

## Correspondence.

## A Cheap Fluorescent Screen for X Rays.

To the Editor of the SCIENTIFIC AMERICAN :

It may interest some of your readers to know that a good fluorescent screen for X ray experiments can be made by coating a piece of pasteboard with prepared glue and sifting on a coating of common zinc white (oxide of zinc), which can be obtained very cheaply at any paint or drug store.

It is not quite equal to tungstate of calcium, but fluoresces brilliantly enough to make a really excellent screen for most experiments, and the cost is much in its favor.

The fact that none of our X ray investigators have noticed—in so far as I know—the fluorescence of this very common substance may be an incentive to still further investigation in this line and possible discovery of something still better than the tungstate of calcium. Middletown, N. Y. H. C. OGDEN.

## Recent Patent and Trade Mark Decisions.

Dunbar v. Eastern Elevating Company (U. S. C. C. N. Y.) 76 O. G. 788.

Portable Elevators.—The Dunbar patent, reissue No. 10,521, has been held novel and patentable. The court says: "The idea of moving the elevator leg to the hatch of the vessel instead of moving the hatch of the vessel to the elevator leg was certainly a brilliant and ingenious one." It would not be suggested by the patent to Sykes, No. 95,747.

Reissue of Patent to Secure Canceled Claims.—Where claims were canceled because of the belief that another patent was prior, they may be obtained by reissue if this is found to have been a mistake and the application be seasonably made.

The "Whereby" Clause in Claims.—The "whereby" clause in claims is descriptive of operation and function, and since it adds no new element to the combination, it is immaterial.

Infringement.—An infringer cannot escape by varying non-essential details. They cannot take the substance of an invention and leave the shadow.

Mullen v. King Drill Company (U. S. C. C. Ind.) 76 O. G. 790.

Grain Drills.—The Mullen patent No. 355,462, for drilling seed between corn rows, is valid.

American Soda Fountain Company v. Green (U. S. C. C. Penn.) 76 O. G. 964.

Novelty of Combination.—The fact that all the elements of a combination may be found partly in one structure and partly in another is unsafe ground for overturning a patent. Where the desired object is accomplished by the mutual relation and co-operation of the several parts embraced in a claim, it is a combination and not an aggregation.

Soda Water Apparatus.—The Witting patent, No. 414,272, has been held valid as to claim 2.

Beale v. Spate (U. S. C. C. N. Y.) 76 O. G. 965.

Stair Pad.—The Sperry patent, No. 363,695, has been construed and limited to specific description. The law is imperative that a patentee must be confined to his claims, when clear, although he may have needlessly restricted them.

Knight v. Bagnall (Sec'y of Int.) 76 O. G. 1115.

Appeal from the Commissioner of Patents to the Secretary of the Interior.—No appeal which seeks a reversal of a judicial or quasi-judicial act of the Commissioner of Patents can be made to the Secretary of the Interior.

Ex Parte Schaeffer (Com. Dec.) 76 O. G. 1118.

Application for Joint Invention.—An application for a joint invention must be made by all of the joint inventors and cannot be made by one, although he requests it to be made to all the joint inventors

## Prices of Bicycles in England.

A question is continually being asked as to whether the prices of cycles will not drop; and the question is generally followed by some remarks on the cheapness of iron and steel. A visit to a high-class cycle factory would go far to explain the reason for the apparently high prices of first-class cycles. Consider first the parts which join the tubes of the frame; these can be made either of malleable castings or of steel stampings. Now a malleable casting, if perfect, is probably as good as a steel stamping, but it is not to be depended on. It may have a flaw somewhere, generally caused by an air bubble in the metal, which cannot be discovered. It may happen that this particular flawed casting does not play a very important part in the economy of the machine; if so, all may be well. But it may also happen to be one of the chief bearings of the machine, and disaster may arise through it. Therefore steel stampings are used in the best machines, because they can be trusted. There is every temptation to use the casting, for it costs only 3d. or 4d. per pound, and it requires very little work upon it before it is ready for use; and moreover, as very little metal is cut away from it, there is much more usable material

