THE PROPOSED CHANGES IN THE PATENT LAW.

We subjoin a full copy of the proposed changes in the Patent laws which are now before Congress for its legislation. Some of our readers will doubtless recognize in this bill the lineaments of an old familiar friend, for, with the exceptions of Sections 10 and 11, it is almost, word for word, the same as that brought before Congress in 1858, and at that time published in the SCIENTIFIC AMERICAN. See Vol. XIII. (old series), page 222.

To the leading features of the bill of 1858 we gave our assent, though it contained some objectionable provisions. We then refrained from entering upon any minute criticism of its merits, because the objections were of a minor character; and because the bill, as a whole, was good, while the chances for its passage were at best very slim. Since that time, however, patent property has risen in value; the number of new inventions patented has greatly increased; and the public, and public men, have manifested a greater interest in patent matters than was ever before observable. We are therefore constrained to believe that there is a real disposition in the present Congress to make such reforms in the laws as may seem to be positively necessary.

The Patent laws now in force are about as complete and perfect, in their practical operation, as any that were ever devised for a similar purpose. Within only fifteen years the receipts of the Patent Office have risen from $40,000 to $240,000, and the number of patents annually granted has increased from 500 to 4,500. What better evidence could there be of the practical excellence of the current system than facts like these? When, year by year, we witness the wonderful strides in improvements which our people are making, under the auspices of these same Patent laws, why should we ask for any changes? Why not "let well enough alone"? These are questions that will at once suggest themselves to the mind of every patriotic legislator. We have no idea that the present Congress will pass any bill without the most thorough examination of its provisions, and a most rigid pruning of its excrescences.

The bill now presented is designed, for the most part, to facilitate the Patent Office in the execution of the present laws, by providing the necessary means for properly conducting the greatly increased business which these laws have brought to its doors. We should be satisfied if the scope of the bill were wholly confined to this object. But certain other amendments have been added which will do good if adopted, and still others which it would be wise to reject.

We annex the bill, and, section by section, we have interposed brief suggestions under each, so that, as they pass in review, our readers may have a correct understanding of the changes proposed and their probable effects.

NOTE.—The words enclosed between brackets denote the original phraseology of the bill, and the words printed in *italics* indicate the clauses substituted as amendments.

A BILL

IN ADDITION TO "AN ACT TO PROMOTE THE PROGRESS OF THE USEFUL ARTS."

Section 1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the Commissioner of Patents may establish rules for taking affidavits and depositions required in cases pending in the Patent Office, and such affidavits and depositions may be taken before any justice of the peace, or other officer authorized by law to take depositions to be used in the courts of the United States, or in the State courts of any State where such officer shall reside; and in any contested case pending in the Patent Office it shall be lawful for the clerk of any court of the United States for any district or territory, and he is hereby required, upon the application of any party to such contested case, or the agent or attorney of such party, to issue subpoenas for any witnesses residing or being within the said district or territory, commanding such witnesses to appear and testify before any justice of the peace, or other officer as aforesaid, residing within the said district or territory, at any time and place in the subpoena to be stated; and if any witness, after being duly served with such subpoena, shall refuse or neglect to appear, or, after appearing, shall refuse to testify (not being privileged from giving testimony), such refusal or neglect being proved to the satisfaction of any judge of the court whose clerk shall have issued such subpoena, said judge may thereupon proceed to enforce obedience to the process, or to punish the disobedience in like manner as any court of the United States may do in case of disobedience to process of subpoena and testificandum issued by such court; and witnesses in such cases shall be allowed the same compensation as is allowed to witnesses attending the courts of the United States: *Provided*, That no witnesses shall be required to attend at any place more than forty miles from the place where the subpoena shall be served upon him to give a deposition under this law: *Provided, also*, That no witness shall be deemed guilty of contempt for refusing to disclose any secret invention made or owned by him: *And provided, further*, That no witness shall be deemed guilty of contempt for disobeying any subpoena directed to him by virtue of this act, unless his fees for going to, returning from, and one day's attendance at the place of examination shall be paie or tendered to him at the time of the service of the subpoena.

The propriety of compelling the attendance of witnesses in patent cases was so fully discussed and endorsed in our last number that no further remark is now necessary.

