Scientific American.

ESTABLISHED 1845.

MUNN & CO., - - - EDITORS AND PROPRIETORS.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, - - NEW YORK.

TERMS TO SUBSCRIBERS.

One copy, one year, for the United States, Canada, or Mexico $3.00
One copy, one year, to any foreign country, postage prepaid, £0 16s. 5d. 4.00

THE SCIENTIFIC AMERICAN PUBLICATIONS.

Scientific American (Established 1845).....$3.00 a year.
Scientific American Supplement (Established 1876) ..... 5.00 "
Scientific American Building Edition (Established 1885). ..... 2.50 "
Scientific American Export Edition (Established 1878)..... 3.00 "

The combined subscription rates and rates to foreign countries will be furnished upon application.
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MUNN & CO., 361 Broadway, corner Franklin Street, New York.

NEW YORK, SATURDAY, MARCH 18, 1899.

SELECTION OF THE NEW CANAL COMMISSION.

Now that Congress has decided that the question of a canal at the Isthmus must be investigated in the most thorough manner, and in the broadest possible spirit, the selection of the board of engineers becomes a matter requiring the exercise of careful judgment. The fact that the people of the United States should demand yet another survey in spite of the fact that eight or nine previous surveys have been made simply proves that they realize the magnitude of the undertaking, and do not wish to be driven by mere sentiment or impulse into a venture of which the physical merits and demerits and financial liabilities are only imperfectly known.

In comparing the several surveys that have been made, there is one disquieting fact which, perhaps, more than any other, has led Congress to pause before committing itself to the construction of the canal, and this is the wide disparity which appears in the estimates of the practicability and cost of the various proposed canals, and particularly of that at Nicaragua. Between the estimate of $65,084,176 by Menocal and the estimate of $150,000,000 by General Hains there is a disparity so great as to satisfy Congress that at the present stage the surveys are in no such condition as to warrant it in taking up the work of construction, or even sufficient to allow an intelligent comparison to be instituted between this and the apparently more feasible Panama route.

The authorization of yet another survey, and the placing of the large sum of $1,000,000 in the President's hands for the purpose, show that it is the wish of the country that this examination shall be thorough, impartial, and final. It is desirable that the new board should be composed of engineers who have never yet been employed in previous surveys, with a view to obtaining an expression of opinion from as many different experts as possible and enabling the final report to be compared as to its findings with those of previous commissions.

Having these facts in view, we think that the reappointment of the Walker board, which, it is stated, is under consideration by the Executive, would be decidedly at variance with the spirit and purpose of Congress indemanding yet another survey. In the first place, it would narrow down the investigation to a few men who have already given their views upon the subject, and have shown a strong bias toward one canal as against the other; and in the second place, there is every evidence that the members of this board are already widely at variance in their views upon the cost of the Nicaragua scheme itself.

The country has asked for a new survey, not for a rehash of an old one; and in view of the fact that one member of the board, Prof. Haupt, has said in committee, "After my investigations as to the economies that would be effected by this (the Nicaraguan) canal the question of cost does not carry very much weight in my mind, even if it were $200,000,000," we think the desirability of securing entirely fresh material on the new board is evident.

Bearing in mind that the threefold interests, military, naval, and commercial, are interested, we think that the appointment of a board consisting of three engineers from the army, two from the navy and two from civil life, none of whom has been concerned in the previous surveys, would best meet the needs of the case and comply with the wishes of the whole nation.

As matters now stand, four out of the five members suggested for the new board have served on the old commissions, and three of them are committed to the construction of the Nicaragua Canal. Of what value will the report of such a commission be in solving the problem of the best available route when its members are already notoriously pledged to one particular route? If the President is desirous of fulfilling the clearly expressed wish of Congress, he will appoint an entirely non-partisan commission, or one which includes a commissioner representing officially the interests of each canal. How comes it that in selecting a board whose avowed object is to examine the relative merits of Panama and Nicaragua, the new board has been filled with partisans of Nicaragua, while those of Panama have been ignored altogether? Has the Executive any doubt of the fitness of General Abbott, U. S. A., one of the most experienced engineers in the world, or of Chief Engineer Fteley, under whose care the great Croton undertaking is being successfully completed? We sincerely hope that the admirable judgment which has hitherto characterized the actions of the Executive will not be clouded at this late hour by such obvious partiality as is shown in the proposed make-up of the new commission.

