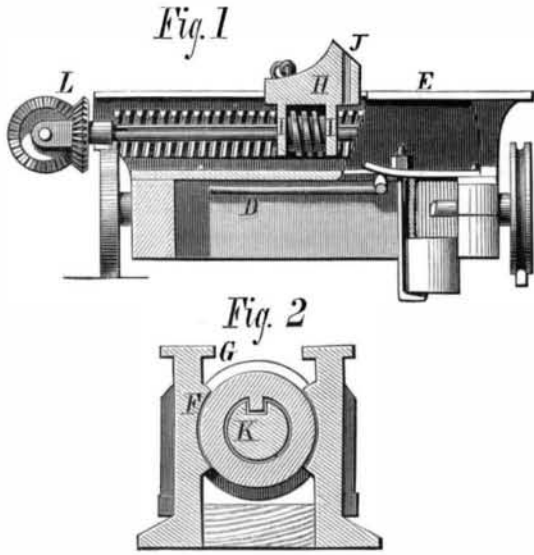


Mr. B. F. Melton, of Gainesville, Texas, has made certain improvements in the construction of Saddles, of the kind known as Spanish, so as to make them simpler, stronger, and lighter. The weight of the Spanish saddle, as it is usually made, is the principal objection to its use; and this is what the inventor seeks to correct.

Mr. J. W. Cooper, of Salem, Ind., has invented an Alcohol Lamp, for use in soldering and similar purposes. The reservoir is pivoted in a supporting frame, and is provided with two wick tubes of different sizes, which latter have independent extinguishing devices. By an ingenious contrivance the wick of the larger tube is automatically projected and lighted by the smaller flame, which is kept burning, whenever the reservoir is turned on its pivot.

IMPROVED SAW MILL HEAD BLOCK.

We illustrate herewith an improved head block of new construction for saw mills. It is strongly made, and possesses novel modes of adjustably fastening the carriage to the



rock rail, and of holding the log and driving the dog into it. Details of the mechanism are shown in Figs. 1 and 2, and a plan view is given in Fig. 3. A is the head frame, which, in common with the other rectangular frame, C, shown, is supported by track wheels secured to axles. It is attached to a bar, B, which has a rack upon its under side that is engaged by the usual driving pinion. The frame, C, is movable on bar, B, being notched to receive the same, and has a clamping bolt that hooks under the bar and is secured by a nut resting on a plate on the top of the frame. An eccentric lever, D, is provided, by moving which the plate is raised, bringing the head of the bolt against the bar and so clamping bar and frame together. Upon each of the frames a head block, E, shown in section in Fig. 1, is placed. This consists of two similar iron parts separated by a block at each end and secured by bolts. In the inner face of each part is formed a screw rack, F, and a rib or guide, G. This guide is received in grooves in the knee, H, which is provided with ears, I, that project downward, and a short arm, J, that is apertured to receive a stake, and beveled downward toward the saw end of the head block, to adapt it to the surface of the larger logs. The knee also carries the usual log hook.

Between the ears, I, and upon a shaft, K, Fig. 2, a tubular screw is placed, which is kept from turning by a spline in the screw and a slot in the shaft. Upon the end of the latter bevel wheels, L, are placed, which may be rotated by similar wheels on the shaft, M, so as to carry both knees forward at once at the rate of an inch for each revolution of the hand wheel. When it is desired to increase or diminish the distance between the head blocks, the cam lever, D, is raised so as to release the bar from the clamping device, when the frame, C, will remain stationary while the frame, A, is moved in either direction, as may be required, the bevel wheel imparting motion to the parts on said frame being loose on the shaft, M. The knees are made shorter than those in common use, to admit of rolling a large log upon a short head block.

Patented through the Scientific American Patent Agency, March 5, 1878. For further particulars address the inventor, Mr. James S. Scofield, Little Sioux, Harrison county, Iowa.

Solar Steam Power.

We recently mentioned the experiments of W. Adams, of Bombay, India, in boiling water by the heat of the sun. He has lately tried further experiments, as follows:

In the presence of several gentlemen of Bombay, 9 gallons of water were poured into a small boiler at 9:25 A.M. The rays of the sun were then directed on the boiler, and the water boiled in exactly 30 minutes. After boiling exactly

one hour the focus was turned off, when it was found that 3¾ gallons had been evaporated. In the experiment described above, he used 198 glass mirrors, each 15 inches by 9½.