Sec. 2. *And be it further enacted*, That, for the purpose of securing greater uniformity of action in the grant and refusal of Letters Patent, there shall be appointed, in the same manner as now provided by law for the appointment of examiners, a board of three examiners-in-chief, at an annual salary of three thousand dollars each, to be composed of persons of competent legal knowledge and scientific ability, whose duty it shall be, on the written petition of the applicant for that purpose being filed, to revise and determine upon the validity of decisions made by examiners when adverse to the grant of Letters Patent; and also to revise and determine in like manner upon the validity of the decisions of examiners in interference cases, and to perform such other duties as may be assigned to them by the Commissioner; that from the decisions of this board appeals may be taken to the Commissioner of Patents in person upon payment of the fee hereinafter prescribed; that the said examiners-in-chief shall be governed in their action by the rules to be prescribed by the Commissioner of Patents. No appeal shall hereafter be allowed from the decision of the Commissioner of Patents, except in cases pending prior to the passage of this act.

So onerous have the duties of the Commissioner become, under the pressure of the increased business, that of late he has been compelled to call to his assistance three of the most experienced Examiners in the department, and they constitute what is now known at the Patent Office as the "Board of Appeals." The Board hears and reads all the cases that were formerly heard personally by the Commissioner, thus relieving him from a service that has become physically impossible for him to discharge. The Board reports to the Commissioner, who confirms or rejects its decisions. The above section, so far as it gives public recognition and permanence to this Board, and increases the salaries of its members, is judicious, and its adoption is much needed. But we see no propriety in burdening the Board with the additional labor of deciding interferences, when it is *barely able to keep pace with the business of rejected cases*. A second Board, confining its duties solely to the decision of interferences, might perhaps be profitably employed.

Nor do we see the propriety of exacting a fee of $20 for an appeal to the Commissioner in person. The applicant enjoys that advantage now, in substance, and, assisted by the Board, the Commissioner has so far experienced no difficulty whatever in disposing of all the appeal cases.

We are likewise unable to see any good reason for depriving the applicant of the right which he now enjoys, of taking an appeal to the judges of the District Court, in Washington City. These judges are appointed for life. They are not subject to the whims of political partizanship, nor are they governed or influenced by the fluctuating opinions upon patent law which float in the atmosphere of the Patent Office. But removed from the excitements, cares and interruptions of the department, in the quietude of their own homes, the judges examine and carefully decide the cases that are sent to them, on appeal, by the Commissioner. Interests of momentous importance to the inventor reach a final solution in their hands. Many errors committed by the Patent Office have been brought to light and corrected by this method of appeal. Justice, which Commissioners have erroneously refused, has been promptly obtained at the District Court. This system of appeal works well and gives general satisfaction. Why deprive the inventor of so efficient and inexpensive a safeguard of his rights?

It is alleged that the Commissioner and other officials are put to much inconvenience by being compelled to send the models and papers in appeal cases out of the Office to the judges' chambers. But we think that much of the inconvenience complained of has been occasioned by the Patent Office itself in making stupid and unjust decisions. If the Commissioner and his subordinates would pay closer attention to the mandates of the judges, there would be more uniformity in decisions and less trouble occasioned to all the parties concerned. Courts of Appeal are commonly maintained for the express purpose of giving uniformity to the decisions of the lower courts. But the above section is based upon the absurd expectation of obtaining uniformity by abolishing the right of appeal, and *allowing each Commissioner to be the final arbiter of his own decisions*. Past experience shows that this is the very way to induce non-uniformity. Multitudes of instances might be cited where Commissioners have decided one way on one day and just the contrary at another time—where the decisions of the incumbent of to-day have been disregarded by his successor on the morrow. So long as the Commissionership is used as a political bait or as a reward for partizan zeal, subject to constant change of persons, and held by the same individual for only a few months at a time, how can uniformity of decisions be, by any possibility, maintained, except through the medium of a final appeal to some authority other than that of the Commissioner, like that which the law now gives?

