Correspondence.

How to Silver Glass.

To the Editor of the Scientific American:

I have frequently noticed in the SCIENTIFIC AMERICAN, and also some of the SUPPLEMENTS, under the heading "Silvering Glass," various silvering solutions, such as are used in the plating of mirrors, and as I have tried each one of them myself and attained results far from satisfactory, I beg to send herewith formula for a silvering solution which contains only a small percentage of silver compared with others which I have unsuccessfully tried, and which will invariably produce excellent mirrors, provided the following conditions are adhered to:

1. Pure chemicals.
2. Have the glass chemically clean.
3. Adhere strictly to the formula.

And I trust that other readers of the SCIENTIFIC AMERICAN who have been endeavoring to silver glass with the other solutions heretofore given will advise you of the superiority of the following:

1. Solution.—Dissolve 2½ drachms nitrate of silver (crystals) in 2 ounces of water, and add concentrated liquid ammonia, drop by drop, until the brown precipitate formed is nearly, but not quite, all dissolved; then add 24 ounces water, and filter three times.

2. Reducing Solution.—Dissolve 1½ drachms nitrate silver in 24 ounces of water; then take 1 ounce of water in a graduate and dissolve in it 30 grains white caustic potash, and add this to the 24 ounces of solution just mentioned; then add 420 grains Rochelle salts. Filter three times.

Note.—Solution No. 2 will be found to have a heavy black precipitate, and it is necessary to filter same until it is perfectly clear, which can be accomplished by having three funnels one above another, with filtering cotton packed in rather tightly.

Use distilled water.

To use the above solutions, mix equal parts of No. 1 and No. 2 together, and flow over the glass, which, however, must be in a room heated to about 90 or 100 degrees F. Yours truly, JOHN BREFFITT.

No. 407 Sherman Street, Wilmington, Del.

[We have tested the formula printed above and find that it gives excellent results. Two parts of No. 1 to one part of No. 2 by measure gave better results than equal parts. The glass should be cleaned with caustic potash dissolved in water and should be thoroughly rinsed before silvering. The process of silvering can be hastened by having a steam table on which to lay the plate of glass over which the combined solutions have been poured. A gas stove or an oven may be used. Small pieces of glass can be silvered in one to two minutes by holding them a few inches above the flame of a Bunsen burner. Defective spots may be remedied by removing the silvering around the spot with nitric acid and resilvering. If the hands become stained with the solution, rub the stains with a crystal of resublimed iodine until the color begins to change, then sponge with alcohol. Only small pieces of glass should be attempted at first until the method of working the process is well understood.—Ed. S. A.]

Concerning a Change of Policy in the Administration of the Patent Office.

BY PHILIP MAURO.*

The views presented in these pages were called forth by the announcement of a rumor that the present Commissioner of Patents had decided to inaugurate a decided change of policy in his office, in the treatment of applications for patents where the margin of novelty is small or the exercise of invention doubtful. The old rule, unwritten but tacitly recognized, has been: When a substantial doubt exists, to give the applicant the benefit of it. This rule, it is said, has been reversed.

The particular point of inquiry is, whether the examining corps of the Patent Office has been so lavish, lax and imprudent in the issue of patents, particularly where the novel improvement sought to be covered was of a trifling character, that the public interests have been detrimentally affected. If so, what are the particular evils that bave resulted from this undue liberality, and how far should the Patent Office shift its ground in the other direction in order to avoid them?

In so large a body of men as the examining corps there is, of course, great diversity of character, disposition and mode of action. In the exercise of judgment upon applications for patents, we find the two extremes of undue liberality on the one hand and excessive strictness on the other, and this will always be so; but no one competent to judge will deny that, up to the present time, the work of the bureau as a whole has been characterized by fairness, just discrimination and due appreciation of the rights of inventors, with a leaning rather in the direction of the more illiberal and narrow decisions which have in recent years emanated from judges of small experience in patent matters and of slight acquaintance with the actual steps of the process whereby the development of the useful arts is effected.

