CURIOUS PLANTS.

There is little to our minds interesting in a garden filled with roses, lilies, fuchsias, heliotropes, and pansies, or any other simple selection of the flowers that every one knows. True, their fragrance is always delicious, and their beautiful colors never pall upon the eye; but while we should perhaps stop for seconds to admire the gorgeous hues of a cluster of tulips or to enjoy the perfume of a bed of violets, we would certainly give minutes, and many of them, to watching the shrinking of the leaves of the sensitive plant or to examining the strange forms of the aloe or cactus.

In the one case we admire a flower which we know is beautiful, doubtless far more so than the odd plant which attracts our closer attention; but with the one we have always been familiar, and the gratification it affords us is simply to the senses of sight and smell; the other presents the charm of that greatest of wonders, a new vagary of Nature, and arouses a deeper and more intellectual interest, which holds us enchained until we have gratified the curiosity which leads us to new stores of knowledge. For this reason, we think that no garden should be without some odd or queer plant, in the growth and development of which new marvels will be daily unfolded. Of course there are hundreds of species well known to the professional floriculturist, but of which the amateur gardener is comparatively ignorant; and from these, selections may be made which will render one's flower beds a museum of strange and beautiful forms, which will make them a constant source of pleasure and interest.

As specimens of these odd freaks of Nature, the annexed engravings represent plants which, we think, will prove something novel even to the skilled gardeners in this country. We extract the illustrations from that excellent periodical, the English *Garden*. In Fig. 1 is shown a noble sub-tropical plant, called the *Wigandia caracasana*. Its broad leaves are of a fresh green color and very luxuriant, rendering it a beautiful ornament for lawns. It rarely flowers, but produces a large scorpioid enflorescence at the top of a thick fleshy stem. The plant grows quickly in warm soils, and attains a hight of from six to seven feet in a single season. It is easily propagated in the spring by means of cuttings; and if the thick roots are cut off in the autumn, a large proportion of them will form young plants when set out in light sandy earth.

In our second figure is represented one of the hardiest of the ferns, the *Dicksonia antarctica*. The trunk varies considerably in thickness, and in its native country, Aus-

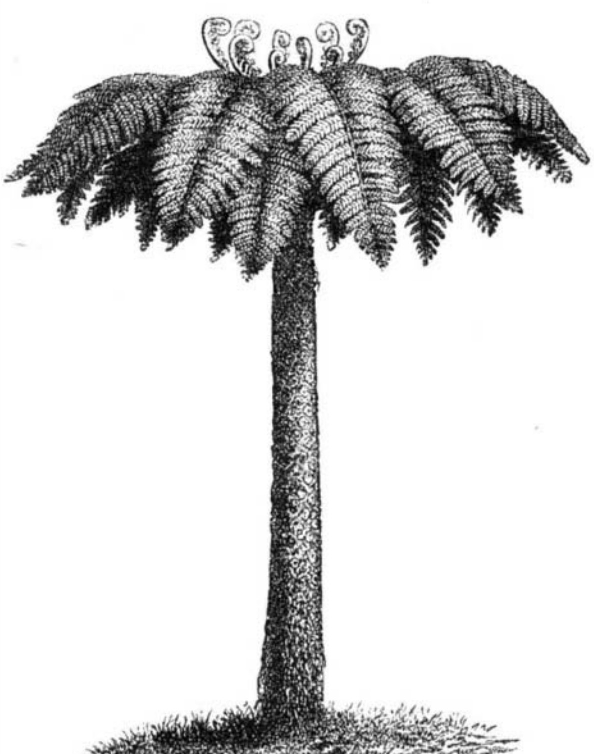

FIG. 2.—DICKSONIA ANTARCTICA.

tralia, attains a hight of thirty feet or more, bearing at its summit a magnificent crown of dark green lance-shaped fronds, from six to twenty feet long, beautifully arched and becoming pendulous with age. The crown itself is frequently ten or twelve feet across, and is evergreen.

In Fig. 3 is another queer but very differently appearing plant, coming from high latitudes in Mexico, and called the *mammillaria sulcolanata*. It grows from five to six inches high. At the base of the mammal is a dense forest of white wool which disappears as the plant gets old. Its flowers are yellow, and one inch and a half in width. They have short bell-shaped blossoms, which rarely protrude beyond the spines, and are produced in whorles.

