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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

THE "CASUALTY LIST" OF AMERICAN INDUSTRIES.

Statistics are "dry"; but sometimes they are wonderfully illuminating, and occasionally, by means of a tabulated list, a fact will be brought home to the public with a convincing force, which could be gained in no other way. At the dinner held in New York to inaugurate the opening in this city of the First International Exposition of Safety Devices and Industrial Hygiene, Gov. Hughes made the startling announcement that the number of people killed or wounded in the various industries of the United States, amounts to 500,000 every year! And yet, if we bear in mind what a large number of people fall victims annually to the carelessness with which our railroads are operated, it should not surprise us that in the whole range of our industrial activity the total number of accidents should reach the stupendous figure of half a million.

It is characteristic of the shortsightedness, the absence of perspective, the lack of a sense of proportion, which marks the average individual, that there should be such a wild outcry against the slaughter of a great war—an event which may occur once in ten years—when, as a matter of fact the killings and woundings of battle are insignificant compared to the day-by-day carnage and mutilation which occur in the prosecution of the so-called peaceful arts.

And this tragedy is rendered all the more terrible when we learn that by the outlay of a certain amount of money and the expenditure of a reasonable amount of well-timed forethought and protective provision, most of our industrial accidents could be absolutely prevented.

That the subject has never excited its proper amount of shame and pity, is due to the fact that the accidents are scattered throughout the year and spread over a territory as wide as the United States. The killing of a few industrial workers in Seattle will arouse local pity and indignation in the State of Washington; but it will be read with only a passing glance in the daily dispatches of a Florida newspaper. Yet if all the accidents of the year should take place on one particular day and in one particular city, say in New York, and if, on the first of January of each year, we should learn that, on the day preceding, half a million people had been killed or wounded in this city in the pursuit of their peaceful avocations, we would then realize the full horror of the situation.

As is usual in matters affecting the safety of life and limb of the individual citizen, we in the United States are, in respect of this matter of preventing industrial accidents, far behind European nations. It is in the endeavor to educate the public to an appreciation of the gravity of the situation and show them how much can be done, and is being done elsewhere, to safeguard the industrial classes, that the present International Exposition is being held in the Museum of Natural History in this city, where a wide variety of appliances for the protection of the artisan are being exhibited. Many, if not the majority of the devices, consist of comparatively inexpensive attachments for preventing contact of the operative with the more dangerous parts of the machine. Of such kind are the shields which cover swiftly-revolving emery wheels, to catch the flying fragments in case the wheels should burst under the high speed at which they are run; the casings built around the gears and pulleys of lathes and other geared machines, with which accidents have been so shockingly frequent in the past; and safety shields and stops which, while they do not prevent the operative from properly observing the action of the machine, render it absolutely impossible for the hands to be caught and maimed by the moving parts.

The fact that such lavish sums are given in this country for charitable purposes proves that our large industrial casualty list is not due to lack of kindliness of heart. It is rather to be explained by the fact that we are in a general way too careless of life and limb, and that, for the lack of properly advertised statistics on the subject, we have never realized how widespread and pitiful is this tragedy of our modern industrial life. Prevention is ever better than cure, and the promoters of the present exposition of safety devices are inaugurating one of the most commendable philanthropic works in the history of the country. To a certain extent the evil can be remedied by legislation; but a quicker remedy can be found in the voluntary adoption on the part of our industrial concerns of those inexpensive means by which our annual casualty list would be immediately reduced.

SATISFACTORY FOUNDATIONS FOR PANAMA DAMS AND LOCKS.

In view of the attack which is being made in more than one quarter against the selection of the Gatun location for the construction of a dam and locks of unprecedented size, it is gratifying to learn from the report of the Isthmian Canal Commission in relation to the new borings of the Gatun dam that the latest investigation shows the foundation both for the dam and for the locks to be satisfactory. The report states that one hundred and twenty-seven holes have been bored at Gatun lock site, covering an area of 1,200 by 5,000 feet. All were carried well below the lock walls, and sixty-six to a depth of fifty feet or more below sea level; and they all show that lock walls will rest on firm and suitable soft rock. Thirty-six borings made, covering an area of controlling gates for spillway, all show safe foundation in soft rock. Three lines of borings, sixty-three in number, all extending to rock, have been made across Valley Chagres, covering the dam site. Pervious material is found in only four holes, and these below the 200-foot level. Ten borings have been made below the foundations of the Pedro Miguel lock walls, all showing rock suitable for foundations. Test pits at Gatun and Pedro Miguel so far all show harder material than cores from borings.

The investigation which the commission has continued has thus far led to no disclosure of extraordinary difficulties, requiring changes of previous plans. The continuation of surveys has for its object the complete adaptation of the design of locks and other features of the plan to the existing surface and subsurface conditions. There is nothing in the later examinations made affecting the practicability or permanence of the Gatun dam.

The borings show below the surface soil what is termed "indurated clay" or "chopped sand and clay." The chopped material is, however, different from the indurated clay and "seems to be a sort of hardpan or conglomerate, either of which will make a good foundation." "The borings and exposures of the material in the French work at the drydock at Cristobal establish" that the indurated clay "makes an entirely satisfactory foundation for the proposed lock structures."