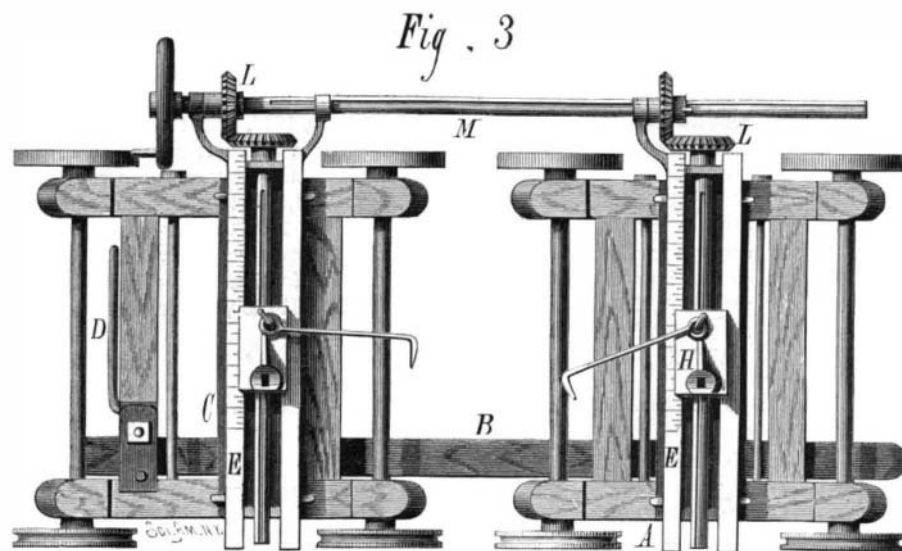
An Aerial Spy.

Mr. W. B. Woodbury has recently proposed an ingenious idea for taking photographs of an enemy's works from a balloon, without necessitating the presence of an aeronaut in the car. Electrical wires are run along the cable by which the air ship is held captive. Instead of a car a box is provided, inside of which another box is pivoted so that it will keep horizontal. In the inner box is the photographic apparatus, and over the lens is an ebonite shutter moved by the current, to open or shut instantaneously. There is also a sensitized tissue on rollers in rear of the lens, which is operated by clockwork, also controlled by the current. When the balloon is elevated to the required height, the lens properly focused and the tissue in position, the shutter is set in motion by the current, giving instantaneous exposure. A photograph is thus obtained, and by further controlling the clockwork fresh sensitized surface may be exposed and additional images taken.

Foreign Markets for American Goods.

Thanks to the genius of American inventors our manufacturers are now able to compete successfully with the most skillful of other nations, not merely in our home markets, but abroad, in many lines, even at the very centers of corresponding foreign industry. But this victory of mind over muscle has been so rapidly made that our commercial classes have not had time to adjust themselves to the new conditions. Our merchants have been slow to appreciate the advantages of their position; and are but just discovering that the great markets of the world are open to them. A little prompt action now on their part would capture for American industry some of the most desirable of those markets, and give an impetus to our machinery beyond anything we have yet known.

Last summer Secretary Evarts sent to our Ministers and Consuls in various countries a circular of inquiry asking information in regard to the conditions of trade and the measures likely to promote the foreign commerce of the United States. The *Herald's* Washington correspondent has compiled from the replies to that circular a large number of interesting statements with regard to the foreign demand for American goods and the conditions which prevent our meeting such demands. The hindrances arise chiefly from our lack of shipping facilities and apparent indifference of our merchants to the special needs of the various countries we might send our goods to. Indeed the *Herald* goes so far as to say that the general impression which the reports leave on the reader is that we Americans have almost forgotten how to carry on a foreign trade. The general result of the inquiry is summed up as follows: "American manufactures are better in quality than those of any other nation, are highly appreciated almost everywhere, and are in the main as cheap or cheaper than any others. But the trade in them is pushed with but little skill and energy by our people; our exporters act carelessly and do not in such matters adapt themselves to the necessities of different countries as carefully as the English and Germans. Dealers abroad complain that descriptive circulars and price lists are not full enough. Our manufacturers do not adapt their goods to different markets as readily as do those of other countries,



SCOFIELD'S SAW MILL HEAD BLOCK.