A very curious plant, known as the *ataccia cristata*, shown in Fig. 4, is a native of the islands of the Malayan archipelago. The underground portion consists of a short and conical root stock, marked with the scars of former leaves, and here and there throwing up some small tubers, by the removal of which it is easily multiplied. The actual roots consist of a few coarse fibers. From the crown of the root stock rise three or four handsome and dark green leaves, and in the midst is a stout scape, like that of a hyacinth, twelve to eighteen inches in hight, bearing on the summit a unilateral umbel of from twelve to twenty brownish purple flowers. With these are many more that are abortive, attenuated to a length of at least twelve inches, and hanging down like thin straight hair, a lock upon each side, while back of all stand up two enormous vertical bracts, and two smaller ones, flattened out and of a cadaverous greenish purple hue. The whole thing is so weird and gipsy-like that one almost starts at the supernatural mockery. It is easily propagated from its tubers.

The *echinocactus myriostigma* (Fig. 5) may be described as a civilized cactus, inasmuch as it has laid aside its spines

FIG. 1.—WIGANDIA CARACASANA.

and other asperities, and put on an elegant attire, bespangled with silver. This little gem (from Mexico) has generally five deep angles, though sometimes they number seven or eight; at the apex, on the margins of the angles, are borne a quantity of silky, yellow, star-like, sessile flowers, which open du-

FIG. 3.—MAMMILLARIA SULCOLANATA.

ring sunshine, and close about four o'clock in the afternoon. They keep expanding for four or five days in succession, according to the intensity of the sunlight, and they last longest when least exposed: the blossoms begin to open in June and continue expanding, at intervals, until October, during which period a good plant will bear from ten to twenty blossoms, one inch and a half in diameter. The ground color of the plant is dark green, and its whole surface is thickly and regularly beset with white star-like scales, which give it a very beautiful appearance, especially under a microscope. Its culture is in no way different from that under which other *echinocacti* thrive, but it must, says Mr. Croucher, not be subjected to a temperature below 40°, otherwise it will be sure to suffer more or less from cold, and will not flower satisfactorily.

FIG. 4.—ATACCIA CRISTATA

In a future issue we shall present engravings of several other curious plants and flowers, which will doubtless prove as interesting as those above described.

A Hunter's Parrot.

A correspondent of the Little Rock (Ark.) *Gazette* sends that paper the following account of a common poll parrot, which, it is claimed, has not only been trained to hunt, but which has learned to take a great delight in the chase. The owner and trainer of this hunting parrot is a boatman, who formerly plied between Little Rock and New Orleans, but who some years since gave up the business of boating and has since led the life of a hunter, living in a snug cabin at the junction of Big Mammelle Creek with the Arkansas river. This hunter hermit, whose name is Nathan Lask, brought with him from New Orleans, on making his last trip to that city, a fine young parrot, to which he soon became more attached than any other thing on earth. Seated upon his shoulders, the parrot attended him in all his walks. To train the bird and talk to it was almost his sole occupation. With the careful training of so loving a master, added to its great natural talent for imitating all manner of cries of birds and animals, this bird has become a marvel of cunning and a great wonder in its way. Taken into the hills bordering Big Mammelle Creek, and the signal being given at intervals, it utters the cry of the turkey so perfectly as to deceive the oldest and most astute gobbler that ever strutted. On being answered by a gobbler, the parrot proceeds to lure him to death in the most fiendishly coquettish manner imaginable. Seated on his master's shoulders, charily and coyly the parrot replies. Once he has fully attracted the attention of the vain and anxious gobbler, often allowing him to call in a fretful tone twice or thrice before deigning to answer; he then, in a few low and tender notes, lures the proud bird of the forest within range of the hunter's deadly rifle. Seeing the turkey struggling in the agonies of death fills the parrot with the most fiendish delight, to which he gives utterance in a succession of blood-chilling "ha has," in all manner of diabolical tones and keys. Should the hunter miss his aim, however, the parrot ruffles his feathers, croaks and scolds, pulls his master's hair, and long refuses to be pacified. Duck hunting in Forche and Meto Bayous is, however, the parrot's chief delight. Seated in the bow of his master's boat, snugly ensconced in

