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NEW YORK, FEBRUARY 1, 1851.

History and Description of the U. S. Patent Office Buildings.

DESIGNED BY WM. P. ELLIOT, ARCHITECT AND ENGINEER, OF WASHINGTON, D. C., AND ADOPTED BY THE XXIVth CONGRESS OF THE U. S., AT THEIR 1ST SESSION, AND APPROVED BY PRESIDENT JACKSON.

This magnificent building was commenced in the year 1836, and 270 feet of the south side of the block finished and occupied within four years from that period.

The annexed engravings, (figures 1, 2, 3), show the principal, basement, and gallery floors. The vignette at the head of all Letters Patent of the United States, represent a perspective view of the south front.

The explanatory references accompanying the plans show the uses to which the halls, galleries, and rooms are to be appropriated. The plans marked 1, 2, 3 show a quadrangular building 413x280 feet, with an open court for light, air, &c., of 270x112 feet, containing a large room for patented models 270x65 feet, and two smaller rooms for the same purpose, each 85-65 feet, communicating with the larger room, and thus making a room of 400 feet by 65 on the principal floor, and 36 rooms for office purposes, and the same number of rooms on the basement floor for rejected models, operative models, the heavier classes of patented models, work-shops, laboratories, furnaces, engines, &c. &c.—and a continuous gallery of 1100x65 feet, designed as a National Gallery for the exhibition of specimens of American skill and ingenuity, as developed by the patented improvements exhibited on the principal story, and to meet the requirements of the 20th section of the Patent Law of 1836. Other parts of the plan are intended to meet the requirements of other sections of this law. The plan of the building and the new code of laws were made and approved at the same time, and the interior of the building was intended to conform to the requirements of this law, as near as possible. The sides of the business part of the building are divided by wide passages of 16 feet, running longitudinally through the centre of the same, with openings at either end for light and air,—by which arrangement, and the open court in the centre, and the surrounding streets, the rooms are well ventilated and lighted. The temperature of the apartments, in cold weather, will be kept at a uniform degree by furnaces in the basement story. The building throughout is fire-proof. The walls of the basement story are to be of brick faced with granite. The superstructure is also to be of brick faced with a beautiful variegated brown and drab colored free-stone, which will harmonize with the gravity of the order of architecture adopted, and the character of the Institution. All the ceilings and floors are to be composed of brick laid in hydraulic cement, and flagged and supported by groin arches. The arched ceiling of the "National Gallery," is supported by rows of square columns and pilasters let into the external walls. The roof to be made light and covered with copper. The building is two stories high, resting upon an elevated basement. The order of architecture adopted for the exterior is the Grecian Doric of the age of Pericles, when the fine arts in Greece, particularly architecture and sculpture, had reached the highest point of excellence. The details are modelled after the celebrated Parthenon, erected on the Acropolis at Athens, one of the finest specimens of Athenian architecture, and which is now in part standing—the marbles having indurated to such a degree, by an exposure of more than 2200 years to the atmosphere, as to resist the action of a chisel. The principal front, on F street, is graced with a portico of 16 columns, octastyle arrangement,—the columns, entablature, and pediment being of the size and proportion of the Parthenon, each column being 18 feet in circumference at the base. The tympanum and metopes are left blank. In the Parthenon these parts were enriched with very fine sculptures

in basso-relievo and alto relievo, of such extraordinary excellence that modern artists may well despair of equalling them.

The monotony of this extended front is still farther broken up, and the boldness of the outline increased by projections of thirteen feet next to the east and west sides. The whole building is surrounded with bold antæ or pilasters, let into the external walls, which produce nearly as rich an effect as the isolated frustum of cone columns, and are much stronger, and serve also as buttresses to resist the thrust of the arches. The entablature is con-

tinuous, and surrounded by a blocking course, which finishes the superstructure. The windows are arranged between the pilasters. The north front, on G street, is the same as the south front, on F street, except that the inner columns of the portico are omitted. The east front, on Seventh street, is graced with a portico of six columns, which tends to break up the monotony of this extended façade. The west front is relieved by a similar portico. This portico, owing to the position of the ground on the west, rests upon a vaulted terrace, from which it will be approached. The

