

EMERY GRINDING MACHINERY AT THE PARIS EXHIBITION.

**EMERY GRINDING MACHINERY.**

We take from *Engineering* the accompanying engravings of Handyside's pulley grinding machine, made by Messrs. Thomson, Sterne & Co., of Glasgow.

This machine is capable of grinding pulleys with either straight or curved rims, and all the belt pulleys of Messrs. Thomson, Sterne & Co.'s machines are finished by it. Referring to our engraving, it will be seen that the machine consists of a substantial frame on which are mounted two heads, the one carrying an emery wheel and the other a mandrel on which the pulley to be operated upon can be fixed. The first mentioned head can be shifted to and fro along its bed, so as to enable the emery wheel to be brought to bear upon pulleys of different sizes, and, as will be seen from our left hand view, the driving belt arrangements are such that the tension of the belt which gives motion to the emery wheel is not altered by the head being shifted on the bed.

The second frame or head which carries the pulley to be operated upon has more complicated movements. Thus in the first place the frame carrying the mandrel is adjustable toward or from the emery wheel, so as to bring the center line of the mandrel either directly over the center of the base, or at different distances from that center; secondly, the casting on which the mandrel frame immediately rests is capable of being moved to and fro at right angles to the plane in which the emery wheel revolves; and, thirdly, the base which carries this slide has cast on it a strong hollow vertical cylindrical center to which a reciprocating rotary motion can be communicated. Referring to the left hand view, it will be seen that the transverse movement of the pulley carrying frame is imparted by a connecting rod coupled to an adjustable crank pin in a disk crank at the upper end of a short vertical shaft, this shaft carrying a worm wheel into which a driving worm engages. By this arrangement the pulley to be ground can be slowly traversed to and fro across the emery wheel. At the lower end of the vertical shaft just mentioned is another disk crank with an adjustable pin which can be coupled by a suitable rod with an arm on the bottom of the vertical center with which, as we have already stated, the base of the pulley carrying frame is provided. By the use of this crank alone, or by its employment in conjunction with the other crank, combined with the power of adjustment afforded by the upper side of the pulley carrying frame, such a motion is given to the pulley as to impart to its rim any desired convexity.

The right hand view shows clearly the manner in which the pulley under treatment is mounted on its mandrel, and also the arrangement of the gear by which a slow revolving movement is imparted to the latter so as to bring all parts

of the pulley rim successively under the action of the emery wheel. The arrangement of the belt gear for maintaining a proper tension on the belt, while leaving the pulley carrying frame free to move, will be readily understood from an inspection of our engraving without special explanation. One of the great advantages of the machine is that it enables pulleys to be cast much lighter and more nearly to their finished size than would be possible if they had to be turned in a lathe, while when once set it is perfectly automatic in its action.

**NOTES OF PATENT OFFICE DECISIONS.****LABELS AND TRADE MARKS.**

Parker filed his application for the registration of a label, which he described as consisting of "the figure of a boy, and the words 'Scratch my back,' surrounded by a border of parallel lines, as shown, the figure and the words being formed of numerous squares, printed, and arranged as represented. This label is for use on cards, or sheets of abrasive paper or cloth, and as a pattern for sample work, to be wrought on the squares, in order to so finish the label when desirable. The cards thus labeled are intended for use in firing friction matches."

The question was, Was it a label, trade mark, or design, or should it be copyrighted? One definition given by Webster of a label is about what the Patent Office regards as being the proper matter to be registered as such: "A narrow strip of silk, paper, parchment, etc., affixed to anything, denoting its contents, ownership, and the like, as the label of a bottle or a package." So far as this definition includes fanciful and arbitrary matter, which may be used for the sole and independent purpose of a trade mark, to denote origin or ownership, it is not applicable to matters registered as labels.