TO PREVENT CROWDING ON STREET CARS.

There are some things in which New York city leads the world, and one of these is the art of overcrowding. There are residence areas of the city in which more souls are to be counted to the square mile than in any other quarter of the globe; there are thoroughfares down which a more solid stream of humanity surges at certain hours of the day than can be witnessed in any city of the old or new world, while in the matter of transportation we have developed overcrowding into a fine art. There is certainly no city that can touch us in this last respect; for by virtue of that skill which comes only by patient study and long, if painful, experience, the average New Yorker in a crowd is an adept in adjusting the irregularities of his body to conform with as little discomfort as possible to those of his neighbor. As a result we lead the world in our ability to jam a maximum number of people into a minimum amount of car-space.

We are certainly a most patient people. Discomforts of travel which would render the average Briton apoplectic with indignation, or call forth from a Frenchman the choicest expletives of his expressive language, are accepted by ninety-nine out of a hundred Americans as irremediable and therefore inevitable. Occasionally some returned tourist, fresh from the "seat for all" methods of Paris or London, ventures to ask why some restrictive methods are not taken to prevent our street and elevated cars from carrying more passengers than they can seat; but he is immediately met by the statement that Americans are too busy a people to wait for a seat, and prefer to travel standing if they can not start at once.

The fallacy of this reply is obvious to anyone who has seen both systems at work; for while it may happen that occasionally in the cities named a passenger has to wait a few minutes for a vehicle with a vacant seat, in the vast majority of cases the first car or bus that comes is available. This fact is explained by the great law of supply and demand, the various transportation companies placing more cars upon the routes as fast as they are required. If the authorities of Paris, deciding to return to the barbarism and brutalities of overcrowding, rescinded the law insuring every passenger a seat, half the cars would be withdrawn at once from the city's streets. If, again, the resultant miseries were found to be unbearable, and the law was re-enacted, the number of vehicles would be at once increased by the necessary amount.

So with New York. If legislative means were taken to prevent overcrowding, the street and elevated railway companies would find means to increase their carrying capacity until practically every passenger was supplied with a seat. If they were unable to do this, the underground would be built at once; for the people have to be moved twice daily from one end of our long and narrow city to the other, and if it is found that it cannot be done with decency by the existing lines of travel, others will have to be provided.

The Metropolitan Street Railway Company could exactly double the capacity of its system by the simple expedient of double-decking its cars, a change that could be carried out within a few months' time on its most important and overcrowded lines, such as Broadway, Lexington Avenue, and Madison Avenue. The most serious cause of delay would be the raising of the elevated structure some four or five feet at the few points where the Metropolitan tracks on these lines pass beneath those of the elevated—a change that could be made at an insignificant cost, compared with the vast relief afforded to the traveling public.

By directing long distance passengers to take the upper deck of the cars and reserving the lower deck for "short haul," the delay of loading and unloading passengers would be greatly reduced, the passageways being free and the passengers being able to move without delay from their seats to the platform. This change could be made within a few months on the lines in question, and within twelve months the raising of the elevated structure on Third, Sixth, and Eighth Avenues, at the points where at present it would not admit double-deck cars beneath it, could be completed and the cars running.

It would be a costly undertaking for the roads concerned, but not nearly so costly as the franchises granted to these roads by the city are valuable and deserving of every possible return in the way of provision for the comfort of the traveling public.