Unless the actions of the examining corps as a whole have been lax, careless and unduly liberal (which certainly is not the case), it is clear that the sum of all the effects of a change in the direction of greater stringency must be detrimental and injurious. The easy-going and indulgent examiner (how many such are there?) may be restrained from improvident grants, but the man of fair mind and sound judgment will feel impelled to refuse patents which, in the untrammeled exercise of his discretion, he would ordinarily allow; while the strict constructionist, whose dominant motive appears to be hostility to inventors, will be confirmed and encouraged in his disposition to perceive an antagonist in every applicant for a patent, and to dispute and place obstacles in the way of every claim that is submitted for allowance.

The proposition at this point is simply that the policy of the Patent Office as a whole in the treatment of applications has not heretofore been liberal to the point of laxity or improvidence. The only basis that I am aware of for any opinion to the contrary is the fact that many patents have been held by the courts to be void or illegal grants, on the ground that the subject matter was not patentable, or did not, in view of the evidence and character of the results achieved, rise to the dignity of an invention, or involved merely the exercise of mechanical skill.

But admitting the full force of the fact that certain examiners, in certain instances, have erred on the side of excess of liberality, what are the consequent evils as compared with those of errors in the other direction? The grant of a patent is, in ninety-nine cases out of a hundred, an act without any consequences whatever. But so potent for good is the hundredth invention—the one that contains the germ of vitality and usefulness—to such an extent does it stimulate the exertions of other inventors, that it more than pays for all the failures. The chances, then, of issuing one patent too many are infinitely small as compared with the chances of prematurely stifling and suppressing what might be productive of benefit; so the greatest care in conducting the work of the Patent Office is needed to guard against actions which both work injustice to meritorious inventors and at the same time injure the public by depriving them of the advantage which inevitably accrues from the grant of a patent for a useful novelty, however trivial.

As to the ultimate career of an invention, the judgment of the most experienced persons is ordinarily worthless. Frequently it is the things that promised least from which the best results have followed, and *vice versa.* It appears strange at first, and yet entirely explicable upon reflection, that the novelties which contain the greatest amount of "invention" and ingenuity are often of the least practical benefit. Machines which are marvelous products of inventive skill, and full of the most intricate and complex mechanism, for which a patent will be granted with enthusiasm, become frequent but curious exhibits of misdirected inventive imagination; while, on the other hand, the inventor who aims to effect but a slight departure or simplification of what already exists is the one who really benefits himself and the community. It is by the accumulation of small changes of this nature that the industrial arts advance, step by step, in ever-increasing usefulness.

It is in partial appreciation and recognition of this fact that the accepted policy of the Patent Office has heretofore been to give the inventor the benefit of the doubt in marginal and doubtful cases. Experience shows this to be the safe and wise policy.

But we have of late heard the reverse of this policy termed "giving the benefit of the doubt to the public." This expression thinly conceals the fallacious idea that in rejecting a patent for a new but slight improvement, it is thereby given to the public. Nothing could be more delusive or contrary to actual experience. It is the grant of the patent, not its refusal, that gives the invention, great or small, to the public; and even the grant is but a step in that direction. After that, it requires the utmost persistence, the most favorable conditions the enlistment of capital and enterprise, to make the blind and heedless public see that the change will be beneficial, and to force the stolid and reluctant public to adopt it. The notion that an improvement comes into possession of the public when the discriminating examiner had decided that it is too trivial for a patent is one that cannot exist in any mind after a most superficial consideration of the facts. The very contrary is the case, namely, that the most effectual way to prevent its ever coming into the possession of the public is to thwart the inventor's efforts to secure a patent for it.

If judges have sometimes differed from the examiners as to what constitutes a patentable invention, I can see in that no reason for hesitation in the granting of patents for fear the courts may find an occasion for such difference of opinion. The chances are that the judges were mistaken in many of these cases; and if they have corrected errors in others, they have simply discharged one of the purposes for which courts are established, and were certainly, with the evidence on both sides before them, in a better position to pass the final judgment than the examiner could be. Let the Patent Office, then, pursue its course courageously, leaving to the courts their proper functions, and not risking, in the attempt to avoid a harmless error, the perpetration of a cruel injustice to the individual and a serious damage to the public.