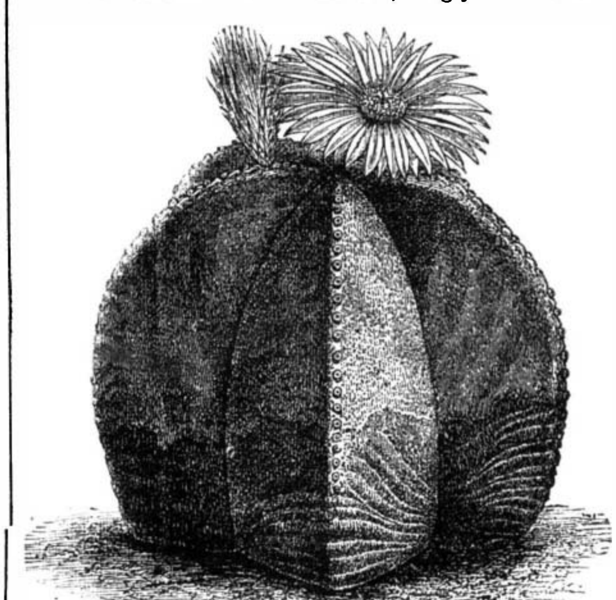

FIG. 5.—ECHINOCACTUS MYRIOSTIGMA.

a patch of tall bullrushes, the parrot bursts forth into such a "quack, quacking," and general duck gabble that there seems to be in the vicinity a whole flock of these birds, all enjoying themselves immensely. Thus are many passing flocks of ducks lured within range of the gun of the hunter. Geese are in the same way called up by the parrot; also many other wild fowl and even deer, as the bird imitates the plaintive bleating of a fawn or doe to a nicety. No money would buy the bird, and Nat. Lask, seen strolling through the woods, gun in hand and with his almost inseparable companion seated on his left shoulder, seems a second Robinson Crusoe. Although so perfect in his imitations of all manner of birds and animals, the parrot is not a great talker; indeed, his vocabulary is limited to a few words and one or two short phrases. He will sometimes sing out: "Nat, you lubber," and when Dan Lanagan (a brother boatman of Nat's, living at the head of Bayou Forche, and almost his only visitor), in his dug-out, is seen paddling in toward the mouth of Big Mammelle Creek, the parrot—whose name, we forgot to say, is Bobby—will shout, "Lanago, ahoy! Lanagan, a-hoy!" The moment Bobby sees his master take down his gun, he is in a great utter. He cocks his head on one side, his [illegible] eyes sparkling with delight, and, in a low, inquiring tone, says: "Turkey? turkey?" "No, Bobby," Nat will perhaps say, "not turkey today." Bobby cocks his head the other way and softly says: "Quack, quack, quack?" "Yes, Bobby," says Nat, "quack, quack!" Bobby then bursts into a loud "ha, ha,ha!" and cries, "Nat, you lubber, quack,quack, quack!" Then he ha has till the whole cabin rings again.

THE FLOW OF SOLIDS AND ITS EFFECT UPON THE STRENGTH OF MATERIALS.

BY PROFESSOR R. H. THURSTON.

One of the most important properties of metals is that which has been carefully and skillfully investigated by M. Tresca, the distinguished "*Sous-Drecteuri du Conservatoire des Arts et Métiers*," and by him called the flow of solids. The important modification produced in the strength of materials by this action is not generally recognized, and has not been considered by standard authorities on this subject.

Professor Henry proved long ago that liquids, which were previously regarded by all, and which are still regarded by many, as destitute of all cohesion, are actually endowed with considerable attractive force, their molecules clinging to each other with a tenacity probably nearly, and perhaps quite, equal to that of ice. The total absence of the force of polarity, which gives the property of solidity, and the perfect freedom from true friction, observed in fluids, prevent the casual observer from detecting the existence of this attraction, and it can only be measured by ingenious artifice and skillfully conducted experiment. In solids, the force of polarity prevents the occurrence of such intermolecular movements, and enables cohesive force to be observed and appreciated; but it is evident that, so long as the power of changing interatomic distances by flow remains, the maximum cohesive resistance of the material cannot become a measure of its tenacity.