The Harburger bill, at present before the Assembly, provides that the cars shall carry no more than they can seat, and that when all the seats are occupied the entrance gates shall be closed. Such a procedure is impracticable and too radical, and it would prove disastrous if put rigorously into practice. During the rush hours, with the present number of cars in use, many of the downtown passengers would have to wait from a half to a full hour before they could get the coveted seat. At the same time we think that some less drastic measure in the way of a "no seat, no fare," or "no seat, half fare," enactment would hasten the introduction of the two-deck car or the construction of the underground road. Certainly the two-deck car should be given a thorough trial. It is in practical use in a number of European cities and gives very general satisfaction.

THE FARMER AND THE PATENT SYSTEM.

Until recently that numerous and influential class of our citizens, the farmers, have in some sections of the country borne a feeling of enmity toward the patent system. There is no doubt that this feeling arises from an entire misunderstanding on the part of this intelligent class of our citizens as to the aims and purposes of the patent laws, and that this feeling of hostility has been engendered and increased by the unscrupulous acts of certain parties who have taken advantage of the protection of the patent laws to levy a species of blackmail upon the unsuspecting farmer. It will be interesting to review some of the benefits that the farmer has derived from the patent system.

The average farmer now lives nearly as well as did the most prosperous of his class in the old colonial days, so far as the necessities are concerned; and, as for luxuries, he has no end of conveniences and pleasures that were not to be had at any price in those days. But, as his prosperity depends on his earnings, let us compare the fruits of a given amount of labor expended in agriculture then and now.

Taking first the plow, which is one of the most important, if not the most important agricultural implement, at the time of the enactment of the first patent law in this country, in 1791, the plow was a wooden structure shod with iron, and it was so imperfect that but an acre of land could be plowed in a day, and even then it was not much more than scratched. The plow had hardly been improved at all in forty centuries. Now, the steel plow, with its greater strength and its perfected shape, digs down and overturns the soil so that a much larger crop is grown, and several times as much work can be done in a day with the ordinary one-horse plow as with the old form; while a steam-driven gang glow can plow twenty acres in the same length of time.

The harrow of the eighteenth century was simply a log having the spurs of its limbs for teeth. It was ineffective and easily broken. The modern harrow is mounted on wheels, and its well-shaped steel teeth are yieldingly supported, so that they may spring aside, instead of being broken on striking a stone. It does thirty times as much work in a given time as did its predecessor, and, besides this, it carries its driver.

The planting of seed in rows and the cultivation of the plants that grew therefrom before the advent of the American inventor were done with the hoe. Now the seed, with a measured amount of fertilizer, is accurately deposited and covered as rapidly as horses can walk; and implements which were never dreamed of by our ancestors thoroughly cultivate by horse power the ground between the rows.

Of machinery for digging vegetables and harvesting corn, grain, and other crops, there is now such a variety that one is embarrassed to describe it, and yet it was all unknown one hundred years ago. The best implement for harvesting grain three generations ago was the cradle. This is a scythe having wooden fingers parallel to and above the blade to catch the grain as it was cut, so that it could be laid straight on the ground for ease in gathering it. A single man using a modern self-binding harvester will cut and bind twenty times as much grain in a day as he could cut alone with a cradle. These machines are sold for about the same price as a high-grade bicycle.

In thrashing by the use of the flail, which many persons living can remember to have seen in common use, four men could thrash twenty bushels of wheat in a day; while the steam thrasher of to-day, using the same number of hands, can thrash one thousand bushels in an equal length of time. In fact, there are steam-propelled harvesting machines on the Pacific slope that cut a swath twenty-six feet wide through a field of wheat, and the same machine at the same time thrashes, cleans, and puts the grain into bags at the rate of three bushels per minute; yet seven are all the men that are needed to run such a machine.

The prototype of the mower is the scythe, which has a comparative efficiency of one to twenty; and one modern horse rake is equal to half a dozen field hands working with the hand rake, which was the best implement the last century afforded.

The baling press is entirely an invention of this century, and yet, without it, hay could be profitably raised only near enough to the cities to be hauled in wagons, for it could not be shipped by railroad economically in its loose state.