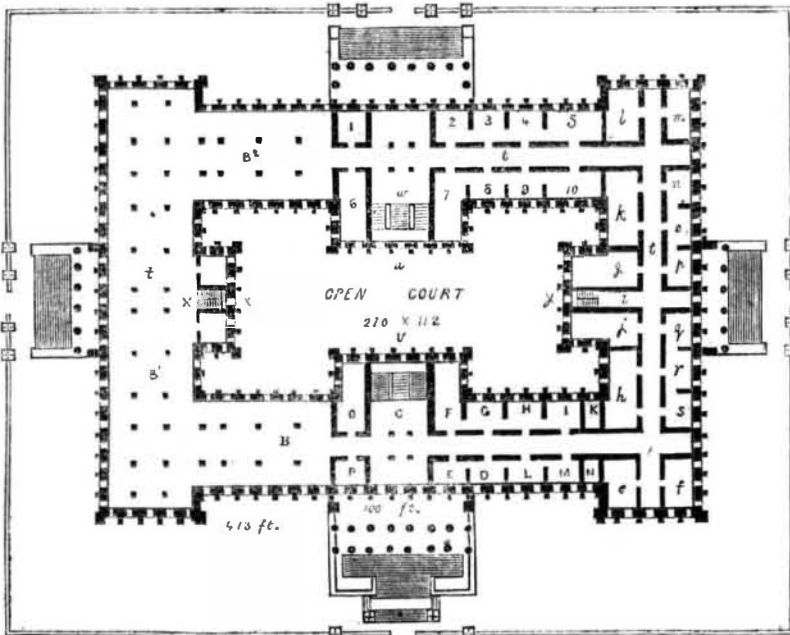
tent Office. The right side of the building is bounded by 7th street, west; on the left by 9th st., west. Figures 2 and 3 indicate the other bounding streets.

Explanatory references to the Original Plan of the Patent Office, adopted by Congress and approved by President Jackson in 1836.

Figure 1 is a plan of the principal story; fig. 2 is a plan of the basement story; fig. 3 is a plan of the Gallery story.

- A—National Gallery.
- B—Hall for pending and recently patented models.
- C—Vestibule.
- D—Commissioner's Room.
- E—Chief Clerk's Room.
- F—Draftsman's Room.
- G—Ante room now used as an Examiner's room.
- H—Copying Clerk and Letter Books—Library and Librarian.
- I—Examiner's room also occupied by the Assistant Examiner.
- K—Assistant Draftsman.
- L—Pay Clerk and Records and Record Clerk.
- M—Examiner and Assistant Examiner.
- N—Messenger.
- O—Caveat Models.
- P—Machinist.
- Q—Rejected Models.
- R—Ditto.
- S—Ditto.
- T—Vestibule of Basement.
- U—Workshop and Lathe.
- V—Laboratory and Experimenting Room.
- W—Seed Room.
- X—Assistant Messenger &c.
- Y—Room for Stove plates and large models.
- Z—Furnace.
- U²—Operative models.
- V²—Room for Wood.
- W²—Room for Lumber.
- X²—Operative models.
- Y²—Coal Room.
- Z²—Furnace.
- e—Room for Records and Clerks.
- f—Room for Drawings and Assist. Draftsmen.
- g—Stationery room and Assistant Messenger.
- h—Library and Librarian.
- i—Vestibule and Stairs.
- j—Room for Extension of the Library.
- k—Agricultural Statistics.
- l—Clerks of Ditto.
- m, n—Copying and Recording Clerks.
- o—Examiner.
- p—Assistant Examiner to Ditto.
- q—Examiner.
- r—Assistant Examiner to Ditto.
- s—Examiner.
- t—Continuous Passages extending round the Block.
- u—Open Court for light and Air 270x112 feet.
- v—Stairs of South side.
- w—Ditto of North.
- x—Ditto of West.
- y—Ditto of East.
- B'—Continuation of the model Room for Patented models.
- B²—Ditto.

Figure 1.

