

THE NICARAGUA CANAL.

At a time when the promoters of the Nicaragua Canal bill are urging the government to assume the financial responsibility of the undertaking by guaranteeing the principal and interest of the bonds of a private company to the amount of \$100,000,000, there are one or two cardinal facts which need to be kept prominently in the public eye, particularly as there seems to be a disposition on the part of the promoters of the bill to keep these facts conveniently out of the discussion.

We have always been favorable to the Nicaraguan Canal as such, and there is no public journal that would be more gratified than our own if it could be proved that the canal can be built for a sum of money upon which the prospective traffic would pay a reasonable rate of interest. But, as the matter now stands, this is a vital question upon which everybody is in the dark, and nobody more so than the engineers themselves.

It is now about four years ago that a previous effort was made to secure a government guarantee of the bonds. Some doubts were expressed at the time as to the estimated cost of construction; and the absence of any accurate information on this head led to the rejection of the bill and the appointment of a board of experts to make an independent examination for the government. Three engineers of high standing, respectively in the army, the navy, and in civil practice, made an examination on the ground of the proposed route of the canal. They made as complete an investigation as the funds at their disposal would permit, and their report stated that the estimates of the canal company's engineers would have to be raised from \$69,893,660 to \$133,472,893, or practically doubled.

It was evident that the government experts considered the estimates of the canal company's engineers to have been based upon a too rapid and superficial survey of the route and that the data was too incomplete to give them any reliable value. As an instance of the discrepancy between the figures of the two estimates, it may be mentioned that the maximum flood discharge of the river near the Ochoa dam was estimated at 42,000 cubic feet per second by the company's engineers and at 150,000 cubic feet by the government experts. The great Ochoa dam, in some respects an unprecedented undertaking, was estimated by the company to cost \$977,000 and by the board of engineers to cost \$4,000,000! These are only two instances out of a lengthy report which proved that, as the affairs of the canal then stood, any legislation by the government would have been simply a leap in the dark. The report concluded with a recommendation that the sum of \$350,000 be appropriated for an exhaustive examination, which should extend over eighteen months, or long enough to enable a reliable estimate of the rainfall to be obtained.

Now it is obvious that the next natural thing to do would have been to have the sum voted and the expert commission sent out. The high character of the engineers was a guarantee of the sincerity of the report, and it stood there, as it stands to-day, an insuperable barrier to any flotation of bonds for construction of the work. If the aims of the canal company were to build a great engineering work that should be a benefit to commerce and a profitable investment for capital, they should at once have pressed for the execution of such a survey as the expert board recommended. There was nothing to lose and everything to gain by a bona fide investigation of what the canal company presented as a bona fide scheme. Provision for the survey could readily have been secured, and by this time reliable data would have been available.

Instead of following this very obvious course, the canal company has done everything in its power to throw discredit upon the report of the professional men who were sent out to safeguard the interests of the nation, and the promoters of the bill have ignored the report altogether. They are now seeking to push through the bill in its original form, with its enormous guarantee of \$100,000,000 of bonds for the construction of a work which nobody knows very much about.

Why this haste? If the canal scheme is a good one it will bear investigation, and if the nation is to be virtually committed to its construction, it surely has a right to know the cost. This it does not know, and, as the experts have shown, has no means of knowing at present; and the action of the promoters of the bill in trying to shut out investigation is likely to prove the most effective agent in bringing about its defeat. There is no doubt but what the course pursued by the company and its representatives is discrediting the whole scheme in the eyes of the nation. Charges are being freely made that a complete examination is what the parties who have charge of the enterprise are most anxious to avoid. If this conviction should once become general, the scheme will receive a setback from which it may take many years to recover.