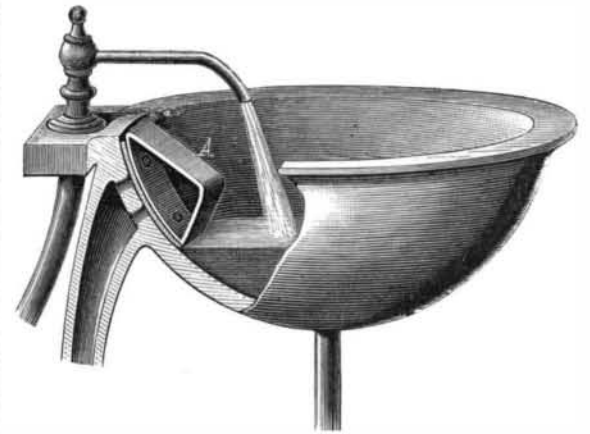
and communication with the United States is far slower and less certain than with Europe, even in the countries of South and Central America. But besides these general complaints there are two others which appear in almost all the reports, and which, the testimony shows, are vital. One is that our manufacturers and exporters do not maintain fixed prices, but vary them frequently, being compelled to this by the fact that we here are cursed with a currency of fluctuating value. European and South American dealers say that it is impossible for them to order American goods, even where these are greatly preferred and cheaper, because prices are

thus unsettled. The other complaint lies against our high tariff, which disables us from buying and importing foreign products, and thus forces merchants abroad to trade with England, because the outward freight on their purchases is lessened by the fact that the ship is sure of a return freight to Europe."

GILBERT'S WASH BASIN VALVE.

We illustrate herewith a new valve for wash basins, by means of which the sewer pipe is claimed to be as effectually closed as the water pipe ordinarily is, and that consequently no sewer gas can escape into the room. The valve being air tight, a partial vacuum is produced above the water trap, which prevents the rush of water through waste pipes below siphoning the water out of the trap. The construction is also such that the valve cannot be left open when the water is turned off or left shut when the latter is turned on.

The valve is shown at A in our illustration, and is hinged to the rim of the basin. It is made hollow, and of such a weight that as the water rises in the basin it is raised, and the holes covered are so opened that the overflow water may



GILBERT'S WASH BASIN VALVE.

freely escape. The lower surface of the valve is covered with leather, rubber, or similar material, to cause it to cover the overflow holes tightly.

Patented through the Scientific American Patent Agency March 19, 1878. For further information, address the inventor, Mr. John S. Gilbert, 202 W. 14th street, New York city.

New Mechanical Inventions.

A new Cutting and Boring Attachment for Lathes has been patented by Mr. Mathew Rice, of Augusta, Ga. It is a hand appliance for shaping, moulding, polishing, etc., which is driven by band pulleys and held to the work by handles. The apparatus is adjustable to a variety of uses.

Mr. John Schofield, of Cheyenne, Wyo., has patented a Flooring Clamp, consisting of a sliding presser, worked by a lever and ratchet gear, and mounted on a base plate which is securely fixed to the joist. The tool is applicable for clamping other work besides flooring.

A new Motor, invented by Mr. C. C. Gish, of Salem, Kan., consists of a heavily weighted chain wound on a chain wheel eccentrically, and operated by an engine, water wheel, or other power, the object being to utilize the weights on the chain as they descend.

In an improved Stamp Mill, invented by Mr. J. M. McFarland, of Virginia City, Nev., the essential features are the addition of auxiliary sliding tappets or weights, which are engaged by cams when the mill is run at a high velocity, thus adding to the impetus of the stroke; and the substitution of corrugated instead of plain screens, to increase their capacity for a given area.

An improved Bracket for Scaffolding, for use on shingled roofs, has been patented by Messrs. T. M. McClelland and J. A. Grant, of Mount Pleasant, Iowa. The bed plate ends in a chisel-shaped piece, which is driven under a shingle from below, and the butt of the shingle is held by a pivoted lever clamped by a screw. This gives a firm support for the scaffolding, additional brackets being used as required.

A convenient device for Lubricating Axles has been patented by Mr. L. H. Hinaman, of Long Eddy, N. Y. It is secured to the upper side of the axle, just within the collar, and by means of simple mechanism forces the oil out upon the axle arm when desired.

A Clothes Washing Machine, patented by Messrs. W. E. Armstrong and David Giesman, of Ludington, Mich., is of the class in which a reciprocating or pounding movement is employed. It has an ingenious arrangement of tubes and a rubber valve, by means of which air is forced through the clothes and water at the bottom of the machine, thus cleansing the clothes rapidly.

Mr. J. H. Herriff, of City Bluff, Mo., has patented a Car Coupling, in which the coupling link is secured in position over a retaining fin of the draw bar by means of a spring-acted hook, which is lifted by an angular lever and connecting rod when it is desired to uncouple the cars. The draw

bar is adjustable in height by being suspended by a chain and stirrup, which may be raised or lowered by turning a crank.