Registrable labels or prints and trade marks are recognized by the terms of the law and the decisions of the courts as applicable only to some kind of merchandise; labels as giving the names of the manufacturers, place of manufacture, nature or quality of goods, directions for their use, and the like; and a trade mark as some arbitrary symbol to distinguish the same from those goods of a similar character made by other persons. The courts have always sustained trade marks and labels on precisely the same principles, and they uniformly discuss these matters as having been affixed, in some way, to goods, as merchandise, and not as constituting the merchandise itself. Thus in *Moorman vs. Hodge* (2 Sawyer, 78) the learned judge, in passing upon an alleged trade mark, stated that he had examined with care a large number of cases involving infringement of trade marks, including all the recent cases which he had been able to find bearing upon the question, and that he had found no case in

which the use of an article or package containing it had been enjoined, unless there was some symbol, word, letter, or form impressed or affixed to the article, and which, considered separately from the article or package, was used as the trade mark.

Now the matter which Parker sought to register was not a label, print, or a trade mark affixed to goods or merchandise, to denote ownership, or the character of the goods, and the like, but was the article itself—a fanciful pattern wrought, or to be wrought, into or upon the article—forming part of the article, and giving to it a certain value, by way of a new appearance, like a new pattern worked upon a slipper. It was not designed to be published as a work of fine art, and therefore was not the subject of copyright.

Summing up the case, therefore, so far as above discussed, it was apparent that the subject matter of Parker's application was not a label, print, or trade mark, or the subject of copyright.

The remaining question to consider was whether the design act applied to the case. The law relating to design provides for the granting of patents to those who, among other things, have invented and produced "any new and original impression, ornament, pattern, print, or picture to be printed, painted, cast, or otherwise placed on, or worked into, any article." The Supreme Court of the United States have held that the object of this act was to extend the protection of a patent to the ingenious producer of new and original appearances given to manufactured articles, whereby their salable value was enhanced, and the demand for them enlarged. This appearance may be the result of the peculiarity of configuration or of ornament alone, or of both conjointly.

The Commissioner therefore held that in view of the fact that the subject matter of Parker's application was ornamental in character, and was to be incorporated into the structure of the article, to be a permanent part thereof, it came within the terms and meaning of the design act.

In *Hall vs. Atkinson*, the testimony showed that about the year 1840 Alexander Calhoun and David Atkinson were a firm engaged in the manufacture of plows; that they devised a plow which met with great favor among the agricultural districts of the South, and this plow soon became known as the "Calhoun" plow. Some time before 1858 Atkinson died, and his widow took his place as a member of the firm. In 1858 Calhoun died, and his place was supplied by John Calhoun. This firm continued to supply the market with the plows in question until about the breaking out of the war in 1861, since which time Mrs. Atkinson had not been engaged either in the manufacture or sale of plows; but the firm of which she was a member leased the right to manufacture these plows, and to use the brand of "Calhoun &

Atkinson" (the designation stamped upon the plows, although the same were commonly known as the "Calhoun plow"), to H. B. & B., who were succeeded by the firms of B. B. & Co., W. W. B. & Co., and finally by C. & P. From the time of giving up their lease in 1867, H. B. & B., now the firm of James H. Hall & Co., one of the parties to the interference, continued, without any special lease or permission, the manufacture and sale of the "Calhoun plow," and branded their plows in that manner without any opposition from Mrs. Atkinson or her lessees. The evidence further showed that not only this firm but several other business firms in various places had manufactured, without any substantial opposition, plows known by the same name, namely, the "Calhoun" plow. The said Hall & Co. and also Mrs. Atkinson filed applications for the registration as a trade mark of the word "Calhoun" as applied to plows. The acting Commissioner in refusing the registration held that the evidence on both sides clearly showed that the name had ceased to denote origin or ownership of any particular person or firm, but was used extensively by firms to designate a particular plow of a peculiar shape, and known to the public as the "Calhoun" plow, and that hence, having lost its office of pointing out distinctively the origin or ownership of the article to which it was affixed, and having become a generic term in common use as such, it could not be re-adopted by the original owners thereof, or monopolized by any one firm or person.