It has recently been found that any distribution of material which aids polarity in resisting the tendency of particles to slide among each other, under the action of any straining force, causes a power of resisting external forces to become evident, higher than is noted where the form is such as to permit flow. The real resistance to fracture offered by any piece, as a bolt, for example, is determined by the relative and absolute values of cohesive force and polarity, and the form of the piece, and is not, as has been so generally supposed, a simple measure of the cohesive strength of the substance.

It was shown sometime since, in an illustrated article published in the *Railroad Gazette**, that a piece of boiler plate having rivet holes, whether punched or carefully drilled, was actually weaker per square inch of breaking section than when solid. It has long been known to engineers that short specimens of materials, subjected to test in the standard form of testing machine, exhibited higher tenacity than long specimens of the same material with a uniform cross section. This phenomenon has recently been studied by Mr. C. B. Richards, at Hartford†, and by Commander Beardslee at the Washington Navy Yard, and the results obtained are very similar.

The standard short specimen gives, almost uniformly, about twenty per cent higher resistance to fracture by tensile force than the long specimen, which has a uniform cross section for a length of several times its diameter.

A metal which exhibits a tenacity of 60,000 pounds per square inch when tested in the first form, the minimum area occurring at a single point, will usually resist with a force of but about 50,000 pounds when tested in the form of a long bolt. It is therefore very important to know in what form a specimen of metal has been tested when its so-called tenacity is stated.

The majority of experiments hitherto made and quoted in books and periodicals have been made with short specimens. We are consequently very liable to be led to expect more of our materials than they are really capable of sustaining.

It may be inferred, from what is above stated, that, in construction, we should always be careful to design the parts exposed to strain in such manner that their form should aid in giving resisting power by preventing, as far as may be, a flow of particles and consequent stretch or distortion. This is correct when dead loads are to be carried.

Another inference would be that one large piece is less liable to yield under the attacking force than several small ones of equal total section. It is, however,to be remembered that small pieces are usually better worked and are less affected by internal strain than are large pieces. This is particularly the case with iron and steel, which are far more liable to this last kind of fault than are the other metals. Where the piece is to resist blows, or to sustain live loads, it need hardly be said, it should never be given a contracted section if it can possibly be avoided.

Since the damaging effect of a blow is measured by the product obtained by multiplying the weight of the striking body into the hight from which its fall would have given it its striking velocity, and since the resisting power of the piece receiving the blow is measured by the product of the strength of the material into about two thirds the distance it will stretch before breaking, it is seen that the proper method of forming the resisting piece is that which gives it the best opportunity to stretch to a maximum extent before breaking. This is done by making the greatest possible length of uniform section and seeing that all other portions are somewhat larger.

Thus the best bridge builders in this country make the long bolts, which are used as braces, of uniform sectional area from end to end, except at the very extremities, which are upset for a distance equal to the required length of thread to be cut on them, and this enlarged portion at each end is given such size that the diameter at the bottom of the thread, when cut, shall be somewhat greater than that of the body of the rod.

The amount of flow of the metal is determined by the character of the metal. Hard wrought iron and tool steels, for example, exhibit it less, and are consequently more ductile and resilient, than soft iron and low steels, while the latter are weaker metals than the former. Cast iron is both weak and non-resilient, and is therefore not well fitted to sustain either dead or live loads. The harder metals are not less affected by shape, in their power of resisting shock, than are the softer grades, and where it becomes necessary or advisable to make use of them under such circumstances, the same care should be taken to avoid concentrating the straining action on a short portion, or upon a single plane of cross section.

It often happens in designing machinery, that pieces are necessarily made of such shape as to be liable to injury from the cause here considered. Should this danger appear serious, the designer might be justified in changing his whole plan to avoid such risk.

A connecting rod, as usually made, is an illustration of a piece unfitted by its shape to bear a blow. The less the taper of the rod, the less is its liability to yield to shock. To secure in any given case a form of rod that shall best combine power of resisting shock with maximum endurance under heavy strain is often an important problem. The spring of the rod will often take up excessive strains, due to accidental and excessive blows caused by the piston striking upon water in the cylinder or by other exceptional occurrences.