A novel construction of Railway Tracks, dispensing with wooden cross ties, has been proposed by Hermann A. Haarmann, of Osnabrück, Germany. A longitudinal box-shaped bearer with a broad base forms the support for the rail, which is secured to it by clamps and cross bolts. The bearer is supported on lateral iron cross ties, by means of side recesses and fastening bolts. The general idea is not new, but the details of construction and arrangement are original.

Mr. Samuel Arnold, of Silver Springs, Tenn., has patented a new Clothes Wringer which possesses several advantages. The rollers are of wood, faced with rubber, and the pressure is applied by means of wooden springs, which are formed into forks at each end and are capable of being reversed whenever they become set. The action of these springs is regulated by a convenient lever locking arrangement, adjustable as desired, so as to produce more or less pressure between the rollers.

An improved Car Brake has been patented by Mr. J. V. Ericson, of Escanawba, Mich. It can be operated from the engine, caboose, or any other part of the train, and the inventor claims that the system is less expensive and requires no more dead weight of iron than air brakes. It is designed especially for freight cars.

An improved Machine for making Cotton Batting has been invented by Mr. J. L. Norton, of Memphis, Tenn. It consists of a pair of compressing rolls, an accumulating cylinder around which the cotton is wound under the pressure of rollers, and a hot pressing roll, combined in a suitable manner.

Mr. John Hogan, of Fort Worth, Tex., has invented a new system of Car Coupling, in which each draw head is provided with both a hooked draw bar and a locking dropgate, the particular point covered by patent being the manner in which the draw bar is held in horizontal position by cushioning springs.

A Water Wheel invented by Mr. S. P. Mackey, of Brownsburg, Va., is in the form of a funnel, having a solid lower end with a socket at the bottom, and provided with buckets on its inclined sides, extending through about one quarter of the circumference. The inlet openings are on the inner surface of the sides of the wheel, and the outlet openings on the outer.

Communications.

Our Washington Correspondence.

To the Editor of the Scientific American:

The order of the Commissioner of Patents to the examiners whose cases were behindhand to work until five o'clock is beginning to produce its effect, so that there will soon be much less time to wait before a case is acted on, and inventors will thus be able to know without much delay whether their hopes of obtaining a patent are well founded or not. As one effect of the order, it may be noted that the last issue of patents, that bearing date April 16, is the largest one issued in any week for two years. The following are the numbers of each class: 302 patents, 16 reissues, 18 designs, 38 trade marks, and 6 labels.

The owners of these patents and those of the previous week's issue will have to wait for them some time longer than is usual, on account of the failure of Congress to make any appropriation for the printing of the specifications. It is not yet known how long the patentees will have to wait, as that depends entirely upon the action of Congress in passing the deficiency bill, and there appears to be no disposition to hurry matters at the Capitol. This failure of the appropriation is going to cause considerable trouble, and will offset for the present to some extent the good effected by the Commissioner's order, because, although the patents will be numbered, dated, and signed, as the specifications are not printed, the patents cannot be sent out, and inventors will have to do as well as they can without their long wished-for documents. It will, no doubt, be a cause of considerable annoyance to many patentees, and of actual loss to some, especially in reissue cases. The Patent Office, however, is not to blame in the matter, but the short-sighted pseudo-economy of Congress.

"PROTECTION" TO CASTINGS.

The House Committee on Patents has agreed to report favorably Mr. Saylor's bill "for the security of property in metal castings." It provides that any person counterfeiting any registered metal casting by using it as a pattern in moulding, without first obtaining the written consent of the owner of the registration, shall be liable to the latter in the amount of the ordinary wholesale profit upon the articles produced; and any court of competent jurisdiction may order the delivery of such counterfeit castings to the complainant, or their destruction by the marshal. The requirements to those wishing their rights in their castings protected are these: First, such castings must have upon them the word "registered," together with the date of registration; second, the names of the parties requiring the protection must be recorded in the Patent Office, and a fee of \$20 will have to be paid in the same manner and for the same purpose as the fee for a patent. The certificate of registration is to remain in force for 17 years. This is an iniquitous bill, inasmuch as it aims to empower the owner of a wooden pattern for an old stair plate, for example, which anybody can make for a dollar, the right to collect hundreds

of dollars damages of any poor fellow who uses one of the cast plates for moulding.

TESTING TORPEDOES.

The House Committee on Naval Affairs has agreed to report a bill appropriating \$250,000, to be expended in purchasing and testing the different styles of torpedoes known, with a view of reaching a conclusion as to the best and most suitable for use by the United States Navy.