Mr. Stevens, the chief engineer of the canal, states that besides indurated clay, there is what is called blue clay and sand, clay, gravel and fine sand, etc. This is not so hard as the indurated clay, but is in every respect an equally good and sufficient foundation for locks, etc. Mr. Stevens believes that this material is "as good as the indurated clay and good enough in any case" to form a satisfactory foundation.

THE PANAMA CANAL CONTRACT.

The two most important events that have happened in connection with the construction of the Panama Canal since the recent visit of President Roosevelt to the Isthmus, have been the opening of the bids for the construction of the canal and the recent presentation of the report of the Isthmian Canal Commission in relation to the new borings which have been made along the site of the Gatun dam and locks. The most surprising fact developed at the opening of the bids was the wide disparity between the percentages for which the contractors offered to do the work. It will be remembered that under the terms of the contract the present plant of the government will be taken over by the contractor, who will act practically as the agent of the government, and that the contract is to be given to the firm which offers to do the whole work at the smallest percentage of the estimated cost of the canal, always presupposing that the contractors are otherwise satisfactory to the government. The bidders offered to do the work for a percentage which varied from 6.75 to as high as 28 per cent of the total cost. The remarkably low bid of 6.75 per cent was made by a firm of which the junior member is not considered to be acceptable to the government, and, as matters now stand, the senior partner is seeking to associate with him one or more individuals or firms that will meet the government requirements. At the same time, in a statement recently issued from the White House, the public is informed that the President is highly gratified with the rapid progress which is being made under existing conditions, about half a million cubic yards having been taken out of the Culebra cut during the past month, while the amount of excavation is steadily increasing.

It is evident that the government is even at this late day considering the construction of the canal under its own supervision by the engineers of the United States army, as an alternative to its being built by contractors under the present chief engineer of the commission. We have always felt, and do still strongly believe, that contract construction will be found to be the most speedy and economical, in spite of the fact that an amount equal to at least 6.75 per cent of the cost of the canal must be paid to the contractor. The advantage of contract construction is shown in the statement from the White House above referred to when it says: "The real object in contracting the work is to have assembled a large number of the best specialists in each class of work." It is this advantage which has led to the placing of all great engineering works, whether for State or municipal improvement, or the extension and improvement of railroads, with responsible contracting firms. There is every reason to believe that the economies in time and cost usually secured in carrying through these great works will be also secured if the same policy is followed at Panama. There is no reason why the considerations which render it expedient for New York city to build its $160,000,000 water supply system by contract should not hold good for the construction of the $140,000,000 canal at the Isthmus. We do not advocate construction by contract because of any doubt of the ability of the army engineers to handle the work successfully; for we doubt if, anywhere in the world, there is to be found a body of men so well qualified by technical training and wide experience as this fine body of professional men. It is through no fault of theirs that work done by the government is, or at least is popularly supposed to be, usually more expensive than work done by contractors under the supervision of civilian engineers.

SHOULD THE STEEL MAKERS SUBSIDIZE OUR SHIPBUILDERS?

There is much good sense in the suggestion made by Mr. Alexander R. Smith, in a recent pamphlet on American shipping, that the powerful corporations engaged in the manufacture of steel and iron should combine for the purpose of offering for a fixed period a substantial bounty for the construction in the United States of ships built of American steel. It is suggested that such action should be taken simultaneously with the passage by the government of the Merchant Marine Commission's Shipping Bill, or of some other measure of equal effectiveness; and the author believes that upon the passage of such a measure by Congress, coincidently with the announcement of such a bounty to be paid by the steel concerns on steel ships built in this country, the rapidity of the increase of our foreign-going tonnage would be immediate, and so great in its proportions as to practically create a new industry.

The suggestion is not by any means novel or untried. For many years German syndicates have paid large bounties on exports of manufactures, with such success that the policy has recently been discontinued, only because it had operated so successfully as to be no longer necessary for the encouragement of the manufacturer or the advancement of trade. If our American steel concerns should take the initiative, and announce the institution of a system of bounties, it is believed that such a step would stimulate Congress to pass the pending shipping bill.

The considerations upon which the above suggestion is made are that in the United States there are probably half a dozen steel-manufacturing corporations whose aggregate capital exceeds $2,000,000,000, and whose net earnings probably now exceed $200,000,000 annually. During the fiscal year ending June 30, 1906, the value of our exports of iron and steel was over $160,000,000, and it is admitted that in many cases the articles of export were sold at a reduction considerably below the prices obtained for the same articles in the United States. This, it is claimed, is tantamount to a bounty paid by the producers of those articles for the purpose of securing and holding a foreign trade regarded as of value and benefit to such producers. It is considered that the amount of that bounty, or lower price, is considerably in excess of the bonus of from $3,000,000 to $5,000,000 a year, which it is suggested should be offered for a period of ten years by a combination of the steel and iron manufacturers. Such a bonus, based upon the tonnage of steel ships built in the United States for our foreign trade, would establish an industry in the United States which might conceivably raise our merchant marine to that leading position which it held in the middle of the last century.

WHY THE BIG ONE-CALIBER-GUN BATTLESHIPS ARE BEST.

In a letter recently written by President Roosevelt to the chairman of the House Committee on Naval Affairs, advocating the construction of two 20,000-ton battleships of the "Dreadnought" type, the President presents a powerful and convincing argument in favor of big ships, and offers much valuable information upon a greatly misunderstood question. The facts and arguments of his letter are based upon a masterly discussion of the subject in a recent report by Lieutenant-