Sec. 3. *And be it further enacted*, That no appeal shall be allowed to the examiners-in-chief from the decisions of the primary examiners, except in interference cases, until after the application shall have been twice rejected; and the second examination of the application by the primary examiner shall not be had until the applicant, in view of the references given on the first rejection, shall have renewed the oath of invention, as provided for in the seventh section of the act entitled "An act to promote the progress of the useful arts, and to repeal all acts and parts of acts heretofore made for that purpose," approved July fourth, eighteen hundred and thirty-six.

This section re-enacts what is already in vogue. Under the present rules of the Patent Office, the case must have been twice rejected, and the oath renewed, before an appeal can be taken.

Sec. 4. *And be it further enacted*, That the salary of the Commissioner of Patents shall [from and after the commencement of the present fiscal year] be [five thousand dollars] *four thousand five hundred dollars* per annum, and the salary of the chief clerk of the Patent Office shall be [the same as that of principal examiner] *two thousand five hundred dollars per annum.*

The present salary of the Commissioner is $3,000 per annum. For these days of expensive living, the proposed increase is little enough.

Sec. 5. *And be it further enacted*, That the Commissioner of Patents is authorized to restore to the respective applicants, or when not removed by them, to otherwise dispose of such of the models belonging to rejected applications as he shall not think necessary to be preserved. The same authority is also given in relation to all models accompanying applications for designs. He is further authorized to dispense in future with models of designs when the design can be sufficiently represented by a drawing.

There are nearly as many rejected models stored at the Patent Office as patented. The building has been quadrupled in size within ten years; but the number of models received has been in a far greater ratio than the increased space provided. The rejected models are of no use to any one but the owners, who, in most cases, want them returned. The removal of these models has become a positive necessity. By all means, adopt this section.

Sec. 6. *And be it further enacted*, That the tenth section of the act approved the third of March, eighteen hundred and thirty-seven, authorizing the appointment of agents for the transportation of models and specimens to the Patent Office, is hereby repealed.

The Commissioner of Patents is hereby authorized to employ a clerk of the third class to frank such letters and documents as he is by law permitted to frank, and to perform such other duties as the Commissioner may assign him.

The Commissioner is further authorized, from time to time, to appoint, in the manner already provided for by law, such an additional number of principal examiners, first assistant-examiners, and second assistant-examiners, as may be required to transact the current business of the Office with dispatch, provided the [annual expenses of the Patent Office shall not exceed the annual receipts] *whole number of additional examiners shall not exceed four of each class.*

We say amen to all of this. Let the Patent Office be well provided with help, so that all applicants shall have their cases promptly disposed of. With this additional aid, the Examiners will be better able to attend to the interferences than the present Board.

Sec. 7. *And be it further enacted*, That the Commissioner of Patents may require all papers filed in the Patent Office to be correctly, legibly and clearly written; and for gross misconduct he may refuse to recognize any person as a patent agent, either generally or in any particular case; but the reasons of the Commissioner for such refusal shall be duly recorded, and subject to the approval of the President of the United States.

The Commissioner already has power to require all papers to be correctly, legibly and clearly written. No further legislation is wanted on that point. As to gross misconduct on the part of agents, the Patent Office, instead of asking for Congressional aid, should seek the assistance of the local Chief of Police. The instances of gross misconduct are exceedingly rare.

Sec. 8. *And be it further enacted*, That no money paid as a fee on any application for a patent after the passage of this act shall be withdrawn or refunded, nor shall the fee paid on filing a caveat be considered as part of the sum required to be paid on filing a subsequent application for a patent for the same invention.

That the three months' notice given to any caveator, in pursuance of the requirements of the twelfth section of the act of July fourth, eighteen hundred and thirty-six, shall be computed from the day on which such notice is deposited in the Post-office at Washington, with the regular time for the transmission of the same added thereto, *which time shall be indorsed on the notice;* and that so much of the thirteenth section of the act of Congress, approved July fourth, eighteen hundred and thirty-six, as authorizes the annexing to Letters Patent of the description and specification of additional improvements is hereby repealed.

The existing law permits rejected applicants to withdraw two-thirds of the official fee. But very many never avail themselves of the provision, hoping some time to get their patents through. A hundred thousand dollars and over, due to rejected applicants, remains, and has remained for years, uncalled for at the Patent Office. This section should be adopted.

