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A WORD TO OUR SUBSCRIBERS.

Many of our subscribers will observe, printed in red ink on the wrapper covering this week's copy of the SCIENTIFIC AMERICAN, the announcement that in three weeks their subscription will be exhausted. The year and the volume thus expire, and we give notice a little in advance, and solicit a prompt renewal of all subscriptions, in order that our readers may experience no stoppage in the receipt of the journal, and that we may not miscalculate the quantity of paper to print at the commencement of a new volume.

The plan of discontinuing the paper when the time expires for which it is prepaid, we think preferable to the course adopted by many publishers, of continuing their paper indefinitely and collecting afterwards. The latter course is too much like having a bill presented for a suit of clothes after it is worn out. We shall be gratified to have every old subscriber renew, and doubly grateful if each will send one or more new names with his own.

We hope those of our subscribers whose term is about to expire, as admonished by the notice on this week's wrapper, will not delay in remitting for a continuance of the paper. The safest way to send money is by postal orders, bank checks, express, or draft on New York, payable to the order of Munn & Co. Little risk is incurred in sending bank bills by mail, but the above methods are safe beyond any contingency.

BETTER TIMES.

The feeling of insecurity with regard to financial matters, which for the past two months has clogged the business interests of the country, is becoming rapidly dispelled, and people are beginning to realize that after all the hue and cry the panic is but a specter, mainly due to their own imagination. It was, in fact, a gigantic scare, a veritable panic, as baseless as the frantic rush of a crowd in a building on the shout of "fire," while its victims may be likened to such of the hapless bystanders as are trampled beneath the feet of the surging multitude.

Like all great storms, this one has left its ravages, which will doubtless be felt for some time to come; but in the main the horizon is clear and there is every prospect of a speedy return of business to its former channels. The subject has been freely discussed, theories innumerable have been ventilated, and dismal forebodings indulged in to an unlimited extent, until, as a sensation, the novelty of the excitement has died out. The talkers, therefore, having had their say, the workers, cool headed and far seeing business men, are striving to act; and while the former are now devoting their oratorical talents to the Spanish complications, the latter are busily endeavoring to repair the damages of the disaster.

Marked signs of improvement are exhibited in the reports from various quarters of the country, and notably so from the New England States. Total suspension, says an authority, is, in the majority of cases, being modified to half or three quarter time, and hands thus furnished employment are receiving wages enough to keep want well away from their doors. Collections are generally easier, and the record of protests of commercial paper and of suits in involuntary bankruptcy is largely diminished.

The mines of Pennsylvania have been kept open, although working hours have been reduced. The men have cheerfully accepted the situation, believing that small wages were better than absolute idleness. The iron masters, it is said, will shortly resume operations, although many have suffered very severely, notably for the cessation of orders for railroad supplies. Their renewal will necessarily assist the coal trade. Among the manufacturers there seems to be a general impression that the trouble is past, and we note that resumption of

business are extensively in progress, although in many cases it has been found necessary to continue reductions of time and wages. The tobacco interest has suffered but little. The jewelry manufacturers had experienced a stagnation in their trade, but this is reported to be gradually passing away. The knitting-mills of the northern part of this State are rapidly receiving orders, and improvements in buildings and machinery are progressing as usual. It is expected that the great establishments in Cohoes, N. Y., will start on full time again as soon as the water is let on in the canals. The safe dealers have reduced prices and sales are said to be brisk. The dry goods trade is recovering, and a good holiday business is anticipated.

The war contingency, while serving to divert the popular mind from the financial stress, is becoming the means of supplying work for large numbers of men. We note the following important contracts, which indicate brisk business for several of the largest machine shops in the country: John Roach is to build engines and machinery for one new sloop of war, to cost \$630,000; for two similar vessels, at 580,000; to repair four monitors, at \$720,000; and to build two engines for \$366,000. Quintard & Murphy are to construct engines for two sloops of war; the Delamater Iron Works, to repair the "Dictator." Atlantic Works, of Boston, to repair two vessels; Hartford Iron Works, engines for sloops of war; Wright & Co., of Newburgh, similar work; Cramp & Sons, of Philadelphia, are to overhaul four monitors; the Harlan & Hollingsworth Company are to repair three ships of the same type, and it is stated that the Navy Department has more contracts yet to issue.