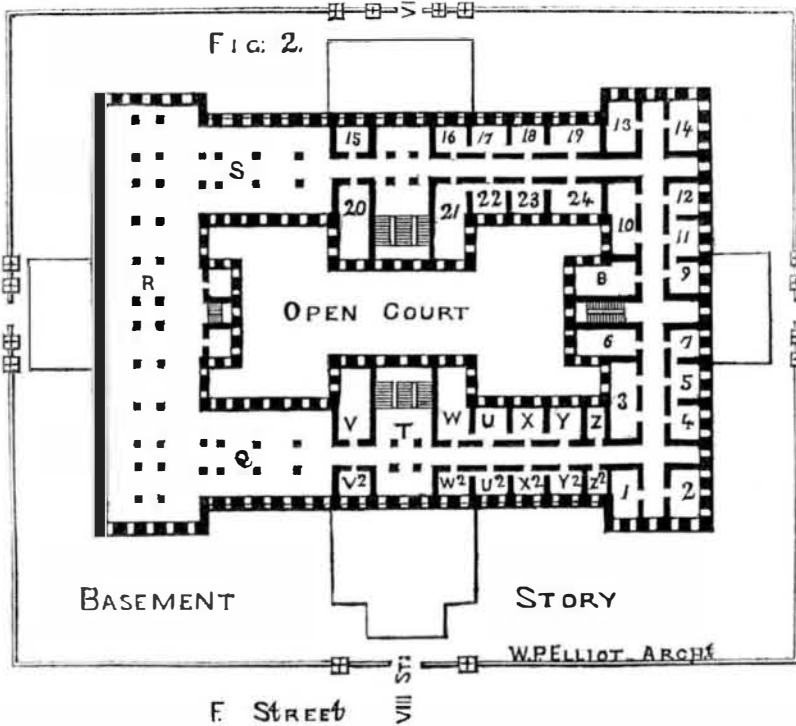


NOTES.

In erecting this building, as far as it has progressed, it is believed that the original design has been substantially adhered to, except in a few minor points; and in every case where the Superintendent took the liberty to deviate from the plan, the building has evidently been injured: for instance, in the substitution of the curved projection on the North side for the rectangular projection crowned by a triangular pediment; crossing the large arch of the National Gallery by architraves and friezes; cutting through the arches of the basement story to add two additional rows of columns; and changing the style of vaulting from the groin arch to the barrel arch system;

vaults of the terrace are to be used for fuel, lumber, &c. The cellar story, under this side of the block, owing to the low grade of Ninth street, has a greater height, and may be divided into rooms, to be appropriated to some useful purpose, as they will be well ventilated and lighted, and approached from the pavement on Ninth street. The horizontal terrace, or pavement, surrounding the whole block, will, on the curb line, be the same size as the appropriation or site on which the building is erected, viz., 500x363 feet, and be surrounded by a handsome ornamented iron railing, with gates, as shown in the figures, to be kept locked at night. The posts may support the lamps for lighting the place.

G. STREET NORTH.



cutting the floor of the National Gallery on the East side by stairs and chimneys; changing the material so as to make the subordinate parts superior in finish to the principal, and dropping the sills of the basement windows of the east wing below the level of the sills of the centre or main building producing a want of uniformity and consequently destroying the eurythmy of the façade—and also making the

windows of the basement too prominent in the composition. The reduction in the width and depth of the pilasters has also tended to take away from the building a portion of its boldness and strength. Had the Architect, who designed the building, been permitted to carry out his own design these alterations would not have been made.

Figure 1 is the principal story of the Pa-

As the number of applications for patents is increasing annually to an extraordinary degree, numbering 2,193 for the year 1850, and only three in the year 1790, and promising to reach 2,500 the present year, and in most cases accompanied by models averaging at least one cube foot in size, and there being at present upwards of 17,200 models in the office, and a large portion of which are unclassified for want of room and the business of the Department increasing in a ratio almost equal

to that of the number of applications, rendering it necessary to provide more room not only for the rapid accumulation of models but also for additional examiners, clerks, draughtsmen, machinists, and other officers required to carry on the increased business of the Department, and as the building, large as it appears to be, (413x280 feet) will be filled in less than twenty years, it seems to be a great misfortune that the architect did not select a larger lot of ground for the site of the Patent Office, to admit of the construction of a larger building—one that would have sufficed for the wants of the Department for a century at least.

It is true the collection of articles in the "National Gallery" might be removed to another building, and thus more room be provided for models and the open court of 270x112 feet could be covered with a glass roof in the manner of the Exchange Building in Paris, which would furnish upwards of 20,000 additional square feet, of which a large portion might be appropriated to the display of models and other articles, yet it is evident that in less than fifty years the whole block, open court, and other parts of the area will be crowded.

To add another story to the building would be inadmissible in this order of architecture, as the blocking course of the entablature finishes the building.

The basement story of the south side cannot be used for models owing to its damp state, arising from the omission of the builder to construct the cellar story in this portion of the structure. Already, the models at present crowded into the basement rooms are becoming very much corroded by dampness, and unless removed to drier apartments will be totally ruined.

Several of the clerks have suffered greatly from rheumatism, and other diseases, caused by being obliged to perform their daily labor in these damp apartments, and the Records, Books, drawings, and original papers are daily injured and liable to be lost in their transit to and from the principal floor to the basement story.

And the same may be said of the models. Much time is also lost by not having the current business of the office performed upon the same floor.

The rooms in the basement were never intended for the performance of clerical duties: they were mostly intended for fuel, furnaces &c., and to keep the principal story dry and comfortable.