Sec. 9. *And be it further enacted*, That all laws now in force fixing the rates of the Patent Office fees to be paid are hereby repealed, and in their stead the following rates are established:

On filing each caveat, ten dollars:

On filing each original application for a patent, except for a design, twenty [five] dollars;

On issuing each original patent, [five] *ten* dollars;

On every appeal from the examiners-in-chief to the Commissioner, twenty dollars;

On every application for a patent for a design, fifteen dollars;

On every application for the re-issue of a patent, thirty dollars;

On every application for the extension of a patent, [one hundred] *fifty dollars; and fifty dollars, in addition, on the granting of every extension;*

On filing each disclaimer, ten dollars;

For certified copies of patents, and so forth, twelve cents per hundred words;

For recording every assignment, agreement, power of attorney, and so forth, of three hundred words or under, one dollar:

For recording every assignment, and so forth, over three hundred and under one thousand words, two dollars;

For recording every assignment or other writing, if over one thousand words, three dollars;

For copies of drawings, the reasonable cost of making the same.

The principal change contemplated by this section is the establishment of a uniform rate of charge to all applicants for patents, *without regard to nationality*. We believe that all civilized governments except Canada and the United States have a uniform rate. In Great Britain, France, Austria, Australia, Russia, Prussia, &c., an American can obtain a patent on the same terms as any of the citizens of those countries. But in Canada, none but a resident John Bull can obtain a grant at all; while in the United States, we charge our own citizens $30; a Frenchman, German, Pole or Austrian, $300; and an Englishman—a son of our mother-land, whence we derived our system of Patent laws—$500. This is a most odious discrimination, and is a foul blot upon our national escutcheon. We ask for its immediate removal.

Sec. 10. *And be it further enacted*, That in all cases where an application shall be made for a patent which would interfere with any other patent for which an application may be pending, or with any unexpired patent which shall have been granted, the person who, previous to the application of either party, for a patent, first filed a caveat describing the invention, in accordance with the provisions of the twelfth section of the act of Congress entitled "An act to promote the progress of the useful arts, and to repeal all acts and parts of acts heretofore made for that purpose," approved July fourth, eighteen hundred and thirty-six; and in case no caveat has been so filed, the person who first completed and presented to the Commissioner his application for a patent for such invention shall, as between said interfering applicants, be deemed and held to be the first and original inventor thereof, unless it be shown by the testimony submitted that said person was not *an original and bona-fide inventor* of said invention, or that he obtained the knowledge of said invention directly or indirectly from some other person: *Provided*, nothing herein contained shall effect any interference case now pending.

One of the practical workings of the plan contemplated in Section 10 may be illustrated by supposing that two inventors arrive in Washington with a similar invention, and simultaneously start from the hotel for the Patent Office. Mr. Nimblefoot, young and active, rapidly skips over the pavement, mounts the marble steps of the department, files his caveat, pays the fee, and makes his exit. Five minutes later Mr. Deepthought arrives, having been unable, through bodily infirmity (being a little lame), to keep pace with his more fleet companion. But now the doors are shut. The hour of 3 has struck; the official sun has set. Too late by five minutes! Fruitless is the toil of the midnight hour, and blasted the fondest hopes of life. The inexorable law awards the patent to Nimblefoot, leaving Deepthought to struggle in the depths of despair.

The present law is, that on the filing of a caveat, and during its pendency, the caveator shall be entitled to due notice of any application that may be made for a patent for a similar device, that the said application shall be postponed until the caveator has had time to put in a model and full specification; after which, interference is to be declared and whoever proves priority of invention shall receive the patent. This is a good law, works well, produces no confusion, and is calculated to do even-handed justice to the inventor and all concerned.

The courts, under the existing laws, hold that in a race of diligence, he is the prior inventor who first *reduces the thing to actual practice*; but the proposed new section declares that he who contrives first *to slip in a caveat*, "shall be deemed and held to be the first and original inventor." The odds are thus all thrown in favor of Mr. Nimblefoot, at the expense of the more plodding men of genius, the future Whitneys, Morses, and McCormicks.