The body of a piston rod being of uniform section, it is well fitted to meet either static or dynamic compressive stress, but it is so seriously weakened at each end by the taper given it in fitting it to piston and crosshead, and by the slots cut through it, that it is usually quite unfit to offer maximum resistance to shock in tension.

To resist perfectly steady strain, therefore, and to carry dead loads, we should always select the strongest material, rather avoiding ductility, and, where the minimum section occurs, make that as short as possible and of such form as shall best resist flow and change of shape.

To resist percussive action and to sustain live loads, we should select that material which is at once the strongest and most ductile, avoid brittleness as certain to produce danger, and make the piece of such form as shall allow the greatest possible stretch before breaking.

Where two materials have products of strength into elongation which have the same magnitude we would select the most tenacious. Where two materials are equal in other respects, we would select that which has least density, since it is less likely to produce a concentration of the effect of the shock near the point at which the blow is struck.

STEVENS INSTITUTE OF TECHNOLOGY.

* Railroad Gazette.

† rans. Am... E.

Plant Trees.

Mr. Reuben Shelmandine, of Jefferson, N. Y., is evidently a philanthropist, and he proves his love for mankind in general by issuing a proclamation to farmers. Why he should embody a number of very useful hints about transplanting trees in this highly official document, we cannot explain. Suffice it that the writer says that he has had an experience of twenty years on a farm, and "not on a side walk," and that his remarks are practical. Transplant, he says, finest or standard fruit trees, some in the fall and some in the spring, until you have from 10 to 50 trees growing. No tree should stand nearer a building than twenty feet, and the trees should be about twenty feet apart throughout the entire grove or orchard. Establish forest trees along the road and the front yard, and fruit or forest trees on other sides of the house. Sugar maple, commonly named hard maple, is preferable of forest trees, and thrifty, hardy apples or pears, or both, of the standard (not dwarf) kinds.

Ornamental trees should be trimmed during the first few years, leaving the main shoot to form the trunk of the tree, in order to have the branching lower limbs of the final tree from six to seven feet from the ground. The land in such an orchard grove can be cultivated for all ordinary crops, including a garden, by plowing shallow and carefully near the trees.

It is suggested that the first ten trees be planted on the south side of the house, if none be there already.

If a wind break is wanted on the west, northwest, or southwest, plant as near together as possible and have a part of the trees evergreens, to complete the thicket. The forest and fruit trees, arranged about twenty feet apart, as above described, will be estimated by the owner or other persons at the expiration of five years from the time of planting to be worth at least five dollars each, and at the expiration of ten years at ten dollars each, with an increasing value thereafter.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From April 14 to April 16, 1874, inclusive.

BOILER AND FURNACE.—D. Renshaw, Hingham, Mass.
HORSE COLLAR LINING.—D. Curtis *et al.*, Madison, Wis.
LEATHER DRESSING MACHINE.—J. M. Caller, Salem, Mass.
NEEDLE.—W. Trabue, Louisville, Ky.
PUMP.—W. D. Baxter, New York city.
TEMPERING APPARATUS.—G. F. Simonds, *et al.*, Boston, Mass.
WASHING MACHINE, ETC.—E. Marshall, Tola, Kansas.

DECISIONS OF THE COMMISSIONER OF PATENTS.

PATENT TOBACCO BAG.—JAMES D. CULP.—Appeal.

[Appeal from the decision of the Board of Examiners-in-Chief in the matter of the application of James D. Culp, for patent for Improved Tobacco Packages.—Decided April 15, 1874.]

LEGGETT, *Commissioner:*

Applicant claims—

1. The use of elastic knit or loosely woven tobacco sacks, substantially as herein described, for packing tobacco.

2. As a new article of manufacture, elastic tobacco sacks made of knit or loosely woven fabrics, substantially as herein set forth and described.

Heretofore sacks for containing small quantities of granulated tobacco to be sold at retail in small packages, have been made of woven fabric, pieces being cut out, folded, and sewn at one side and one end to form the sack.

In packaging the tobacco it is pressed into a metallic tube, over the end of which the bag is slipped to receive the tobacco as it is forced out of the tube.