The effects of the disaster had been severely felt in the eastern States before the magnitude of the panic had become fairly comprehended in the West. In spite of this fact, however, the work of recuperation seems to be as rapidly advancing in that section of the country. The iron interest of Cleveland was embarrassed for a time; but as a rule, we learn that there has been scarcely any reduction either of force, wages, or time in the factories and shops of the city. In Cincinnati, of the 12,000 workmen there employed, it is stated that hardly five per cent of the total have lost their places; while from Dayton and Columbus comes a similar report. Local journals go so far as to state that this is even an improvement on the usual condition of affairs at this time of year. From Chicago, St. Louis, and Louisville, advices are generally encouraging; and the same is true of recent reports from Baltimore.

We regret to notice reductions of wages on some of the railroads, notably on the Delaware, Lackawanna and Western. We hardly think that the best interests of these great and wealthy corporations are served by such a course, and consider that it would be wiser to exhaust every other means of retrenchment prior to diminishing the incomes of those whose labor they employ.

Altogether the feeling manifested throughout the country is encouraging, and the general condition of business is uniformly quoted as sound. There is an abundant demand for our products, enough to maintain all our industries; so that, we believe, it will involve only the length of time required for the excitement completely to die away before trade will be resumed, with even an increased vigor.

ON THE PURCHASE OF PATENTS.

Complaints of fraud are sometimes made by purchasers of patent rights, who pay their dollars and receive their deeds, only to find out that the latter are defective and the money lost.

Example 1. A buys from B one half of all B's right in a certain patent, and takes it on the supposition that B owns the whole patent, but without instituting any examination to ascertain if such is really the fact. After the purchase, A employs an attorney to examine the records, and finds that B, at the time of the sale, was the owner of only one half of the patent; consequently A's title secures to him only one quarter of the patent, not one half as he supposed. A simple examination made before the purchase would have saved A from the loss.

Example 2. A contracts verbally with the patentee, B, for the exclusive right to make, use, and sell an invention during the lifetime of the patent, pays the money, receives the deed; and without examination of the document, supposing it to be right, places it on record and closes the transaction. Thereafter, on examination, it appears that the words, *the exclusive*, were omitted from the deed, the letter *a* being used in place. The deed, therefore, only conveyed a right to make, etc.; leaving to B the privilege of granting as many other rights as he might choose to the business competitors of A. Had A taken the precaution to employ an experienced attorney to examine the deed before paying the money, he might have really secured what he bargained for.

Example 3. A buys a patent, supposing it to be the only one ever granted for the special improvement claimed. It bears the genuine official marks of government origin, looks straight in all its forms, and appears to him to be all right. Without making a search, he pays the money, takes the deed, and proceeds at once to manufacture the article. After much labor and the outlay of several thousand dollars for mechanism, he succeeds in putting the goods on the market, when, to his astonishment, he is served with legal papers as an infringer of some prior patent; and only gets clear of the trouble by paying damages and buying an interest in the first patent. He is thus compelled to pay twice for the same article, which he might have avoided had he employed the services of proper persons to examine as to title and infringements prior to the first payment.

Example 4. A contracts for a patent, supposing that the

device is a new thing. Surely, he thinks, the government of the United States would not issue a patent for an old device. He therefore concludes that it must be all right, pays the money, and receives a deed. Infringers make their appearance. He brings suit, and then, to his surprise, discovers that the invention is a very old one and the patent utterly worthless. The Patent Office is far from being reliable in its grants. The only safe way, where interests of value are at stake, is to have careful searches made by competent attorneys as to the validity of the patent.

The same remarks apply in respect to the scope of patent claims. The purchaser is too apt to suppose, in buying a patent, that the claim is broader than it is, and covers the manufacture of an article so as to exclude all competitors. He therefore goes extensively into the business, exhausting money and energy, only to find out, what an attorney's examination would have quickly revealed before hand, that the scope of the patent claim is very narrow, and the patent of little value.