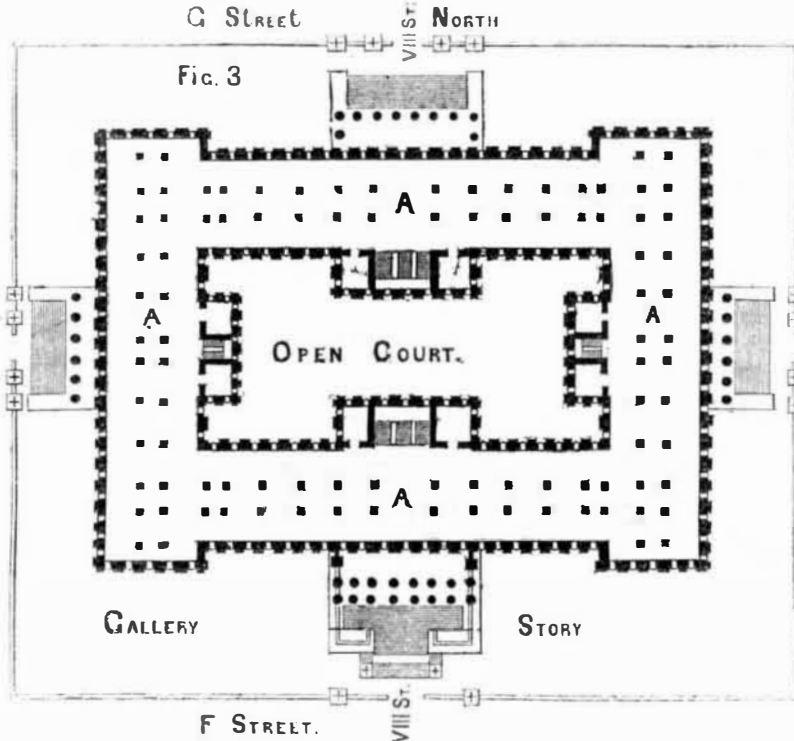
Although more room is required to conduct the business of the Patent Office, and although the structure was originated and built expressly for conducting the Department of Patents, it has been diverted, in a measure, from its original purpose; and deliberate attempts are now being made to consummate the greatest outrage ever perpetrated against the interests and feelings of the inventive community of our country, and that is not small now, both in influence and numbers. Let us go over the history of this affair.

In the Report for the year 1844, Mr. Ellsworth says, "The increase of models renders daily the transaction of business more difficult. The models of the patented inventions are crowded so much as to prevent classification; while models of rejected applications, equally important for exhibition, to enable supposed inventors to settle doubts as to originality, are not exhibited at all. It has been hoped that the large upper hall, designed originally for models, would not be diverted to other objects without some substitute being furnished. The beautiful collection of curiosities, however, from various parts of the world, forming the "National Gallery," are too important and interesting to be crowded out. There seems to be no alternative but to extend the building: this can be done at a moderate expense, if the work is performed by contract, under careful supervision. No new plan need now be presented. The original design contemplated two additional wings, one of which, added on the west side, would give sufficient accommodation by furnishing continuous rooms for models and the gallery."

Messrs. Ellsworth and Burke, the former

Commissioners, finding that they could not conveniently carry on the business of the office, as it should be carried on, without more office room, and more space in which to arrange and classify the piles of accumulated models, both patented and unpatented, applied to Congress, in 1844, 1845, 1846, and 1847 for an appropriation to complete the east and west wings of the building, according to the original plan. In 1849, Congress commenced by appropriating \$50,000 out of the Patent Fund toward erecting the east and west wings of the Patent Office, according to the original plan. In 1850 a farther appropriation of \$90,000 same was made from the same fund and for the

object. In the meantime the business of the office continued to increase at the rate of from 2,000 to 3,000 models per annum, averaging nearly one foot square. The models are now heaped up in confused masses, reaching nearly to the ceilings. After the wings had been commenced and carried up to a considerable height, the present Commissioner of Patents, to the surprise of everybody knowing anything about the subject, and in direct opposition to the fact, stated in his Report to Congress that "these additional structures are not required for the proper business of the office." The Chairman of the Committee on Finance accordingly moved to strike out from the appro-



priation bill the \$90,000, towards "the erection of the wings of the Patent Office building, according to the original plan," and his motion would have been carried, and the work stopped and left as a disgraceful ruin, had not a majority of the Senators understood the true state of the Patent Office better than its official head, and treated his recommendation as it deserved to be treated. Now, the present Secretary of the Interior, Mr. Stuart, taking advantage of the incorrect statements of the Commissioner of Patents, in relation to the actual wants of his Bureau, and his willingness to abandon the rights and interests of inventors, and the proper care of their valuable property, coolly and deliberately recommends to Congress, in his Report of the 2nd ult., published in the National Intelligencer of the 3rd ult., "that the two wings of the Patent Office be finished, and that they be appropriated to the accommodation of the Department of the Interior, and the different officers attached thereto."