Applicant proposes to knit long tubes of the diameter of a tobacco package and cut them into suitable lengths to form tobacco sacks, and merely sew them across the bottom. The novelty of this plan of making tobacco sacks is admitted, but the Board hold that, as it is common to knit tubular fabric for stockings and purses and cut it into proper lengths and sew up one end, there is no invention in making a tobacco sack in this manner.

The following points are made by the applicant against the soundness of this opinion. He says his sack can be manufactured with less expense than the old sack, because it requires less sewing. But this advantage is due solely to the method employed in its manufacture, which, broadly considered, is old. Laying aside the method, which, although it has never been employed before to make tobacco sacks, has been used to make purses and stockings, and considering the alleged qualities and advantages of the finished article, it is said, first, that on account of its elasticity it will readily fit the metallic tube, even if there is some variation in its size, and thus the waste of misfitting sacks, which occurs in the use of the unyielding woven fabric, is avoided; second, the danger of giving way at the side seam, which is incident to the sacks at present employed, is obviated; third, and more important, the sacks adapt themselves to the sizes and shape of the packages, requiring nothing but the draw string to smoothly close their mouths for the reception of the revenue stamp, and the ordinary seam across their bottoms to smoothly close them, while the common cloth bags require extra sewing and pressing after the tobacco is put in them.

That the sack, for the use contemplated, is a new and superior one is clear and it is the object of the law to promote the production of new and improved articles for the use of the public.

Very little analogy appears between a stocking or purse and a sack for a tobacco package.

Decision of the Board reserved and a patent allowed to the applicant.

RIGHTS OF EMPLOYERS AND EMPLOYEES TO INVENTIONS.

GILBERT, AND CLARK, BONZANO & GRIFFEN.—INTERFERENCE.—ELEVATED RAILWAY PATENT.

[Appeal from the decision of the Board of Examiners-in-Chief in the matter of the interference between the application of Rufus H. Gilbert, and Clarke, Bonzano & Griffen, for patent for Improvement in Elevated Railways.—Decided April 16, 1874.]

LEGGETT, *Commissioner:*

The invention in controversy is an elevated street railway. Such a means of transit in large cities has long been a project of absorbing interest to the applicant, Dr. Gilbert.

With such a scheme more or less developed in his mind, he went to the firm of Clarke, Bonzano & Griffen, at Phœnixville, Pennsylvania, distinguished engineers and bridge builders, to enlist their skill and services in its practical furtherance. It is admitted that the widespread reputation of this firm as engineers and bridge constructors led to those business transactions between the parties from which this controversy sprung. That Dr. Gilbert freely communicated to them his ideas and plans as far as he had perfected them, and that they were prompted to the consideration of the subject by his suggestions, cannot be doubted. How far he had matured the structure of the device in his own mind is somewhat uncertain. It is clear, however, that he had not perfected all the details, and probably could not have done it. But that he had conceived this much, that he must have supporting columns, an arch of some kind properly elevated, and a track bed properly supported and far enough beneath to admit of the passage of steam cars under the arch, all of sufficient strength for the purpose contemplated, is certain. The very conception of the idea of an elevated steam railway over the center of a street, which would not obstruct travel, must have suggested this much, especially when a transition was made from the pneumatic structure which he had already planned and pictured. Fugitive sketches made in the course of conversations were not preserved, but they were not important to establish the existence of the general idea of the structure embodying the invention claimed. There is sufficient proof to carry conviction without them.

Gilbert needed and sought the practical suggestions and instructions of skilled mechanics and engineers. They could and did tell him that a gothic arch would not do. They probably told him, as all other engineers would have told him, that he must provide for expansion and contraction, and without making any invention they could readily suggest how it should be done. They no doubt informed him also with reference to the strength of the material, and how braces and diagonal and vertical tension rods could be advantageously employed. Whether these were suggested by him or by them is immaterial. All this and much more any practical bridge builder would inform an inventor for the furtherance of his general plan, and it is perfectly legitimate for him to invoke such aid.

Mechanical skill and professional knowledge may always be sought without jeopardizing inventions, because, in fact, an inventor can seldom perfect his conceptions without them.