In fact, there is so much machinery in use by the farm-

er of to-day for doing work that was done largely by hand before the advent of the patent system that this article would be altogether too long if all of even the principal instances were mentioned. While the farmer of the Revolution did most of his work by the unaided use of his hands, the farmer of the present time works by his brain through machinery which he has only to guide and to watch and most of which saves him the trouble even of walking.

This substitution of machinery for hand labor on the farm has relieved the farmer of other burdens than the mere drudgery. The use of hand labor before the patent system compelled the employment of a large force of laborers. Our comparatively short seasons required that the greater part of the force should be gathered in the spring and discharged in the fall to save wages through the long winter. It was with difficulty that men could be found at the desired time, and those of entirely unknown antecedents were gladly hired. This force was idle at intervals and again it required a considerable temporary increase. These men had to be housed and fed, necessitating the employment of female help, which is at all times difficult to secure in the country.

On the other hand, the introduction of farm machinery increased the power of a man to work to about ten times what it had been with hand tools, resulting in a great reduction in the number of hands necessary to operate a farm, and eliminating to a large extent the inconveniences of the larger force. Farm machinery is soon paid for out of the saving in wages and board which results from its use, and the cost of production is thus so greatly lowered that the American farmer is enabled to compete with low-priced hand labor in other parts of the world, while his profits at the same time are much increased.

The case is parallel to that of the shoemaker and the shoe manufacturer. The shoemaker can profitably make expensive shoes to suit fastidious customers, but he cannot compete with the almost equally good machine-made shoes of the manufacturer in supplying the masses. No profits in general agriculture can be made where intelligent American hand-labor is relied upon to the exclusion of machinery. It has been the experience of trades repeatedly that, so long as there is no way to produce an article but by hand, cheap foreign labor supplies our own market; but as soon as we begin to make it by machinery we not only drive out the imported hand-made production, but sell abroad at a lower price than that for which the manually produced article can be offered. In this country, the wages of hand-labor more than eat up the profits. It is only in gardening that such labor can be economically employed by the agriculturist. To make general agriculture lucrative by hand-labor, it is necessary to go where Chinese, negroes and laborers of similar races may be utilized.

We cannot stop with the farm machinery, however, in enumerating the inventions produced since the patent system was introduced which benefit the farmer. When grain is hauled to the railroad, it is deposited in the cars or in the storage bins of the warehouse by a single movement of a lever; and at the great elevators of the large cities an entire train of cars will be loaded or unloaded in a single hour, thus doing in a small part of the time the work of an army of the shovelers of former days.

The modern mills make better flour and make it at a fraction of the cost of the last century; so that, as it is cheaper as well as better, a much enlarged demand is created for the grain from which it is made.

The dairy and canning machinery now in use not only replace an enormous amount of manual labor, but, by quickly converting the perishable milk into cheese and butter and by preserving the fruit and vegetables, they render profitable the raising of these products without reference to the distance from the cities. This was not formerly possible, because such forms of produce as these would spoil while being hauled to the market in wagons. The same advantages have accrued from the slaughtering machinery and refrigerator and stock cars with reference to the raising of live stock for meat.

Modern methods of refining oil and improved lamps have produced a light that is many times more brilliant than the old tallow dip of our forefathers and that is almost as safe.

The railroad is of the greatest service to the farmer, and here, too, the patent system is most intimately connected with its institution and development. The railroad ships live cattle and perishable fruits and vegetables from distances that would be impossible with the old methods of transportation, because such products would perish on the way, and, besides carrying more stable products, it brings the farmer his implements and fertilizers. In fact, if he had to haul all of his products by wagon, many large areas in this country could not be worked, because they are so far from the markets that the cost of shipment in the old way would be prohibitive. The railroad puts the farmer in touch with the consumer, no matter what distance may separate them. Indeed, the railroad and steel steamship open to the American farmer the whole world as a market. The steel steamer is much more economical than the wooden sailing vessel which it has supplanted, because it is several times larger, much safer, and faster than the sailing ship, and yet it requires a smaller crew and a shorter period of time to make a trip, resulting in a great saving of wages. The farmer gets the benefit of these differences in lower transportation.

