles and extracting their tarry substance would not be very great, while the demand for it would likely increase to large proportions when the public became accustomed to its use.

Progress on the Panama Canal.

There are many who yet doubt whether De Lesseps and his associates will eventually succeed in piercing the Isthmus of Panama with a practical canal. The work has now been fairly commenced, and some \$40,000,000 has thus far been expended, not including the money paid for the Panama Railroad, but it is plainly apparent that the magnitude of the undertaking has been greatly underestimated, as it is also that the canal cannot be completed by the year 1888, the time announced by M. de Lesseps for its opening.

Lieut. Raymond P. Rogers, of the U. S. Navy, has lately passed over the line of the canal, where every facility was afforded him of making a thorough inspection, and his report brings our information concerning the work up to date. The number of men now employed in all sections is probably at least 15,000, brought chiefly from Jamaica and Cartagena, and the amount of excavation has gradually increased until 700,000 cubic meters per month have been reached. It was hoped that the month of February would produce 1,000,000 cubic meters, and that later the amount of 2,500,000 meters would be removed each month. The rainy season begins in May and continues till December, and it is estimated that the rains will reduce the excavation of the dry season by about one-fifth, so that it is not unlikely that from the 1st of May next an annual excavation of 25,000,000 cubic meters may be counted upon.

It is not impossible, with the requisite money, that the sections of the canal, exclusive of those of Obispo, Empire, Culebra, and Paraise, may be ready for service by the year 1888, but it does not seem possible that these most formidable sections, with their cuts of great depth and width, can be made ready, nor that the ports at the extremities can be completed for some years later. Consider the section of Culebra, with its great excavation of more than 25,000,000 of cubic meters, and suppose that the large amount of 300,000 cubic meters be removed each month from it; at this rate it would take seven years to complete this section.

There is an immense amount of machinery and material now on hand or contracted for, and it is probable that there remains sufficient funds from the amount already subscribed to meet promptly the current expenses for two years to come. After that, with the enterprise well begun and with a fair proportion of the whole excavation already removed, it would seem plausible that the prestige of M. de Lesseps' name, and the confidence which the investors of France have in his ability to carry through successfully this great work, would procure the further necessary subscriptions. Whether the estimated sum—600,000,000f.—will prove sufficient time alone can decide; but as one-third of this amount has already been expended, it would seem insufficient to complete this most formidable undertaking.

The climate has thus far not proved so fatal in most of the sections as might have been anticipated. Of course, exposure to the sun, heat, and fatigue have produced fevers and have occasioned mortality; but, as a rule, the employees of the company seem in fair health, and the Europeans have suffered more than the laborers, natives of the tropics. But, while most of the sections have not been very sickly, the neighborhood of Panama has proved an exception to the general rule. Here, during the past six months have appeared, in larger numbers than usual, pernicious fevers, and there have been several cases of yellow fever which have proved fatal.

How to Use Arsenic.

I am frequently asked if I am ever troubled with insects in my natural history specimens, and I only have one answer—never; and if my directions are followed, no one ever need be. After skinning, immediately cover the moist skin with pure arsenic—be particular to cover every part. I keep my arsenic in a large box and put my skins right into the arsenic; pull out the leg and wing bones as far as possible so as to introduce the arsenic to the extreme parts; the eye sockets, skull, and mouth should be well covered with the preservative. I usually, before mounting, place the specimen in my office cellar, and let it remain twenty-four or more hours, so as to get well impregnated with arsenic.

After mounting, brush the bill, legs below the feathers, feet, and ends of the wings that cannot be skinned, with a solution of corrosive sublimate in alcohol—about a teaspoonful of the former to one-half pint of the latter. I have bird skins that I have designedly left exposed to insects for thirty-five years which to-day are uninjured and will remain so forever—that is a good long time, I know, but they are good for it. I know of several collectors who have laughed at my "useless waste of arsenic," thinking a little just as good, or who prefer arsenical soap, or some other preservatives, whose collections are entirely ruined.

I have been in the habit of using from fifteen to thirty-five pounds a year for thirty-seven years in my private collection. It created some merriment in court, where I was summoned as a witness in a case of arsenical poisoning, when asked if I was familiar with arsenic, and I replied that I had probably used one-half ton of it. "What!" said the counsel, "given one-half ton to your patients!" When I receive dry skins, I pack them very loosely in a tight large box, leaving space for an iron kettle, in which are placed live coals. On these pour sulphur and close the box tight, leaving it for twenty-four hours or so; and if there are insects in the skins you will find them dead. Then subject the skin to the same arsenical treatment as a fresh skin.—*Wm. Wood, Ornithologist.*