It is but justice to Mr. Ewbank to say, however, that although he thought the wings of the Patent Office not required when the National Gallery would be removed to the Smithsonian Institute, he called upon Congress to refund the money which had been taken out of the Patent Fund for their erection. We believe that the wings of the Patent Office should belong to the Patent Office, and no other Department, for if they be absorbed by any other Department now, when they are required for Patent purposes, it will be no easy matter to get them—and required they must be at no very distant day. If the wings of the Patent Office be appropriated to the business of the new Department, it would be little better than highway robbery of the Patent Fund, to the amount of \$140,000, which has been applied towards their erection. Unless this is paid up, if the recommendation of the Secretary of the Interior is carried out, no man will look upon the transaction in any other light than as one of Gothic pillage. We want justice—no more and no less—done to the inventors, whose moneys have been so liberally lavished on building the Patent Office. The recommendation of the Secretary of the Interior to apply the wings of the Patent Office or

the benefit of the Department of which he is the head, is the coolest, most provoking and presumptuous recommendation that has come under our notice for a long time. Within the past year the greatest amount of Vandalism has been practiced against the Patent Office, by cutting and carving it all for the benefit of this new Department of the Interior. Orders have been given to subdivide the continuous "National Gallery" into small office rooms, and to add an attic story, for the Department of the Interior, thus entirely destroying the original plan of the building, and breaking up the Gallery, which has always been considered the most beautiful feature of the structure. The Patent Office was never designed nor intended to be devoted to any other purposes than those connected with patents. Mr. Goddard Chief Clerk of the Department of the Interior, in a letter to the Commissioner of Patents, dated 3rd inst., in order to answer certain questions of the Commissioner of Public Buildings, requested a statement of the number of rooms now occupied by the Patent Office, and whether any more, and what number, were needed. Mr. Lawrence, Chief Clerk of the Patent Office, on the 7th inst., four days after the other, makes the following answer, which we publish entire, and it will be found very interesting, as being a brief report of the state of the Patent Office:—

"PATENT OFFICE, Jan. 7, 1851.

SIR—In answer to your note of the 3d inst., directed to the Commissioner of Patents, and by him referred to me for reply, I have to state that there are twelve business rooms occupied by the regular force of the office on the main floor, and two small rooms at the end of the west passage, containing rejected models. In the basement story there are ten rooms, four of which are occupied by the temporary clerks, three used for storing the models of pending applications, two for coal rooms, and one used by members of the National Institute. The entire west passage on the basement is used for storing rejected models. This passage, though large, is entirely inadequate for the classification and proper disposition of the models already deposited there, and is at best but poorly adapted to the purposes of a model

room. The second room is now filled with the files and records of the office, and an additional room for them is indispensable. The same may be said of the Librarian and Draughtsman's room. The "Gallery," now occupied by the Smithsonian Institution for the exhibition of the collection of the United States Exploring Expedition, will probably be retained for that purpose; should this be the case, the entire upper story of the east wing would not be too much room for the arrangement of models. The business of the office is steadily on the increase, and although the number of applications in 1849 far exceeded any previous year, still the past year has exceeded 1849, in the number of applications, by nearly three hundred. The number of applications in 1850 will not vary far from twenty-two hundred, and the number of models received on those applications may safely be estimated at one thousand. You will thus perceive the necessity of providing not only for the present but prospective wants of the office, in that particular. Should the examining force of the office be increased (and the increase of business seems already to demand it) additional rooms for Examiners will necessarily be required. In case such an increase should consist of two principal and two assistant Examiners, two more rooms will be indispensable for their accommodation. If four assistant Examiners should be added, four rooms will be required, as such additional assistants would not occupy the rooms now used by the Examiners and their present assistants. In case the latter plan for the additional force should be adopted, the room now occupied by the Examiner and assistant would be occupied by the two assistants, and the principal Examiners would take separate rooms. The comparison of copies with originals is now done in the same room where the recording and copying is going on, causing much interruption and many errors. The clerk charged with this duty should therefore be provided with a room where it can be done without interfering with the proper execution of the recording and copying. In my opinion, at least six more rooms are indispensable for the transaction of business, besides the use of the Gallery of the east wing for the deposit of models. Respectfully,

DEWITT C. LAWRENCE, Chief Clerk.

D. C. GODDARD, Chief Clerk Dept.

[Query—Why did not the Commissioner himself answer the letter?