PATENT REVENUE STAMPS.

It is reported that the Committee on Ways and Means are about to recommend a new system of collecting the revenue on cigars, said to have been patented by Mr. Chas. Ewing, the essential feature of which consists in putting a stamp on each cigar and another one on the box, those on the cigars having numbers to correspond with the number on the stamp. As every box stamp is to be furnished with a number distinct from all the other box stamps, a box that has been stamped and emptied cannot be used again without detection, as the numbers on the cigar stamps must correspond with the number of the box stamp.

IMPROVING THE MISSISSIPPI.

From reports lately received here, it appears that the channel at the South Pass is constantly deepening. From the head of the jetties to Section No. 105, a distance of 10,500 feet, there is now an open channel 250 feet wide and 24 feet deep. From that point to Section No. 115, a distance of 1,500 feet, the channel is 140 feet wide and 24 feet deep; and from the last point, for a distance of 40 feet, the depth is 23 feet. The estimated amount of material to be removed in order to secure a channel 250 feet wide and 24 feet deep entirely through the Pass is 65,000 cubic feet, according to the latest surveys, which, it is thought by the government engineer, will be accomplished within the next sixty days.

The House Committee on the Mississippi Levees have agreed to report a bill authorizing the appointment of a commission to report upon the improvement of the levees from St. Louis to the mouth of the river, to consist of three army officers and three civilians. The bill appropriates \$250,000 to defray the expenses of the surveys, the salaries of the officers, etc.

In this connection, it may be stated that Mr. M. J. Adams, of St. Paul, Minn., has lately been before the House Committee on Commerce, asking for an appropriation to test his invention for establishing permanent channels in rivers, which consists in a line of tubes laid in the bed of the river, provided with valves which open and close apertures through the tubes. Water is forced into the tube by a pump at the head, and a gate at the other end secures the pressure. By opening the valves covering the apertures in the tubes at any desired place, the water rushes out with such great force as to thoroughly agitate the sand or mud in that neighborhood, keeping it in suspension until carried away by the current into deeper water.

HATCHING SHAD BY STEAM.

The new method of hatching shad, in which steam machinery plays an important part, to test which an appropriation was passed by Congress last December, gives promise of being successful. A station has been established on Albe-Marle Sound, nearly a million of young shad have been planted in Virginia and North Carolina waters, and the work is expected to be largely increased before the season's close. The Smithsonian authorities recently received information that shad had been caught at the Falls of the Ohio river, and also in the Coosa, in Alabama, which is believed to be the result of the operations of the Fish Commission.

THE DECLINE OF AMERICAN NAVIGATION.

A statement has been prepared by the Bureau of Statistics, showing the value of the imports and exports of the United States, carried respectively in United States and in foreign vessels, during the 57 fiscal years ending June 30, 1877, with the percentages carried in American vessels, from which it appears that in 1821 the amount carried in American vessels was \$113,201,462, in foreign vessels \$14,358,235, the percentage in American vessels being 88.7. In 1826 the percentage was 92.5, since which time the percentage gradually declined, until in 1877 the amount carried in foreign vessels was \$859,920,536, and in American vessels \$316,660,281, or a percentage of only 26.9.

Washington, D. C.

The Flexible Wheel Base for Cars.—Letter from a Veteran Inventor.

To the Editor of the Scientific American:

Allow me to suggest to you that the "Cleminson Flexible Wheel Base System" for railway cars, which you give in the SCIENTIFIC AMERICAN of the 13th inst., is identical, apparently, with that patented by the undersigned in this country in 1839 or thereabout,* and which was adopted

*The patent referred to was for an improvement in railroad cars, by Lewis J. Germain, of Catskill, Greene County, New York State, issued May 7, 1839. The patentee represents in his patent a six wheeled car, having a separate frame for each pair of wheels; these frames operating upon each other, by means of a toothed segment and rack, or by means of jointed cross bars, on the middles of their sides of contact. The middle frame of the three which sustains the axles is so connected with the general car body frame above them as to allow a certain degree of vertical play to it, for the purpose of equalizing the bearing of the wheels on the rails; this is effected by means of what are called stands and slides. The wheels are thus to adapt themselves to the curvatures of the road and to its horizontal deviations. The claims are to the stands and slides in combination with the middle and top, or body frame, in the manner described, and to the manner of connecting the three axle frames together, by a single or double cross joint, or a rack and segment wheel.