#### Iron Direct.

From the *Bulletin du Musée de l'Industrie Belge* we find an article on the Blair direct process of making steel and iron as improved by Mr. Blair and perfected (?) by Mr. Ireland. The main features of the process were the feeding of the broken ore and coal into an upright cylinder and applying heat externally, and as the ore became reduced to metal—de-oxidized—it was discharged continuously into an iron prolongation of the cylinder which was surrounded by water to insure rapid cooling. The improvements consist mainly in mixing a small percentage of broken carbonate of lime with the ore and coal in the cylinder, and passing oxide of carbon through and over the charge, thereby gaining about 50 per cent in operating time, and in dividing the iron prolongation of each cylinder into several small ones for the sake of still quicker cooling, and thus lessening the chances of oxidation of the metallic sponge.

A Siemens, Ponsard, or other gas generator is used, and Mr. Ireland, it is said, has worked successfully when using as fuel a poor lignite containing a good deal of pyrites, and without contaminating the sponge, an experience which seems to contradict that of others who have worked in the same line.

Other economical modifications have been made, but the most prominent features—the fundamental principles of the process—are unchanged, and herein, we think, lies the mistake, for if our judgment of the causes of the many failures to attain the object sought by Messrs. Blair and Ireland is correct, the "direct process" can never be a practical mercantile success until by some plan the ore, coal, and reagents are powdered together, so that the reduction of the ore and its required carbonization may be equal and easily regulated throughout each particle, while further economies in time and fuel are effected.

#### Communications.

##### Correcting Leading Screws.

To the Editor of the Scientific American:

Noticing in your issue of June 15, 1878, page 373, a method of correcting a leading screw, I was reminded of a plan which I employed some years ago in a similar case. I wished to cut a number of new leading screws having a pitch of 6 threads to the inch. The lathe which I was to use had a leading screw of the same nominal pitch, but on measuring 3 feet of the same I found it too short by  $\frac{1}{8}$  of an inch in that length. To make the correction, I proposed to increase the speed of the screw sufficiently to compensate for its deficiency in length. Now  $\frac{1}{8}$  of an inch in 3 feet would equal  $\frac{1}{8} \times \frac{36}{12} = \frac{1}{8} \times 3 = \frac{3}{8}$  of the whole length; that is, each thread was too short by  $\frac{1}{8}$  of itself. Consequently if the leading screw should make  $1\frac{1}{8} = 1\frac{1}{8}$  turns to one turn of the screw to be cut, the proper correction would be made.

In order to realize this small ratio with wheels of convenient size I used two pairs of wheels arranged differentially, so that the first pair should gain while the second lost, the former preponderating sufficiently to make the desired correction. The sizes of the wheels were found as follows: Finding  $\sqrt{1\frac{1}{8}} = \frac{3}{2}$  nearly, I made two wheels of 34 teeth, one of 33, and one of 35. A 34 tooth wheel is put upon the lathe spindle or "stud," and the 35 tooth on the leading screw. A double "intermediate" is made by fastening the other 34 tooth and the 33 tooth together. Then the 34 on the spindle engages the 33 of the intermediate, and the 34 of the intermediate engages the 35 on the leading screw. The annexed diagram shows both the relative positions and number of teeth of the wheels:

34 lathe spindle or "stud."  
|  
33—34 intermediate.  
|  
35 leading screw.

It will readily be seen that the first pair of wheels gain in the ratio  $\frac{3}{2}$ , and the second pair lose in the ratio  $\frac{2}{3}$ .

The product or resultant of these two ratios is  $\frac{3}{2} \times \frac{2}{3} = 1\frac{1}{2}$ , which is practically identical with  $1\frac{1}{8}$ .

In the case of the Pratt & Whitney lathe mentioned by Mr. Rose, the error was  $\frac{1}{16}$  of an inch in 24 inches. Then  $\frac{1}{16} \times \frac{24}{12} = \frac{1}{2}$ , and  $\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{1}{1.414} \approx \frac{1}{1.41}$  nearly; so the two pairs of wheels would be  $\frac{1}{1.41} \times \frac{1}{1.41} = \frac{1}{2}$ , which agrees with the desired ratio,  $\frac{1}{2}$ , to six places of decimals.