If we ask where a material injury has been done by an excess of liberality in the decision of an examiner, it would be difficult to find an instance. If we ask in how many cases have patents for meritorious inventions failed because of the persistent and successful efforts of examiners to narrow the terms of the claims, it would be impossible to determine the enormous total.

The catalogue of the reissue decisions contains the history of grievous wrongs and injustice, due in many instances to the inability of the inventor, through lack of means or of competent solicitors, to combat successfully the opposition of an examiner.

The grant of a patent to an applicant for more or other than he can sustain before the courts profits him nothing, and deprives the community of no right. The failure of any inventor, who has communicated to the public his discovery, of whatever magnitude, to secure a grant to the full extent of his right, is occasion for profound concern, against which the officials of the patent bureau should be constantly on the alert.

In making investigations and advising applicants of the results of such investigations, to the end that they may not through ignorance claim things that are really old or already patented to others, and for want of such information be led to difficulties and loss, the Patent Office is performing a magnificent service to the country. For that service it is equipped with facilities and with a trained corps of experts, the like of which exists nowhere else in the world. It is in this respect that our patent system is incomparably superior to any other. To what end are these elaborate investigations made, and for what reason are they beneficial to the public? He who supposes that the main object and beneficial result is to suppress in defense of public interests the issue of patents that could not be sustained, is surely in grievous error. That such is not the case is proved by the workings of the English patent system for over a hundred years, and by the practice of every country of Europe where, with the exception of Germany, patents are granted without any investigation whatever.

Nothing but actual or willful blindness can prevent recognition of the fact that to arrest the grant of a doubtful claim, for fear that the patentee might in some way use it unjustly or mischievously, is the least of all the purposes which the Patent Office is expected to fulfill. No; the object and the merit of the examining system is that it advises inventors of the state of the art, and thus prevents them, not from imposing upon the public, but from deluding and injuring themselves, If, with the results of the examiner's researches before him, and with but a slender margin of novelty remaining, the applicant assumes the risk of a favorable judgment by the courts, and is willing to pay the required fee for a patent of doubtful value, I can conceive of no possible reason why the Commissioner of Patents should interpose objection. So far as I can see, after the best consideration I am able to give to the matter, the only question involved is a fiscal one; and while it would often, in such a case, be a friendly act to the inventor to prevent his paying $20 into the Treasury of the United States, that is surely his affair.

* Abstract of a paper read at the 84th meeting of the American Institute of Electrical Engineers, New York, February 21, 1894.

Plaster of Paris.

The method of testing the quality of plaster of Paris is by taking a small pinch of the powder between the thumb and finger and gently rubbing it; if small particles of grit are felt, it indicates that parts of the plaster have already absorbed water, and it is therefore unfit for use. The same test may be observed by taking a pinch of the powder again and placing the fingers under water, and then rubbing in the same way as before. If, however, in both of these tests no grit is felt, and under water a thin, creamy substance is formed, which is easily rubbed off the fingers, the plaster is in a proper condition for use. Where plaster has been kept for a long time, or where it is gritty, its condition can be very greatly improved. It may be redried by putting it in a metal dish, such as a pie plate or iron pot, and placing in an oven of a hot fire or over a gas jet. As soon as it becomes heated it will be observed that a process identical with boiling water is taking place. When this ebullition has entirely ceased, the powder is freshly kiln-dried. If the method of testing is again resorted to, it will be found that the gritty appearance and feeling will have disappeared, in a very large measure, leaving only the fine, dry powder ready for use. If there are any lumps remaining, they may be removed by the use of a sieve. From what has been already said, it will need be but a reminder that the plaster of Paris must always be kept in a hermetically sealed jar, or in a very dry place.—*Charlotte Medical Journal.*