and used on the old Catskill and Canajoharie Railway, N. Y., from that time until its failure and abandonment in 1840, and with the same satisfactory results, as the London Engineer, as quoted in your article, certifies for it, as used in England. The above railway was one well adapted to test the practicability of the plan, it being very tortuous, as located through the gorges of the Catskills, having one curve of less than 100 feet radius, and several from 400 to 1,000 feet radius. We tested them for lateral friction, and found, by indication on dynamometer, that, excepting at the instant of entering curve or tangent lines, the difference between them or curved and straight lines was of but slight amount. We found also that the wear and tear of this form of our rolling stock was very much reduced, and the repairs for the time used was as 4 to 10, being 60 per cent in favor of mine. I have the certificate of the acting directors and superintendent of repairs of the corporation to that effect, as I remember; but I have it not at hand, and may not be quite exact. Mr. Knowles, afterward actuary in your patent agency office, as I have been informed, assured me, when calling on him at the Patent Office at Washington—in 1840 or thereabout—that there was not a model of railroad machinery in the office more frequently called for for inspection than mine. So it would seem that there must be many still living who will remember it. I was induced to attempt the invention from the stimulus of a liberal reward offered by the Belgian Government in 1835 for the most perfect plan for obviating lateral friction on railway curves, enforced by the advice of my chief and preceptor in civil engineering, the late distinguished Major Ephraim Beach.

My professional friends all seemed to regard my invention as about theoretically perfect, and placed its prospective value at a high figure, so high as to quite puzzle me to determine what amount of good I could do with it, and I am still in doubt about it. There was one pretty serious objection to the plan, as operated on the wooden stringer and strap rail of those early days of our railway building; for although these cars of mine were not apt or liable to jump the track, yet when a "snake head" or broken rail had seduced them from their proper path it took whole panels of fence rails and any quantity of green saplings, enforced with strong remarks—in fact, denunciations on the contriver and contrivance—before they could be reinstated, and be induced to take to their narrow ways again. But it was want of capital, and lack of the knowledge that it is more difficult to farm a patent than to invent it, that prevented me from introducing it generally. But, however, it is not my object in writing to you to claim any particular credit in this matter, or to detract aught from that of my brother engineer, Mr. James Cleminson, in England, who has not only re-invented a valuable improvement, but has got it well introduced into use, and is in a fair way to bring it into general use. I wish him good speed and ample reward for his efforts in this line of railway improvement.

Yours very truly,

L. J. GERMAIN, formerly a C.E.
Cuyahoga Falls, Ohio, April 16, 1878.

Mechanical Oculists, and how they Treat Cinder in the Eye.

To the Editor of the Scientific American:

The best and most effectual treatment, and one which will give immediate relief from suffering caused by extraneous matter, loose in the eye, or attached to the eyeball or eyelid, is by extracting as quickly as possible said foreign substance. This is an operation frequently performed in our workshops, and very often in the machine and brass finishing departments, and always resulting in speedy and sure relief. To those who may not be as familiar with the operation as mechanics generally are, I will give a short description of the *modus operandi*. A keen, sharp, smooth edged penknife and a steady nerve are all that is required on the part of the operator, and for removing floating and loose substances the penknife will more readily attach itself to them if the point be magnetized by rubbing it on a common horseshoe magnet. Thus prepared, take the sufferer where you can have the benefit of a good light, and let him stand up and lean his head back against the wall, door jamb, or other suitable place; this is necessary that he might be able to hold his head steady. Then by standing square in front of him carefully examine the eyeball, and the corners of the eye, at the same time requiring the person to roll his eye to each side, and upwards and downwards, and by pulling down the lower eyelid explore the lower part of the eye and its cover, next catch the upper eyelashes between the thumb and forefinger and turn over the eyelid; this is usually done over the back of the penknife or a pencil; by this means the upper part of the eye and lid can be inspected. In the examination should the minutest speck be observed, examine it closely to determine whether it be a small blister, or pimple, or some foreign substance; if the former, let it alone severely, but if the latter remove it with the sharp point of the knife with a firm and steady hand. Some attempt this with a punching, spasmodic, nervous, picking motion; but to perform it skillfully it must be done with a confident, sure, cutting stroke, just as though it were to be sliced off, and, if possible, to cut the piece or strike it without touching the eye. The most difficult operation that we are called upon to perform is when a minute particle of iron or grindstone grit becomes firmly attached to the pupil of the eye. The eye becomes quickly inflamed from the irritation, also weak and watery, making it painful to open the eye, and if