As thus described, the device would be useful only for cutting screws of one pitch. To apply the same idea so as to use the ordinary change wheels for various threads, I would furnish the leading screw with a sleeve which slips over the blank end of the screw and rotates on the same. The outer end of the sleeve is fitted to receive the change wheels, while its inner end carries (in my case) a 34 tooth wheel. Close to this wheel, but fixed to the screw, is the 35 tooth. The double intermediate, 33-34, revolves on a stud fixed to the lathe bed. The annexed diagram shows the relative position and arrangement of the wheels and other parts:

—Lathe spindle or "stud."  
|  
change wheels.  
|  
Sleeve—34 35—screw.  
|  
33—34—intermediate.

This method seems to me simpler, both as to construction and calculation, than the one before published.

D. L. F. CHASE.

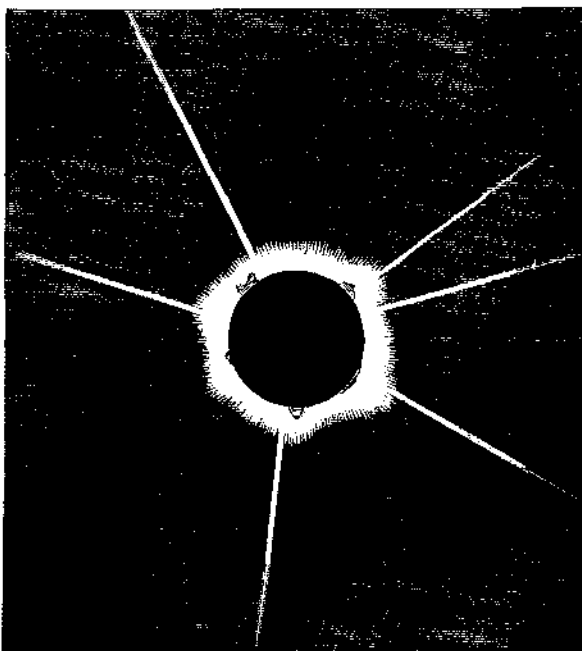
Boston, July, 1878.

#### Eclipse of the Sun.

To the Editor of the Scientific American:

As your paper is more in the hands of scientific people than any other, I beg to send the following for publication, trusting it may reach observers of the coming eclipse in good time to be of service.

One phenomenon connected with total eclipses of the sun often escapes notice from the fact that, in order to its detection, the eye must have been rendered very sensitive by previous confinement to entire darkness. I refer to the pencils of light shooting off into space through the crevices in the moon's profile. In 1869 there were but three in our party, under Professor Abbe, at Sioux Falls, Dakota, who observed these rays of delicate light.



The drawing I inclose is designed to show the general effect of these rays, not their exact positions, for I made no sketch on the spot. It is always well in eclipse observations to have one or more of the party shut up in total darkness for 15 minutes at least until the instant of the sun's disappearance. I trust some may feel sufficient interest in the appearance here named to give special attention to making drawings of these threadlike rays shooting off into space, like the supporting rays of a spider's web; or rather like silver threads hanging in the heavens the marvelous brooch of a moon of jet set in a corona of purest silver.

A caution given to the writer by Professor Alexander will always be useful to those who are for the first time to observe a total eclipse of the sun—not to let the grandeur of the scene as a spectacle draw their attention from a strict performance of their duties. All who have witnessed such an eclipse will appreciate both the temptation and the necessity for guarding against it.

W. CURTIS TAYLOR.

Philadelphia, July 16, 1878.

#### Microphone and Telephone.

To the Editor of the Scientific American:

Having put a microphone (one of Hughes' form) in circuit with telephone and battery, I found that when the microphone was submerged in a bucket of water, the ringing of a bell in the water, or the dropping of a nail on the microphone, could be heard clearly and distinctly in the telephone; rubbing on the sides of the bucket, or a slight

commotion in the water, near the microphone, could also be heard in the telephone.

During a thunder storm recently, on putting my ear to the telephone (using earth connection), I could hear a peculiar sound, somewhat similar to small sounds transmitted through the microphone every time a current of electricity passed from the clouds to the earth, and *vice versa*; so that the moment the lightning indicated to the eye the passage of the current, the telephone indicated the same to the ear. Breaking and closing the circuit by means of a key, could be heard in the telephone, as when a battery is used, although none was connected with it. On bringing the microphone in circuit, it worked as though a battery was connected with it, but, as previously mentioned, none was used.