Another invention which was developed under the fostering care of the patent system is the telegraph. By its use the farmer is often notified of the failure or probable failure of crops in other parts of the globe in time for him to supply the deficiency. Through the telegraph he is warned of storms which would destroy his herds in time to take them to shelter—a proceeding that requires many hours on the great stock farms of the West—and of frosts, so that he may protect his small fruit. The telegraph, by giving frequent reports of the supply and demand, serves to keep the prices of the farmer's merchandise uniform throughout the entire country, excepting for the cost of transportation. He also knows the daily fluctuations of prices in the markets, so that he may choose the most advantageous time to sell.

These instances of the economy resulting from the use of machinery show that the resources of the farmer of the nineteenth century, compared with the meager earnings of his eighteenth century ancestor, are, to a great extent, due to the machinery which is at his command and which his forefathers did not have.

That this machinery has ever been invented is largely due to our wise patent laws, which will be apparent from the following considerations: The machinery which the farmer now enjoys did not exist before the patent system, but has been devised almost wholly since its establishment. Those who drafted the Constitution, with that foresight that has so many times evoked admiration when viewed in the light of after events, included a clause which was intended to produce just this result. The farmers of no other country are one-half so well provided with labor-saving machinery, and no other country has had, or now has, a patent system equal to ours.

The farmer labored for many centuries without machinery, and the patent system was instituted for the purpose (among others) of supplying him with machinery. Almost immediately after the enactment of our patent laws, agricultural machinery began to be invented and improved, and as this progress has continued and has steadily increased, it is clear that the patent system is the cause of the existence of the farmer's machinery and, through it, of his affluence.

Most of these inventions would not have been made if it had not been for the protection of the patent laws. To bring an invention from the general idea in the inventor's mind to the practical, durable, salable form often requires the expenditure of years of effort and thousands of dollars before any returns are had; so that it is safe to say that very few would expend their energies and resources if it were not for the inducements offered by our patent system.

Congress concluded that the most equitable manner of rewarding the inventor was to give him a monopoly for a limited time of the manufacture, use, and sale of his invention. This monopoly induces him to labor untiringly to create an invention, to put it in the most practical form, and to introduce it as thoroughly as possible in order that he may get the largest possible amount of profit. If the invention is of little practical value, its sales will be small, while from an invention of great utility the inventor may, and probably will, reap large profits; but this is only for a limited time, after which the invention will become public property. The reward is thus in just proportion to the benefit which the public derives from the invention.

The manufacturer of farm implements, on whose head the resentment of the farmer is sometimes showered because of the supposed larger prices of the agricultural machines covered by existing patents, would be glad to be relieved from the danger of strikes to the extent to which the farmer has been emancipated by the machinery furnished by the patent system; for, if the farms of to-day, which are many times larger than those of the last century, were operated with the hand implements of those days, the labor problem would become as serious to the farmer as it is to-day to the manufacturer.

Seeing, therefore, how absolutely necessary is the patent system to the welfare of the farmer and to the country at large, he should instruct his representatives that the patent system is to receive their earnest support, and that time spent in so changing the patent laws and their operation as to give the strongest practical incentive to the inventor which is compatible with the greatest ultimate advantage to the public will be appreciated as highly as any other efforts he can possibly make.

EDWIN J. PRINDLE,
Assistant Examiner, United States Patent Office.

ABOUT thirteen years ago the first tank steamer was built, and there are now one hundred and eighty tank vessels in existence, nearly all of them being steamers. Their tonnage is 401,024.

DEATH OF JOHN KRUESI.