The adoption of Section 10 would certainly greatly lessen the duties of the officials in the Patent Office. But if this is the prime object sought, we might better go back to the old system of granting patents without examination. The object of our present law is to endeavor to allow no patents to issue but such as are valid and will be sustained by the courts. For this purpose labor and expense are freely encountered; and the cases are closely scanned to ascertain, if possible, whether the patent sought will be of any value to the patentee, or whether, by granting the patent, the Office is conferring upon him the worthless privilege of bringing suits which can never be sustained. One thing, at least, seems very clear to us; and this is that the rules observed in the Patent Office should be followed by the courts. Why should one rule prevail in granting a patent and another in sustaining it? If there is danger of perjury in the Patent Office, there is (or ought to be) the same danger in the courts. Evidence ought to be taken in both cases under the same solemnity, and perjury punished by the same penalty. If, therefore, the patent is to be granted to him who first files his caveat or first makes his application, the courts should follow the same rule and hold all such patents valid, irrespective of the question of priority of invention. But should he who files his application on Monday have such an advantage over him who, from remoteness of distance or any other cause, happened to be so unfortunate as not to present his case till Tuesday? Or should he who, before he completes his invention, hastens to the Office with his caveat, be so much more favored than he who, more cautious and particular, shall wait till he has completed his invention before he applies to the Office, irrespective of the date of the actual invention? Such is not the dictate of our own reason on the subject. The same objection suggests itself to our minds against having this kind of property to be decided by the result of a scramble as would exist in regard to any other property. In all cases it seems more in accordance with the rules and practices observed by those nations who have advanced beyond the savage state, that something besides the fact of mere actual possession should be taken into the account in determining the rights of contesting parties. Nor does there seem to us anything in the nature of this species of property that should make it an exception to the general rule on this subject. A patent for an invention actually made should not be defeated by the discovery of some forgotten suggestion which was never made practically useful; nor should a person be allowed to claim priority of invention over a patentee of two years' standing. But, still, to leave the matter entirely dependent upon the date of the application to the Patent Office, seems to us wholly unjust and inexpedient. It would be giving an undue advantage to him who resides nearest to the Patent Office, or who best understood the law or the rules on this subject, or who was the most venturesome in risking his money while the success of his contrivance was still uncertain. At least a reasonable time should be given to an inventor for quietly and cautiously completing the invention and presenting his application before any prejudice is wrought to him on the ground of negligence. The law should encourage the doing of all these things in an orderly and quiet manner. Nor does it seem to us that the amount of litigation is to be diminished by the proposed change. The best mode of preventing litigation is to provide, in the first instance, for securing justice. If a patent is granted to the first applicant without allowing inquiry whether he was the first inventor, the courts must either declare the patent good although the patentee was not the first inventor, or they must permit proof of prior invention to defeat the patent given to the first applicant. The former of these two courses cannot be pursued without a radical departure from all the rules observed on this subject by all civilized nations. The latter would be providing the same harvest of litigation that would result from the granting of patents without examination or question. The Office would not have attempted to separate the good from the bad by the application of those rules which will prevail in the courts when they have the patents before them on questions involving their validity, and the disposition to call in question that validity would not be counteracted in the least by the moral effect of an official decision. We have confidence in the intelligence of Congress, when they have once fairly taken the subject into consideration; and with the alteration of the law of evidence, as proposed in Section 1, we are fully of the opinion that Section 10 should be discarded, and that the Office should look into the date of an invention, guided by the same rules as will afterwards control the courts.

We reiterate that the present laws in regard to caveats, in regard to the filing of applications for patents, in regard to interferences, and in regard to the settlement of the question of priority of invention, are founded in wisdom, are working with success, are free from the objections connected with Section 10, give general satisfaction, and therefore should not be materially changed.

Sec. 11. *And be it further enacted*, That any citizen of the United States, or alien who has resided therein one year prior to the application herein mentioned, who shall make, or cause to be made, at his or their own cost and expense, by modeling, carving, engraving, forging, or chasing, in any material, a new and original pattern or die, or set of new and original patterns or dies, from which articles may be multiplied by moulding, casting, electrotyping, or other analogous means for copying the original, or forming a reverse thereof, shall, on depositing with the Commissioner of Patents a specimen, accompanied by an application and oath or affirmation of the applicant that he is the legal proprietor of the pattern or die, or sets thereof thus produced, together with a certificate of deposit in the treasury of the United States of a fee of ten dollars, it shall be the duty of the Commissioner of Patents to have the same duly registered and numbered, and the specimens preserved in the Patent Office until the term of the registry expires, and to deliver to said applicant a certificate of such registry conferring upon him and his legal representatives the exclusive right to multiply and sell copies of said pattern or die, or sets thereof, for the term of fourteen years, under the same restrictions and penalties for infringement as are now provided for in cases of infringement of Letters Patent for inventions in the useful arts: *Provided*, That upon each of the articles or copies thus protected there shall be marked the letter "R," enclosed in a geometrical figure, as indicated upon the certificate of registry.