We are fully alive to the sentimental reasons for the construction of the canal with American capital, and for its being subject to American control. But no amount of sentiment can alter the fact that there is a right way

and a wrong way to bring this about. If the canal is practical, by all means let it be built; but let it be done according to everyday business principles, and not in direct violation of them. It is not too late for the friends of the canal to secure an appropriation for that careful survey and estimate which is the necessary precursor of all great engineering works. When the survey has been made and the report presented, the nation will be able to consider intelligently the question of government support or control.

A RAPID TRANSIT TUNNEL BETWEEN NEW YORK AND BROOKLYN.

A deep tunnel scheme for rapid transit between New York and Brooklyn is recommended by a commission which was appointed by the mayor of the latter city to arrange a plan for improving rapid transit facilities on certain of its streets. The plan proposed contemplates an electric line (partly in tunnel and partly on an elevated structure) from Cortlandt Street and Church Street, New York, to Ralph Avenue, Brooklyn.

It is proposed to have a low level station at Cortlandt Street, New York, about 70 feet below ground, connecting with the streets and the elevated roads in that city by means of elevators, the tunnels being carried thence to a station at Maiden Lane and Pearl Street, with connections with the Second and Third Avenue railways; thence under the East River and under Pineapple Street and Fulton Street to a station near the City Hall, Brooklyn; from thence under Fulton Street and Flatbush Avenue to the Flatbush Avenue station, where it would be about 18 feet below grade. The tunnel will be carried under the Brooklyn streets within the curb lines to a station at the City Hall, where it will be 115 feet below the street grade, and will rise by an easy grade from that point, so that the bottom of the tunnel shall come above the main relief sewer at Flatbush Avenue and Hanson Place before passing into the depressed station.

Continuing from Flatbush Avenue station, along Atlantic Avenue, the tracks are depressed to Bedford Avenue, a distance of 6,700 feet, the depression being covered by means of girders and masonry arching, restoring the surface of the street for public use for its full width. From the east side of Bedford Avenue the railway tracks will rise rapidly in an open cut to the grade of the street, and, continuing to rise, will pass onto an elevated railway structure, which, at Nostrand Avenue, will attain such height that full head room will be provided for all street traffic without interference.

The physical characteristics of the ground between Bedford and Nostrand Avenues are such that the rising grade of the railway and the falling grade of the street combine to favor this transition from a depressed to an elevated structure, so that no obstruction is caused to any existing cross street, and full advantage is taken of the length of this block between Bedford and Nostrand Avenues (which is the longest on Atlantic Avenue). At Nostrand Avenue an elevated station is proposed, and the elevated structure continues thence a distance of 8,010 feet to Ralph Avenue.

The project is a modified form of the plans prepared some four years ago by the Long Island Railway Company, who thereby sought to secure a New York terminal for their system. We understand that the company is disposed to work in harmony with the commission, and such a connection will be in line with their efforts to secure entry into New York by other tunnel schemes, and notably by the proposed Blackwell's Island bridge.

The construction and operation of deep tunnel electric roads such as this has long ago passed the experimental stage. They can be built at a reasonable cost, and their construction does not involve any problems of engineering that are not well within the control of modern skill and resources. The success of the existing tunnels of this kind in London has shown that there is no popular objection to subterranean travel. If the proposed New York and Brooklyn tunnel is built, its extension to the Jersey side to connect with the Pennsylvania system would merely be a question of time.

SCHEMES FOR CHECKING RETURNED NEWSPAPERS.

The Tribune has examined carefully the different devices which have been submitted, at least one hundred in number, for indicating whether a newspaper has been sold and read. They all show great ingenuity, and many of the Tribune's friends have spent much time and thought over the subject. To all of them this office extends its most sincere thanks. Owing to the peculiar construction of a modern web printing press, the majority of the plans submitted are inapplicable without actually building a new press to utilize the invention; and the enormous expense of a printing press puts that out of the question. In the construction of a new press they could be applied, if thought best, however.