As to what transpired at the interview of Foster and Gilbert with the firm of engineers upon whom they called and whom they consulted, among the somewhat conflicting accounts the following testimony of Foster appears to be a conscientious and reliable summary. He says, in substance, pencil sketches were made to illustrate the requirement of construction by Dr. Gilbert and himself; some were also made by Mr. Bonzano and Mr. Griffen. They were illustrative of detail and arrangement. Illustrative suggestions were made by all the parties present, none of which he could fix upon one or the other. The consultation here indicated was such as would naturally take place at such an interview. It does not go to show that Clarke, Bonzano & Griffen were inventors. The prospect of a contract to build for the Gilbert Railway Company was sufficient to induce them to perform the services sought of them by Dr. Gilbert. That was doubtless the consideration upon which they acted for him at his request. He presented the idea of the invention and they promptly assisted to render it practicable, because of the inducement of ultimate profit to be derived from it as employees in the line of their profession.

The relation of employer and employee was essentially established between the parties. That being the case, admitting all that is claimed to have been suggested by Clarke, Bonzano & Griffen, I cannot see that they have any claim to independent inventorship.

Decision in favor of Gilbert.

DECISIONS OF THE COURTS.

United States Circuit Court—District of Massachusetts.

PATENT ELASTIC FABRIC.—WILLIAM SMITH *vs.* THE GLENDALE ELASTIC FABRICS COMPANY.

[In equity.—Before Shepley, Judge.—Decided February 13, 1874].

The previous production to a limited extent of goods resembling those fabricated by the plaintiff's process, and by means somewhat similar, held to have amounted to no more than abandoned and unsuccessful experiments, and not to impeach the validity of his patent.

SHEPLEY, *J.:*

This is a bill in equity founded on alleged infringement of letters patent reissued to the complainant, numbered, respectively, 2,843 and 2,844.

Ferdinand Doebly and Henry G. Gurney, witnesses in behalf of the defendants, testify to the use of looms with stationary warps before the date of complainant's invention. Neither of them give any drawing or model of the looms to which they testify, nor do the witnesses themselves or any experts in the case testify that the mechanism described by them was substantially like that described by the complainant in his specification. In the case of Gurney only a trifling quantity of the elastic web was made in the loom described by him. It is not easy to determine from the testimony how much of the product which Doebly says was made for his father was made on the loom with a stationary warp. I think they are to be regarded in the light of abandoned, and, judging from the specimens of the work filed as exhibits in the case, as unsuccessful, experiments before the date of complainant's invention. There is considerable testimony in the case tending to show that the elastic webbing can be well made by the use of a rising and falling rubber warp. Machinery operating in that way is open to be used without infringing the complainant's patent. The fact that respondents prefer to use the mechanism patented to complainant is evidence that there is sufficient utility in the invention to support a patent.

Decree for complainant.

[*T. A. Jencks* and *L. Scott*, for complainant.

Benjamin Dean, for defendants.]

United States Circuit Court.—District of Massachusetts.

WADE H. HILL *et al. vs.* G. H. WHITCOMB *et al.*

[In equity.—Before Shepley, Judge.—Decided February 13, 1874.]

The Court held as follows:

Shepley, Judge:

The Allen Manufacturing Company, being the owners of the rights secured by three different letters patent of the United States, for the inventions of Edwin Allen in improvements in printing presses, on the 1st of February, 1871, entered into a certain contract with the complainants. This bill is brought to enforce the rights of the complainants under that contract.

The contract begins with a recital that the Allen Manufacturing Company are the owners of a patent automatic envelope printing press, which they styled a patented automatic envelope printing press, in the organization of which were included the inventions secured. "The exclusive right to use and vend said presses in the county of Worcester and in the State of Rhode Island" is granted to Hill, Devoe & Co., the complainants, the Allen Manufacturing Company reserving for themselves "the exclusive right to manufacture said presses.

The second clause provides that the company shall, within a reasonable time, supply all presses ordered by complainants. The third clause is a covenant to protect and defend the complainants in the exclusive use and enjoyment of the said automatic envelope printing presses in the territory aforesaid.

The fourth clause provides for the payment by complainants of the sum of one thousand dollars for each press ordered and received by them, and of a royalty of one dollar per day on each press on which envelopes can be printed of size No. 6, and corresponding royalties for other sizes" when said parties of the second part shall be protected in the exclusive use and enjoyment of them according to this agreement."