If this section is especially designed to protect our home manufacturers, the usual requirement as to having taken the oath of intended citizenship should be inserted. This section seems to be, in effect, an extension of the life of design patents from 7 to 14 years. The spirit of this section is liberal and its adoption might prove beneficial.

Sec. 12. *And be it further enacted*, That all applications for patents shall be completed and prepared for examination within two years after the filing of the petition, and in default thereof, they shall be regarded as abandoned by the parties thereto; and all applications for the extension of patents shall be filed at least ninety

days before the expiration thereof; and notice of the day set for the hearing of the case shall be published, as now required by law, for at least sixty days.

The existing law touching abandonment, as we have before remarked, covers the whole ground, gives satisfaction, is well understood, insures justice, and needs no change. The proposed change of time on extension notices from 60 to 90 days, amounts to a deprivation of one month to the inventor. It is an unnecessary alteration, and its effects would sometimes be to debar a meritorious applicant from obtaining an extension, which the law, as it stands, would readily grant him.

Sec. 13. *And be it further enacted*, That in all cases where an article is made or vended by any person under the protection of Letters Patent, it shall be the duty of such person to give sufficient notice to the public that such article is so patented, either by stamping thereon the word patented, together with the day and year the patent was granted; or when, from the character of the article patented, that may be impracticable, in the judgment of the Commissioner of Patents, by enveloping one or more of said articles, and affixing a label to the package, or otherwise attaching thereto a label on which the notice, with the date is printed; on failure of which, in any suit for the infringement of Letters Patent by the party failing so to label or stamp the article the right to which is infringed upon, no damage shall be recovered by the plaintiff, except on proof that the defendant was duly notified of the infringement, and continued after such notice to make or vend the article patented. And the sixth section of the act entitled "An act in addition to an act to promote the progress of the useful arts" and so forth, approved the twenty-ninth day of August, eighteen hundred and forty-two, be, and the same is hereby, repealed.

This is intended as a substitute for that section of the existing law which fines a patentee $100 for each patented article that he vends without having stamped the date of the patent upon the article. The change proposed is a good one.

Sec. 14. *And be it further enacted*, That every caveat filed in the Patent Office shall, from and after the expiration of the time in which the caveator is protected thereby, become a part of the public records of said office.

This proviso throws open to the public all expired caveats. At present they are preserved in the secret archives of the Patent Office.

Sec. 15. *And be it further enacted*, That all acts and parts of acts heretofore passed which are inconsistent with the provisions of this act be, and the same are hereby, repealed.

EARLY VEGETABLES.