Those who know about the business of the Patent Office, state, that no less than thirty rooms are at present required by the office, and from the cautious manner in which Mr. Lawrence expresses himself, we would infer that his inner conviction was for thirty new rooms instead of six. At the present moment the models are arranged and kept in a shameful manner. What signifies the sending of models to our Patent Office, as representations of American genius, when they are stowed away in dark places, and treated so scandalously. There is a want of room and facilities for classifying and arranging the rapidly increasing number of models. Mr. Stoughton, the machinist of the Patent Office, in his last report, stated that "the policy of Congress in the law passed relating to the Patent Office, indicated a desire that every possible advantage should be given to inventors to examine every thing for which patents have been asked, so that they may not waste their thought, time, and means upon that which had been produced before. These facilities cannot be granted, as the building is now occupied, for want of proper room to arrange the models. The models now in the Patent Office have cost the inventors, at a moderate calculation, \$500,000 (half a million)." This is what Mr. Stoughton said in 1850, and lo and behold! the Department of the Interior has been plundering, and designs to plunder more largely, the room required for the patent business. We have said once before, that "the Patent Office was the biggest pirate of inventions in our country," as it had been often conducted, and now we say, "the Department of the Interior is the greatest pirate of inventors' property in our country." The Patent Office building never was intended to accommodate any other Department. To-

wards its erection \$248,000 (nearly half a million) have been paid out of the Patent Fund—the money paid in by inventors, and did not cost the rest of our citizens a single cent. Is it not a high-handed recklessness, then, to moral principles, in using and abusing the Patent Office, for any other purposes than those for which it was originally designed?



Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING JANUARY 22, 1851.

To A. W. Thompson, of Philadelphia, Pa., for improved Propeller.

I claim a propeller constructed as herein described, in such a manner that any one of its blades, in any line, drawn either parallel or perpendicular to its entering edge, shall have the curvature of a parabola produced, as herein set forth.

To Jacob Scheitlin, of Louisville, Ky., for improvement in Brick Presses.

I claim, first, in combination with the clay ducts and connecting carriage of moulds, the rods with their knives, (for the purpose of cutting off and foregin in to the moulds the regular quantity of clay,) and sliding plate or gate, for the purpose of opening and closing the communication between the clay ducts and moulds, as herein described.

Second, I claim the arrangement of the pins, connecting rod, and standard, with its arm, for the purpose of removing the brick after it is raised from the moulds, when the same are operated by means of the cranks, as herein described and shown.

To G. Thatcher, of Albany, N. Y., for improvement in Stoves.

I do not claim the device of sliding doors between parallel jambs or plates, for the purpose of concealing the same; but I claim providing sliding doors with flanges on their vertical edges, the rear flanges serving the purpose of hinges in opening and closing the same; and also serving to form air-tight joints when the doors are closed. And the front flanges serving in connection with the projecting ends of side plates, to relieve the appearance of a joint, when the doors are opened, as before described.

I also claim the providing of the side plates with projecting front plates, for the purpose of forming fronts to the spaces into which the doors are slid when open, to conceal the same, and in connection with the rear flanges, to form the hinges of the doors, when closing the same; and also to conceal a portion of the front flanges when the doors are opened and slid back, as described.

To E. T. Parker, of Berkeley, Ala., for improvement in Convertible Plow Stock.

I claim constructing a sub-soil plow with removable mould board and cutter, in combination with the tri-pronged cultivating teeth, that the same stock may be used either for a sub-soil plow, or for common plowing and cultivating land, as herein set forth.

To Charles Starr, of New York, N. Y., for improvement in tools for Embossing the backs of Books.

I claim forming circular embossing gilding or lettering tools of any required pattern, for embossing, gilding, and lettering book covers, by having a case or hollow metal cylinder fitting on a roller, and having an opening or openings in it, of any required form, for a panel or other border, the part of the periphery of the roller within the opening or openings in the case, having any required number of small tools, of any suitable form or pattern, secured

to it, the surfaces of the said tools standing even with the outer face of the case or cylinder, or by the employment of any number of tools, consisting of parts of a hollow cylinder secured to a solid cylinder, substantially in the manner described.

To A. A. Wilder, of Detroit, Michigan, for improved Lee-way Indicator.

I claim hanging the vane loose at the bottom of the rod, which carries or communicates with the pointet, and holding it either in position for operation, or secure within the vessel above the bottom of the keel, by means of a spring or its equivalent, operating substantially as herein shown and for the purposes set forth.

[The above invention was illustrated and described in No. 8, present volume of the Sci. Am.]