Speaking broadly, the devices suggested fall into four groups:

First—Twenty or more correspondents have proposed the fastening of adjoining leaves or the whole

paper at the edges with a wire staple, rivet or other metal attachment. Some of these schemes are practicable, although special machinery would have to be built to make use of the idea. They would all require the tearing out of a part of the paper during the reading.

Second—Others have suggested the pasting of a gummed label or seal over the leaves of the paper. This again is practicable to a certain extent, particularly in presses which run at a slow speed. In a rapid press it is doubtful whether the idea could be utilized. And as for pasting together the whole edges of two adjoining leaves, one might as well let the paper remain uncut altogether; that would be the most perfect of sealing and canceling devices; but enormous sums have been expended by all the great dailies simply and solely to be able to send their papers to their readers with the edges cut. No backward step can be taken in that regard.

Third—The punching of a hole in the margin of the paper has been proposed by so large a number of men and women that one marvels at the fact. All sorts of holes are suggested, the majority of them in artistic forms. The idea of the proponents is that two things will happen. First, if a paper is read, as it is, by all members of a family, it will be so crumpled that if any one attempts to fold it in its original form the edges of the punched-out hole will not thereafter correspond, which will indicate the facts of the case. Second, that the paper which is punched out and left hanging, like a tongue, will be torn off in reading, and the absence of the tongues of paper will tell the story. There is something in this idea, but its value can only be revealed by actual experiment. So far, the experiments of the Tribune have been inconclusive.

Fourth—Many have proposed the pasting together of the leaves of the paper in two or three places. In reading, the paper must be torn apart where pasted, because no one could read the interior pages unless he did so. This is a practical device, and the one easiest of application. It has the disadvantage of tearing the margin of the papers, the disfigurement being greater or less, according to the haste with which the finger is thrust in and the leaves torn apart.

Two or three men have suggested one other idea, namely, the use of invisible ink, but there are various reasons why such a method would not be in the least conclusive. Some of the plans proposed are patentable; and if the one best way could be found and could be patented, the inventor would be able to derive an excellent revenue from it.—Tribune.

OUR NEW TORPEDO BOATS.

Torpedo boat No. 6, which has just been completed by the Herreshoffs, was sent on a preliminary trial run by her builders on January 20, when she made a speed of 26.85 knots. The result was very gratifying to the firm, considering the circumstances of the trial; for the run was made with an untrained crew in the engine room and under reduced boiler pressure. The contract calls for a speed of 27½ knots under 220 pounds of steam, and as the little craft was carrying only 180 pounds to the square inch, it was confidently believed that under the favorable conditions of a trial trip 28 knots an hour will be realized. The water was fairly smooth, the breeze blowing across the course, which was a part of that which has been laid out for the official trial.

The expectations based upon this performance were realized in another builders' trial, on February 5, during which, in a series of eight runs over the measured mile course in Narragansett Bay, she averaged 28.76 knots an hour. Her highest speed was 30.1 knots, and every mile was run off at a higher speed than the contract calls for, viz., 27½ knots. The steam pressure ranged from 205 to 225 pounds to the square inch, the latter being the maximum allowed.

THE MODERN VERSION OF SUPPLY AND DEMAND.

Prof. Thurston, in the pages of Science, discredits the generally received idea that increased demand implies increased prices, and that an increased supply causes lower prices. This is not the case. It may be the case momentarily, but, in the long run, "increased demand and an enlarged market, by permitting more economical operation of the system of production, decrease prices." He instances the copper production of the Lake Superior mine. In operation for years, it has been in competition with such mines as the Calumet and Hecla, and has yielded almost uniform profits all the time. The cost of production has been reduced to one-half what it was a generation ago, and the value of labor has been correspondingly reduced per ton of product, and the market price of labor has gone up. In the open market, the price of a commodity is practically the cost of production plus a fair business profit. If this result is not obtained, a business languishes or expires. If profits are abnormally large, capital is attracted and competition set up, and the availability of capital now brings about the modern fact that increased demand causes reduced prices.