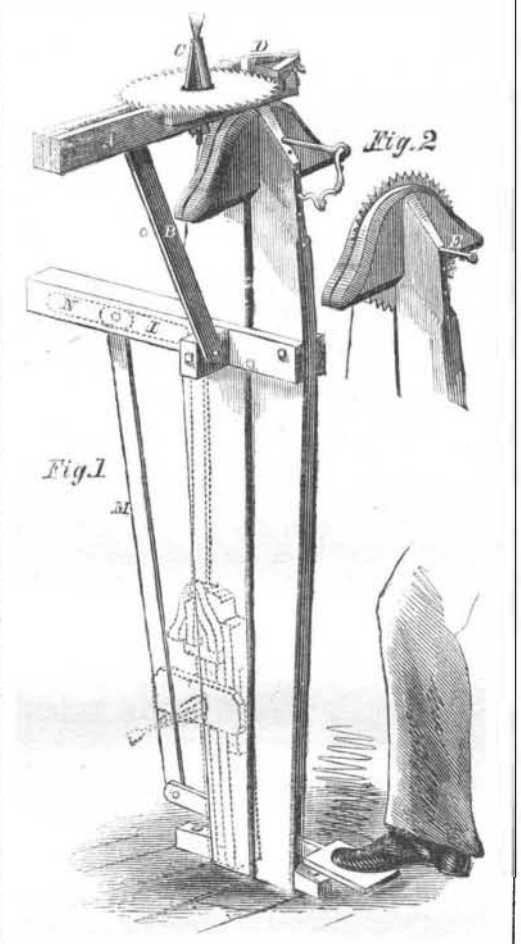
Many farmers are deterred from attempting to produce very early vegetables, by an erroneous idea that the making of a hot-bed is a complicated and difficult operation while it is just as simple as making a hill of corn. Every man who has a garden of whatever size, if he will once try the experiment of making a hot-bed, will, we venture to predict, find the task so easy and the result so satisfactory, that he will never forego the luxury afterwards. All that is necessary is to make a pile of horse manure 2½ feet deep, with the top level or sloping a little to the South, then set a rough frame made of four boards nailed together at the corners upon the bed of manure, fill the frame with 6 inches of garden soil and cover with a window of glass. Any old window will answer the purpose, but it is better to have the bars of the sash run only one way, and to have the glass laid in the manner of shingles.

The best plants to force are tomatoes and cabbages which may be transplanted from the hot-bed to the open ground without any trouble. We have removed tomatoes when they were in blossom, and had them all live. If melons or cucumbers are forced, they should be planted in flower-pots, and in transplanting them you turn the pot over upon your open hand and give it a gentle thump, when the earth comes out in a solid lump and the roots are not disturbed in the least. While the plants are growing, they should be watered frequently, and in warm days the sash should be raised a few inches to give the plants air. We have found the growing of plants under glass, from a small hot-bed, 4 feet by 6, up to a large grapery for raising the black Hamburg and Frontignac grapes, the most satisfactory of all horticultural operations. Having the control of the climate both in heat and moisture, the plants can be made to grow with a vigor which they rarely if ever exhibit in the open air. A hot-bed should be made from four to six weeks before the time for planting corn.

COMBINED VICE AND SAW SET.

The accompanying engravings represent an implement which, from its convenience, is being introduced into the shops for working wood, and is well worthy the attention of those who have saws to file and set.

Fig. 1 represents the setting apparatus arranged for use, and Fig. 2 the vice jaws for holding circular saws to be filled. In the former, the horizontal bar, A, is supported at one end by the brace, B, and at the other by a vertical iron plate, which is fastened rigidly to the bar and grasped by the jaws of the vice. This apparatus is for setting circular saws, the cone, *e*, holding the saw in place by passing through the hole in the center, and being readily adjustable to different sized holes by being raised or lowered by means of the screws at its top and bottom. For saws of different sizes, this cone is placed at the proper point in the slot in the bar, B, to bring the tooth



of the saw exactly over the angle in the anvil. For setting straight saws the ends of the teeth are placed against the brass guides, *d d*, which open at a greater or less angle, and thus permit the tooth to project a greater or less distance past the angle in the anvil.

Fig. 2 shows the manner of holding circular saws to be filed. For this purpose the setting apparatus is removed from the vice (hanging down by the side as shown by the dotted lines), and the saw is grasped between the jaws as shown; the pin, *e*, passing through the arbor hole, several holes being made in the vice to receive the pin with saws of different sizes. The jaws slide into the levers of the vice in dovetail grooves, and for use in filing straight saws the position of the jaws is reversed with their straight edges upward.

The levers of the vice are pressed together by a toggle joint remarkably adapted to this purpose. The two levers, *i* and *n*, connected by a joint in the middle, are acted upon by the treadle through the rod, *m*. When this rod is pressed upward, the toggle forces the jaws together and, being carried a very little past the straight line, holds the jaws in place, the moving lever of the vice being made of wood and somewhat elastic. The jaws are opened by pressing the treadle upward with the top of the foot. Thus the saws are inserted or removed in the shortest possible time, and the implement is exceedingly convenient in use.