CONCERNING A TELESCOPE OF UNLIMITED POWER.

In volume I, number 3, of the *Mathematical Monthly*, for 1858, may be found an article written by Professor George R. Perkins, then of Utica, N. Y. It relates to a fluid parabolic mirror; and the problem is demonstrated that "if an open vertical cylinder, containing a fluid, be made to revolve with a uniform motion about its axis, the upper surface of the fluid will assume a perfect concave parabolic form." A table is appended which gives the focal distances corresponding to different velocities of rotation; and these have been deduced from actual mathematical calculation.

If mercury be used as the fluid, we shall obtain a concave parabolic mirror which will be theoretically perfect. We think it possible to make use of this kind of mirror for astronomical purposes; for all rays of light falling upon it parallel to its axis will be reflected to the focus of the parabola, where could be applied the ordinary magnifying apparatus, after the method employed in the Newtonian reflecting telescope.

Now it is necessary to reduce our theory to practice. The cylinder containing the mercury must revolve with a uniform motion; and it is our opinion that the mechanics of the present day are fully adequate to the construction of machinery which shall impart a uniform motion to a vessel of mercury many feet in diameter. This problem of uniform motion has been successfully solved: the astronomical instrument known as the chronograph is made to move almost perfectly uniformly; and the heavy clockwork which is employed in moving large refracting telescopes, in a direction contrary to the diurnal rotation of the earth, is often so perfect that a star, from its rising to its setting, can be kept almost exactly in the center of the field of view. Now certainly, since we have attained so perfect a uniformity of motion as this, machinery can be devised and constructed which shall impart the required uniform motion to an immense vessel of mercury. It is evident that gravity would not permit this mirror to be inclined for the purpose of viewing objects which are not directly overhead; and since this is true, it is also evident that the value of the mirror of mercury would be somewhat lessened by reason of the fact that a celestial object would soon pass off the field of view of a stationary mirror. So that we must devise some method by which the rays of light from any part of the visible heavens may be thrown vertically upon the mercurial surface. For the accomplishment of this object, the principle of the philosophical instrument well known as the heliostat could be employed, and thus the rays of light coming from any heavenly body could be continually reflected vertically upon the mercurial surface.

As to some of the manifest advantages which this instrument would possess: The liquid mirror would not be distorted by a change of temperature; thereby being far superior to reflecting telescopes with solid mirrors. Again, there is no limit to the size of mirrors constructed in this way; and this fact will allow the use of eye pieces which will afford unlimited telescopic power. The speculum surface, also, of mercury is almost perfect, absorbing a much smaller amount of light than the polished surface of the metal used in ordinary reflectors. And the specific gravity of mercury is such that, after it has once assumed its position of equilibrium in rotation, it will be quite stable in its form. It will also be readily perceived that the principal thing about the mercurial telescope is its machinery; which can be much more easily and accurately constructed than the great lenses necessary for an immense refractor.

Now this plan for the construction of a large telescope certainly possesses advantages sufficiently great to warrant the expense of all experiments for testing its practicability. The essential thing in the execution of a large telescope consists in the requisite funds. The million dollar telescope, so earnestly talked about by some of the correspondents of the SCIENTIFIC AMERICAN for several months past, calls for a considerable sum of money; the mercurial telescope, offering far greater power, calls for a far less sum of money. And again, the entire lifetime of an optician would be barely sufficient for grinding and polishing and correcting a pair of lenses large enough for a million dollar refracting telescope; whereas an immense mercurial telescope might be constructed inside of two years; indeed it might be easily completed before the Centennial of 1876, at Philadelphia, if it is desired that it be used on that occasion. Such an instrument would add indefinitely to our knowledge of physical astronomy; and, moreover, the great amount of light which a large mercurial mirror would collect, even from exceedingly faint celestial objects, would be particularly favorable for spectroscopic observation.

This method seems, at present, to be our last resort for