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(Illustrated articles are marked with an asterisk.)

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Table listing sections I through VIII, including Engineering and Mechanics, Technology, Art and Architecture, Physics, Biology, etc., with page numbers.

CYLINDRICAL NUTS.

The substitution of cylindrical nuts for those of a square or a hexagonal form has been advocated, with very good reasons as a backing. Recently an opportunity was given to see a practical illustration. A machinist had an order for a small ornamental steam engine, to be placed in the show window of a coffee and spice establishment, and on it he used cylindrical nuts instead of hexagonal ones.

The method of making the nuts produced them in a very rapid manner. A bar of steel, of the proper diameter to finish to size after being turned, was fed through the head of a turret lathe, the end squared, a hole drilled in it, the tap run in, the surface turned, and the nut cut off; all done by fixed tools in the turret and the cross cutting-off tool.

In addition to these advantages of quick work, almost self-acting, the rapid production of the nuts and their finish from the first inception, there is the advantage of the requirement of less metal for the requisite strength.

Another advantage that the cylindrical nut has over the angular nut is that the wrench may get a grip in moving through the smallest arc of a circle; an advantage that will be understood by the setters-up of machinery under difficulties.

RAILWAY IMPROVEMENTS NEEDED.

The recent disaster near St. Catherines, Ontario, where a heavy passenger train drawn by two locomotives went through a swing bridge into the canal, brings to mind the fact that a similar accident occurred at the same place eleven years ago.

There are appliances that will, if kept in working order, effectually prevent such accidents. It is true that accidents do happen occasionally on roads that are equipped with the most approved means of safety, but this is chargeable to the neglect of those who have the care of the appliances, rather than to any inherent defect.

brakes to operate. This is the fifth train that has met destruction on this side of the Atlantic within two years from failure of air brakes, and accidents less serious are frequent from the same cause.

Air brakes are usually placed under the care of skillful mechanics, whose business is to give them thorough inspection and all needed repairs at the end and before the commencement of each trip, but notwithstanding these precautions they sometimes refuse to act, and the results are usually serious.

AS TO THE SINKING OF THE WIRES.

The time given to the electrical companies in New York city to present plans and come to an agreement as to the system to be adopted in burying the wires has now gone by, and, according to the law passed by the last legislature, they must accept the plan chosen by the Electrical Subway Commission.

Unhappily for the New York companies, the commission contains neither an electrician nor a scientific expert, and however good their judgment maybe, it is scarcely probable that they will be able to discover a means of efficiently working long lines of telephone, at least, underground, when a score of experts employed by the companies have failed in a similar search.

It is pretty evident, too, by recent action of some of the companies, that the constitutionality of the law is to be thoroughly tested before they succumb; the Commission in the mean time being enjoined from interference.

Having once had authority to string the wires through the streets, and there having been no proviso to restrain them at any moment from further operation of aerial lines, they cannot be constitutionally forced to change the mode of operation without compensation. The right of the legislature to forbid any further stringing of wires, save what is required to keep the original lines in efficient working, is admitted.

SHOP INDEPENDENCE.

Unless one has an "independent fortune," one making him independent of financial circumstances, there is no condition in civilized life preferable to that of a shop mechanic. Especially is this the fact if the mechanic is competent and feels an interest in his work.

There are others who do not. An illustration is recent. A fine workman, a machinist, possessing other valuable qualifications as an executive manager, a public speaker, and with great personal power of persuasion, was induced to take the superintendency and management of a Young Men's Christian Association.

Recently he was seen, and asked if the change from a public life to a shop life was agreeable. He was quite enthusiastic in his praise of shop life; he was independent; had no meddling suggestors to bother him; could scan his day's work in the morning, and see it done in the evening; was nobody's slave or servitor; did not have to modify his plans to suit a committee; his eight