A working model is now on exhibition at the Inventor's Exchange of S. A. Heath & Co., No. 37 Park-row, this city. The patent was granted, through the Scientific American Agency, Dec. 27, 1859, and persons desiring further information in relation to the matter, will please address the inventor, Norman Allen, at Unionville, Conn.

DISCOVERIES AND INVENTIONS ABROAD.

Copper Tubes made by Galvanic Process.—Our Parisian cotemporary, *Le Génie Industriel*, publishes the details of a process for making copper tubes without soldering, which consists simply in depositing copper upon lead patterns by the galvanic battery, and then melting out the lead. It is said to work perfectly, and, of course, tubes could be made of any desired form—straight, curved or right-angled. This suggests the idea of forming tubes in the same manner with cores of wax or clay. The clay may be forced into the size of the pipe through a draw plate, then allowed to harden slightly, when it may be covered with plumbago and an electro deposit of copper made upon it with a galvanic battery. When the copper is deposited in sufficient thickness the clay may be removed from the interior by boiling the pipe in water. To conduct this manufacture it would require long depositing troughs, and the expense would probably be too great for making straight copper tubes; but for curved tubes, such as the worms of stills, it would perhaps pay. Curved copper tubes are commonly made by filling straight tubes with hot resin, then twisting the entire tube into its curved form. When the resin becomes cool it is driven out by striking the pipe, which breaks the resin core into small pieces.

Waterproof Varnishes.—Take one pound of flowers of sulphur and one gallon of linseed oil, and boil them together until they are thoroughly combined. This forms a good varnish for waterproof textile fabrics. Another is made with 4 lbs. oxyd of lead, 2 lbs. of lampblack, 5 oz. of sulphur and 10 lbs. of india-rubber dissolved in turpentine. These substances, in such proportions, are boiled together until they are thoroughly combined. A patent has been secured for the application of such varnishes to waterproof fabrics, by N. S. Dodge, of London. Coloring matters may be mixed with them. Twilled cotton may be rendered waterproof by the application of the oil sulphur varnish. It should be applied at two or three different times, and dried after each operation.

Restoring Old India-rubber.—Mr. Dodge has also obtained a patent for restoring old india-rubber to a condition fit for re-manufacture by the application of dry heat. He reduces the material by machinery, in the first place, to a powdery state; then he subjects this, in a suitable oven, to about 300° Fah., and continues the heat until the mass assumes the plastic condition. Superheated steam has been found most convenient to use for the purpose of heating; and by using a double cylinder, with the steam in the outside one and the india-rubber placed inside, the best results have been secured. As gases arise from the india-rubber while it is being heated, these must be permitted to escape by a tube. Superheated steam may also be applied direct to the ground india-rubber. When reduced to a proper plastic state, it is fit for being used to manufacture various articles. It may be combined with 3 lbs. of white lead, 5 oz. of sulphur, 4 lbs. of oxyd of zinc, and half a pound of carbonate of magnesia or lime (chalk) to 10 lbs. of the plastic india-rubber. These are thoroughly kneaded together, and molded or struck by dies into the form of the articles desired, then submitted to the heat of 230° Fah. in an oven to produce the vulcanizing effect.

Gas Regulators.—It has thus far baffled all efforts to obtain a gas regulator that will prevent the jet of light from flickering. Hundreds of devices, we believe, have been tried to secure such a result, and yet our gas lights all flicker in the old-fashioned manner. A new gas regulator has been patented by Samuel Wright, of Sudbury, England (a gas engineer), by which the pressure is governed by passing the gas through a woven texture of linen, cotton, silk or hair into a chamber or chambers to which the burner is attached, the pressure of the gas at the jet of the burner being thereby governed as required. These woven fabrics are stretched in a small chamber (to which the gas is admitted in its passage to the burner) in the form of a diaphragm, through which it must pass before escaping. Instead of one diaphragm of woven fabric, one or two may be interposited, as required. The gas thus constrained to pass through the meshes of the material is diffused and equalized in its pressure, causing, it is stated, the flame to burn steadily and without flickering, thereby effecting a great saving of gas and producing a better light than can be obtained without such governing or regulating, which it effects in a much higher degree than can be secured by other regulators. The regulating diaphragm can be readily cleaned by washing, or a new material may be introduced when required.