To Daniel Wilson, Jr., (assignor to D. Wilson, Jr., & H. M. Bird,) of North Chelmsford, Mass., for Horse Shoe Nail Machine.

I claim the simple combination of the punch, the slotted bed-die the heading die, the header slide, discharging orifice and header, as arranged, constructed, and made to operate together, substantially as specified, or, in other words, their arrangement and construction essentially as explained, whereby they are made to separate the nail blank from the rolled plate to move it downwards upon the header slide, to cause the header slide to advance, in the meantime, to hold the nail blank, by means of the punch and header slide, to cause the header slide to slide underneath the nail while it is so held, to carry the header against the nail and head it, to cause the header slide to retract or move backwards far enough to carry or move the discharging orifice directly under the nail, and so that the nail may be forced down into or through such orifice, by the further depression of the punch which next takes place, and finally to elevate the said punch to the first or highest position.

DESIGNS.

To J. G. Lamb, of Cincinnati, Ohio, for Design for Stoves.

To S. W. Gibbs, of Albany, N. Y., (assignor to North, Harrison, & Co., of Philadelphia, Pa.) for Design for Stoves.

To S. W. Gibbs, (assignor to Ira Jagger, Wm. B. B. Treadwell, & J. S. Perry,) of Albany, N. Y., for Design for Cooking Stoves.

Shanghai and the Chinese.

The Chinese excel in the compactness of their cooking apparatus, which consists of an earthenware stove, about the size of a flower pot, in which they burn charcoal, and fan it very quickly into a red heat; by covering this over with an iron thing, something like a dish cover, they bake pastry very nicely.

About Shanghai the country is very flat, and ages ago it must have been covered with water. It appears to be going to decay for all the bridges and the joss houses, and the statues in them, are going to ruin. From the general character of the Chinese just now, they appear not to have two ideas, yet their buildings, tombs, and statues show them to have been a fine race, some time or other. It is pitiable to see their fine bridges and buildings going to ruin. The land is divided into large fields of 40 or 50 acres by ditches, which are navigable for their small boats when the tide is in, and are used for irrigating the lands. These fields are sub-divided by narrow paths, and almost every family has a small quantity of land, on which they grow wheat, cotton, and rice; and the surplus of any of these, after they have taken what they require for their own use, is sold, and fire-wood generally bought with it. Fish is very abundant, and the ditches attached to their property in a great measure supply them. The men do the heavy work in the fields, but the women and girls assist at harvest time, and in packing cotton.

They thrash with a flail, which is an improvement on ours. It has two fashes, which are connected by strings; they also have good winnowing machines. * * * They have a very nice gin for cleansing the seed of cotton, but not equal to the American ones. They spin and weave by hand. The cloth they make is very good and strong, but only about fourteen inches wide. Nearly all the native

cloth is dyed blue; indeed that is the only color used except drab, and white for mourning. They grow their own indigo. The cotton seeds, after cleaning the cotton, they feed sheep and goats with, and also grind or crush it, to extract oil from it, and feed the cattle with the remainder. They grind the wheat with millstones, which are turned by a pony or Buffalo, and make very fine flour.

For the Scientific American. Mechanical Principles.—No. 5.

I do not intend to occupy any more space in the columns of the Scientific American with this subject, than a few brief remarks in the present number. As a subject somewhat abstract, it is not of much interest to the great majority. My object was to present, clearly, in as few words as possible, the outlines of the science; and I will now conclude with a few words of advice to those who are in search of new things.

Before any man assumes to have discovered something new, he should inquire,—“do I know all that is already known on this subject?” We hear of this and that alleged new discovery, and many such are made, but it is also true that a great many of them are not improvements nor discoveries. Some men, with a hardihood of no common kind, leap out with a discovery which, in their estimation, proves all the old philosophers to have been men of little capacity, and of less correct knowledge. This has been the case in two instances in the Scientific American. One, who professed to have discovered a new principle in mechanical philosophy, about *inertia*, and the best form of sailing vessels; and the other a totally different principle in *inertia*, namely “gravity,” and it was in answer to him that I commenced these articles. By a careful consideration of the works of Newton and Euler, it will be found that no new light has been elicited in Mechanical Philosophy.

In the construction of any machine, no man can make it give out more power than it receives:—the steam is the power of an engine, the water is that of a water wheel. That machine is most perfect which transmits the greatest amount of the real power, whether it be of water or steam. The rendering more simple the various parts of a machine, so as to decrease friction, &c., is a subject which should engage the attention of every mechanic, because the field for improvement, in this respect, is very extended—to save power, in all machines, is a grand desideratum. There are but few who have applied any philosophic improvement, like the “governor” to machinery—such inventions are rare.