in the pound of castings than of stampings. The steel bars for these latter will cost about 9d. per pound, and from the bars they have to be struck out into the requisite shapes by massive stamps. The "blank," as it is called, for a hub, for instance, will weigh about six pounds; it is passed through ingenious and expensive machinery, and subjected to skilled labor, and the finished article will weigh about five ounces. When it is considered that a similar process is followed for many other parts of the bicycle, it will readily be seen that, although a fairly reliable bicycle can be bought for about £10 or £12, it is not surprising that for a machine of the highest class, with the watchlike accuracy and perfect finish which is now attained, £18 or £20 should be asked. Some makers compromise by using malleable castings for the less important parts; but a few of the best makers do not use a scrap of malleable metal in their machines. On the question of the price of cycles, it has been pertinently asked why it is, if English prices have been inflated, that foreign makers, who have long been building some excellent machines, did not come over and undersell the home manufacturers. There was no tariff to stop them; and patriotism has not prevented the Englishman, in the case of other articles, from buying foreign wares if he could get them cheaper than and as good as his countrymen's produce. Evidently the margin of profit was not sufficient to tempt the foreign maker.

There is, however, some reason to anticipate that the prices of cycles will fall somewhat next year. In the first place, the charges have been undoubtedly excessive in the past season, owing to the enormous "boom" which flooded the factories with orders which they could not complete. Machines could not be turned out quickly enough, material was not to be had, and consequently eager purchasers had to take what they could get and pay a high price for it. Secondly, as a natural result, newcomers flocked into the trade; "small" men have done business which has caused them to prepare for bigger trade next year; while the old-established firms, inundated with demands, have launched out into all sorts of extensions, and have made contracts to enable them to secure largely increased outputs for 1897. Thirdly, there is the foreign invasion, chiefly American. The Americans had their boom a year or two ago, and built huge factories; they have evidently had plenty of stock on hand, and they have seen their opportunity to establish a trade by supplying those whom the English manufacturers could not satisfy. They have got a firm footing now, not only here but abroad, in parts where the Englishman might have contested the position with them if he had not been swamped by his prosperity. They will certainly have to be reckoned with as factors in next year's trade; and as they are preparing for increased output also, unless the "boom" not only continues, which it will almost certainly do, but also increases very much, which is not so sure to happen, there is a great possibility of our being overstocked. And in that case prices will fall, although the man who is waiting to buy a first-class machine for about £8 or £9 will have his savings by him for some years yet.—London Telegraph.

## Country Houses and Polluted Wells.

The danger attending the taking of houses in the country for the summer season without making full inquiry into the water supply has frequently been alluded to in these columns. Nearly every farmhouse derives its water supply from a shallow well, and it is only too commonly known that in the great majority of cases the water obtained therefrom is more or less seriously polluted. Unfortunately, in consequence of the present state of the law, these wells can only be closed by a magistrate's order, and then only if there be proof that the water is actually injurious to health. For this reason the efforts of the most energetic medical officers of health and sanitary authorities to obtain purer water supplies are often frustrated. From time to time, however, cases occur in which the owners of such houses have to pay dearly for neglecting to provide proper water supplies. Within the last few days such an instance has been reported. A man hired a farmhouse in Essex for a season and sent down his family. The children were first attacked with diarrhoea; then one became more seriously ill and was found to be suffering from typhoid fever, from which the child unfortunately died. The water, upon examination, was found to be polluted, and the parent of the deceased child commenced an action in the Queen's Bench Division against the owner for damages. Lord Russell, in summing up, said there were two questions for the jury to consider: (1) Was the water so polluted as to be unfit for human use? and (2) Was the illness of the children caused by the polluted water? The evidence was of the usual contradictory character, but the jury decided in the affirmative on both points and awarded the plaintiff £75 damages. The conclusion of the case was in one sense satisfactory, but no amount of damages can compensate for such a loss. Still, the fact that farmers and others who let such houses are liable to be mulcted in damages for illness caused by drinking water from their polluted wells cannot fail to produce a salutary

effect. Before renting rooms in such places the quality of the water supply should be carefully inquired into, and where there are grounds for the slightest suspicion the place should be avoided unless some certificate is produced from a medical officer of health or other competent person, who has not only examined the water, but also investigated the source from which it is derived, to the effect that it is safe for use for domestic purposes. If this precaution were taken, not only would the health of the visitors be safeguarded, but farmers and others letting such premises would seriously endeavor to provide supplies of water above suspicion. This is no imaginary danger, and the father of a family who ignores it has himself chiefly to blame if disastrous results follow the neglect of such a simple precaution as we have indicated.—The Lancet.