The latter phenomena continued throughout the following day, which was partially cloudy.

WM. S. ALDRICH.

Burlington, N. J., July 9, 1878.

#### The Sutro Tunnel.

The telegraph reports that on the night of July 8th, at 11 o'clock, connection was made between the Sutro Tunnel and the 1,650 foot level of the Savage mine; that a strong draught of air at once poured into the mine, and, heralded by this welcome breeze, Mr. Sutro himself entered from the tunnel, and a general jollification ensued. The recent agreement between the Sutro Tunnel Company and several leading Comstock mining companies, though it does not, as we understand it, include the mines now producing ore, is a very important and auspicious arrangement for all parties. Nothing is more certain, if we may judge of the future by the past, than that every mine on the Comstock will sooner or later be obliged to pass through another period of non-production and costly and difficult exploration. At the present depth and temperature of operations the Sutro Tunnel will be a necessity to every mine in that condition, and in most cases the companies will have to make terms with Mr. Sutro or abandon their work. From this time he commands the situation. We congratulate him on the triumph, which is so largely due to his individual energy and perseverance. The only pity is that the great adit has been delayed and rendered more costly by discord among the parties who should have been most deeply interested in its success from the beginning. The mines should have controlled the tunnel. Now it looks a little as if the tunnel were destined to control the mines.

By the way, how would some of our friends among the Comstock superintendents like to peruse again the testimony they gave on this subject, a few years ago, before the Committee on Mines and Mining of the House of Representatives? Are we dreaming, or did we not hear, on high practical authority, that the Sutro Tunnel would never be completed; that it would do no good if completed; that it would not be needed for drainage, because there was so little water in depth; that it would not assist ventilation; that ventilation was good enough, anyhow; that it could never transport ores, etc., etc.?

It is a long road still, and we will not say an easy one, to the fulfillment of all Mr. Sutro's hopes. Whether ores will be taken through the tunnel, to be concentrated and reduced on the Carson, is a question involving many complicated interests, as well as technical difficulties. Of the latter, one of the most serious appears to be that if the tunnel proves greatly useful in ventilating the deep workings and reducing the temperature, it may not be thought advisable to impair its efficiency in this respect by choking it with trains of cars. It still remains to be determined in what way it can be made most useful, and how many functions it can successfully discharge at once. But there can be no doubt that, in one way or another, it will be the salvation of the deep workings on the Comstock lode.—*Engineering and Mining Journal*.

#### New Agricultural Inventions.

George Washington Grimes, of Bluffton, Indiana, has patented an improvement in the Combined Drill and Planter, for which letters patent No. 199,200 were granted to him January 15, 1878, which makes it more convenient, more effective, and better adapted for different kinds of planting.

Hazen R. Underhill, of Derry, New Hampshire, has patented an improved Double Mould Board Side Hill Plow, which is so constructed as to be available in any ordinary plowing. It is easily adjusted to turn the furrow in either direction.

Charles Daniel, of Virginia, Missouri, has patented an improved Plow Colter, that is adapted to reversible or hill side plows. It consists in a cutting wheel that is journaled in a swiveled support and attached to a sleeve on the plow beam, said sleeve being provided with a latch that engages a notched collar on the beam.

John A. Perry, of Carthage, Alabama, has patented an improved Churning Apparatus, which may be used with ordinary churns without any change whatever in said churns. It is effective in operation, bringing the butter quickly, developing all the butter there may be in the milk, and gathering the butter so that it can be readily removed.

An improved Field Roller has been patented by Thomas B. Rice, Jr., of Medora, Ill. The invention consists of a field roller made of one, two, or more independent sections, that turn by end gudgeons in slotted holes of the supporting frame, and in chain supported center links. Each roller section is connected by chains or belts with pulleys of the frame, so as to run lighter by the action of the chains.

Aaron Rosier, of Sussex, Wis., has patented an improved