Various as are the modifications of machines, there are only three objects to which their utility tends:—First, furnishing the means of giving to the moving force, a good direction. Second, accommodating the velocity of the work to be performed in the most proper and economical manner. Third, guiding the motive power to produce the greatest effect, so as not to throw any of it away. Now, to attain this knowledge, no mere theory will suffice; experience alone is the teacher, but this experience must be linked with a good judgment, and a knowledge of mechanical principles, or else no improvement can be expected.

MACLAURIN.

Fast Sailing Ships.

The British are beginning to awake to the importance of fast sailing ships, to compete with America. It is well known that American ships have taken the trade out of the hands of English houses and that all the fine packet ships running between New York and Liverpool are built in America. The Liverpool Albion states that clipper built ships are beginning to be built and to supersede all others there.

It states that in the year 1822 some spirited Scotchman located in Liverpool built in the town several vessels for the Charleston trade, called the Lalla Rookh, Marmion, &c., which were superior in sailing qualities to any other then existing. They did not meet with encouragement, were afterwards sent out to Brazil, and were subsequently wrecked.—Their performances kept alive, however, some spirit of enterprise in merchants connected

with the Brazils, but it was not until the year 1839 that the Columbus began her career of navigation between this port and Pernambuco. She was built in London for a paddle-wheel steamer, under the superintendence of Captain Daniel Green, and was intended to test the experiment of working steam with quicksilver, instead of by the ordinary method. That experiment did not answer; she was converted into a sailing ship; and her performance induced the owners to build a kind of sister ship, called the Sword-fish commanded by a brother of Captain Green, between whom there has been a praiseworthy rivalry, and they have at times run each other very hard, each having made passages of about twenty-two days to and from Pernambuco. Beyond this little notice was taken of the matter, except later on the building here of the Seraphina and Empress, to compete with the above vessels.—Shipbuilders and merchants were wedded to old ideas, and content to jog on in the old-fashioned way.

To Aberdeen belongs the merit of carrying out a practical illustration of the advantages to be derived from building ships combining superior sailing qualities with great capacity for cargo, and it is hardly necessary to point to the Pilot-fish, the Bonita, the Reindeer, and Emperor, as reflecting infinite credit on the spirited parties who projected those vessels. The system is now being generally adopted, sharpened, as it must be, by free trade and competition with foreigners.

For the Scientific American. Belts and Pulleys.

In Vol. 6, page 53 of the Scientific American is an inquiry relative to the use of thick and thin belts; in the number succeeding you alluded to it without giving a definite answer,—and in No. 18, E. M. Chaffee attempts to answer the question, but fails in correctness. E. M. C's result, from his experiment, is correct, and would apply were the driver and driven pulleys of the same size, but when the sizes vary it is incorrect; for, supposing the one pulley was 48 inches diameter, and the other only 12, the difference in speed, with an extremely thin belt, would be precisely four times, because 12 is contained 4 times in 48; now if the belt is of sufficient thickness to increase the large pulley one inch in diameter, making it 49 inches, the same belt will increase the small one an inch, making it 13 inches, causing the small pulley to make only 3779 revolutions to one of the large pulley. The large and small pulley must be increased or diminished, relatively, to keep the speed equal. Experiment has taught that ropes, belts, &c., in coiling around cylinders or pulleys, stretch on the outer side, and contract on the inner—and the stretch being 2, and the contraction 1—consequently, the point that neither stretches nor contracts, is one-third the thickness from the inside, and two-thirds from the outside of the rope or belt. If in the above illustration we wish to know how thick the belt must be to increase the diameters one inch, we find that it is increased half an inch on each side, and as that point of the belt that keeps its length must be half an inch from the surface of the pulley, by the above rule we see that the contraction is one, and the stretch two, and that the belt must be 3 half inches, or one and a half inch thick.

The rule for calculating speed by belts, accurately, is always to add to the diameter of the pulleys and drums, two-thirds the thickness of the belt or rope to be used in making the calculations, but in making the pulleys they are to be $\frac{2}{3}$ thickness less in diameter.

H. W. BENNETT.

Rutland, Vt., Jan. 20, 1851.

English Patents to Americans.

Edward Dunn, of New York, now residing in London, for an improved engine for producing motive power by the expansion of alcoholic vapors. Patent dated Dec. 26, 1850.

John Ransom St. John, of New York, engineer, for improvements in the construction of compasses and apparatus for ascertaining and registering the velocity of ships through the water. Patent dated 27th Dec. 1850. This is a great invention. Mr. St. John is a resident of this city.