## Natural Cold Storage.

The Spectator tells how Mr. Henry Seebohm, a famous English ornithologist, surprised from Nature her secret and discovered her great cold storage system.

In the course of his researches he was led to visit the Petchora River, which flows from the Ural Mountains into the Arctic Ocean near Nova Zembla. Along the lower part of the river he found what seemed a most uninviting district—an uninhabited, treeless swamp, stretching on either side of the stream, and known as the tundra. Higher up the river was the great Siberian forest, but here in the tundra was nothing but hard, frozen snow. Yet this unattractive spot was found to be the summer home of half the bird population of the Old World.

Mr. Seebohm reached it in the beginning of April. Forest and tundra were as bare of life as the Desert of Sahara, but a change was coming. Suddenly summer broke over the scene, and with it came the birds. The ice in the river split and disappeared, the banks steamed in the sun, and innumerable birds of all sizes and colors appeared within forty-eight hours after the first warmth.

The once frozen tundra now showed itself to be a moor, with here and there a large bog and numerous lakes. It was covered with moss, lichens, heath-like plants, dwarf birch, and millions of acres of cloudberry, cranberries, and crowberries. This was the storehouse of the feathered tribes.

The perpetual sun of the Arctic summer causes the plants to bear in wonderful profusion, so that fruit is abundant. But fruit bearing does not come before blossoming, and blossom and fruit cannot be perfected in forty-eight hours. The little travelers were arriving by thousands. The fruit would not be ripe until the middle of or end of the Arctic summer, and if the birds had to wait till then they must needs starve.

Not so, however, does Nature provide for her pensioners. Long before the snow melted provision had been made for their maintenance. Beneath the snow lay the whole crop of last year's fruit, perfectly preserved by Nature's system of cold storage.

Each year, when the berries are ripe, and before the birds can gather them, the snow descends upon the tundra, effectually covering the crop and preserving it in perfect condition until the spring sun melts the snow and discloses the bushes loaded with ripened fruits, or, in some cases, the ground beneath the plants covered with the fallen treasure, waiting for the hungry strangers.

## Street Railway Fares.

Extraordinarily low rates per mile are indicated by the distance for which a passenger may ride for a single five cent fare, by the use of transfers, on some of the street railways, as may be seen in the following table compiled by the Street Railway Journal:

City.	Track mileage.	Miles for 5 cents.	Rate per mile.
New York.....	458	12.5	0.0040
Chicago.....	760	15	0.0033
Philadelphia.....	462	11.75	0.0043
Brooklyn.....	393	18	0.0028
Boston.....	275	9.9	0.0051
St. Louis.....	335	15	0.0033
Jersey City-Newark.....	175	8.25	0.0060
Cincinnati.....	263	10	0.0050
Milwaukee.....	159	9	0.0056
Denver.....	212	11.5	0.0043

Brooklyn appears to take the palm by giving an electric railway ride of 18 miles for 5 cents, but Chicago beats this in the case of a steam road which carries passengers a straight trip of 21 miles for a single nickel, and goes to the expense of printing, selling, collecting and auditing a ticket for each trip also. But, taking the average distance traveled, street railway rates are not so remarkably low compared with those of steam roads, for an immense number of their fares are received for short trips of 1, 2 or 3 miles, for which 5 cents is a profitable rate, and passengers are constantly leaving and arriving on every run through a populous city. On the long runs the business would be done at a heavy loss were it not for the large returns from the short trips.

An inscription has been put on the Matterhorn reading: "Notice.—This hill is dangerous for bicycles."