John Kruesi, the chief mechanical engineer of the General Electric Company, and one of the little band of men who worked with Mr. Thomas A. Edison at Menlo Park, N. J., died at Schenectady, N. Y., on February 25, 1899. He was born in 1843 in Switzerland, and went to work in a machine shop at an early date. He came to the United States in 1870 and was engaged by the Singer Sewing Machine Company. In 1872 he entered the employ of Mr. Edison and became associated with him when he later, in 1875, opened a shop for purely experimental work in Greene Street, New York. Mr. Kruesi became Edison's machine foreman, designing and making special apparatus to fit the conditions. From 1876 to 1881 Mr. Edison was busy with the phonograph, the telephone, incandescent electric lighting, electrical railway experiments, etc. The first phonograph ever constructed was made by Mr. Kruesi from Mr. Edison's rough sketch, and this instrument is now in the Patent Department of South Kensington Museum, at London. Mr. Kruesi made the machine and brought it to Mr. Edison, who set it going and spoke into it the now familiar "Mary Had a Little Lamb." When it started to repeat his words, he was almost awed when the machine actually repeated the rhyme in clear words, when at the best a hoarse murmur was expected. Mr. Kruesi remained with Mr. Edison and became one of his partners and assisted in laying out the conduits for incandescent lighting in New York city. Mr. Kruesi occupied important positions in various of the Edison companies and he was of great assistance in building the Schenectady shops; in fact, as they now stand, they are Mr. Kruesi's monument. He had charge of the Schenectedy works from 1892 until 1896, when he was appointed chief mechanical engineer of the company.

DEATH OF LIEUT. DASHIELL.

Lieut. Robert B. Dashiell, Assistant Naval Constructor, United States Navy, who has been for some years in the Bureau of Construction and Repair at Washington, D. C., died at his residence in Washington, March 8, at the age of thirty-eight years. Lieut. Dashiell was a native of Maryland, and was appointed a naval cadet in 1882. His record at the academy was one of the most brilliant in the history of the institution, and the promise which he gave for success in future life was more than fulfilled by his subsequent achievements. Lieut. Dashiell devoted himself to ordnance, and he soon became recognized as one of the brightest men in the service. We have already illustrated some of the important inventions of Lieut. Dashiell, such as the "Dashiell" breech mechanism, his gun mounts, and his ammunition hoist. His exceptional ability was recognized in his selection, while still an ensign, to install the plant at the Indian Head Proving Ground. Here he became exposed to all conditions of weather, and contracted malaria, from which he never fully recovered, and which was the real cause of his death. After completing his work at Indian Head, Lieut. Dashiell was transferred to the construction corps, and here, as elsewhere, he soon became an authority. He devoted himself to the study of dock construction and spent two years in Europe. The report he made has been adopted by the department as the basis for dock construction under his direction. The service has suffered a severe blow in the death of Lieut. Dashiell.

SPORTSMEN'S EXHIBITION.

The fifth annual exhibition of the Sportsmen's Association was formally opened at the Madison Square Garden on Thursday, March 2. The whole Fourth Avenue end of the building was occupied by a drop scene representing a Canadian glacier, which formed an appropriate background. The Indian village at the foot of the glacier added to the realistic effect, which was greatly enhanced by the big game which occupied a large portion of the floor space. Real Indians gathered around the camp fire and seemed to be thoroughlyat home. The large central space was taken up by exhibits of various kinds, animals in cages, and the swimming tank, in which aquatic performances were given, including sensational high dives. Various displays occupied the space ordinarily taken up by boxes and arena seats. Here were exhibited guns, ammunition, animals' heads, skins, camping outfits, etc. Several railroads had miniature camps and guides. The live specimens of game were particularly interesting. Two handsome moose and a couple of buffalo were very much admired. From a scientific point of view, various launches and launch engines were the most interesting objects on exhibition.

NAVAL BUREAU CHIEFS.

Under the provisions of the new naval personnel law, the bureau chiefs of the Navy Department, who have heretofore been entitled only to the relative rank and pay of commodores, will have the rank and pay of rear-admirals of the second class, corresponding in grade and pay to brigadier-generals of the army. Chief Constructor Hichborn celebrated his advancement and his sixtieth birthday together.