A prominent weekly magazine recently started a page on new inventions. I do not know who edited it. Its literary style was good but some of the statements made very humorous reading for an engineer.

In view of all this, I believe the Cleveland plan is an excellent one. Accurate, impartial statements about engineering projects, simply written and, if necessary, trimmed and embellished by the editor so as to have the right sound, can do much to benefit the profession and to educate the public.

C. H. BENJAMIN.

Dean of Schools of Engineering, Purdue University, Lafayette, Ind., Jan. 31, 1914.

Mr. Wegmann's Relation to the Stony River Dam

Sir—In your issue of Jan. 22, 1914, you published an article by G. H. Bayles, M. Am. Soc. C. E., describing the construction of the Stony River Dam, in West Virginia. On another page of the same issue there appears an account of the failure of about 75 ft. of this dam. As Mr. Bayles' article gives my name as "Consulting Engineer" in connection with this work, permit me to say that my services consisted only in advising the West Virginia Pulp & Paper Co. what kind of a dam to build and in preparing the contract and specifications.

The site selected for this dam on Stony River, West Virginia, was on top of a mountain, about 3000 ft. above the sea. The construction of a solid masonry dam was out of question, as it would have cost about $500,000. There was no suitable material for an earth dam near-by, and so the choice of dam was restricted to some type of hollow reinforced-concrete dam.

Four construction companies were invited to submit designs and bids for building such a dam (see ENGINEERING NEWS, Sept. 5, 1912). Only one of these companies, viz., the Ambursen Hydraulic Construction Co., of Boston, Mass., had had extensive experience in building such dams. About 70 Ambursen dams had been constructed in various parts of this country and Canada and no failures had occurred.

The West Virginia Pulp & Paper Co. paid the Ambursen Co. a liberal fee for designing the dam and for any patent rights which it might own. As the bid of this company for constructing the dam was too high, the contract was awarded to Fred G. Webber, of New York, who was to receive a lump sum for building the dam according to the plans of the Ambursen Co. and an additional payment per cubic yard for excavation and masonry where the engineers ordered the cutoff wall built deeper than shown on the plans. This was left for the engineer of the paper company to decide according to developments. To insure that the work would be well executed, the paper company engaged one of the engineers of the Ambursen Co. to be constantly on the ground during the construction, in addition to its own resident engineer.

My connection with the work ceased before the contract was signed, which occurred before the plans prepared by the Ambursen Co. had been received. I made only one visit to the site of the dam. This visit was preliminary to my recommendations. The paper company did not request me to make any further visits. I did not see the site after construction began.

From what has been stated above, it will be seen that the West Virginia Pulp & Paper Co. did everything in its power to have the Stony River Dam properly designed and built.

EDWARD WEGMANN.

New York, Feb. 7, 1914.

NOTES AND QUERIES

On page 262 of our issue, Jan. 29, in the report of the annual meeting of the American Society of Civil Engineers, in the 13th line from the bottom of the second column, it is stated, "Mr. Hovey and others spoke against the motion. . . ." This is an error and should have read, "H. W. Hodge and others . . . ."

A correspondent who is in immediate necessity of answering the problem is anxious to know the effect of sauerkraut on concrete.

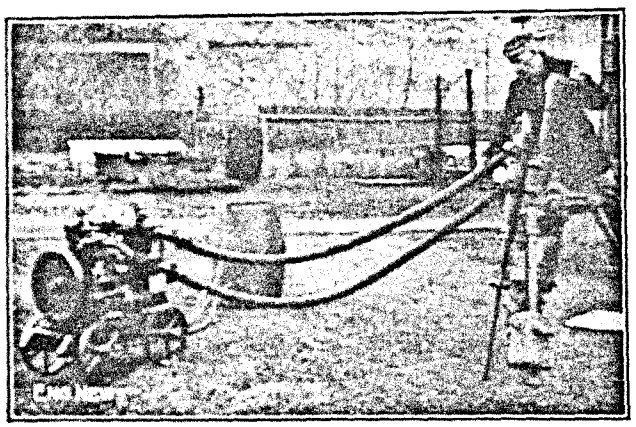
Electric Traction Plans of the Chicago, Milwaukee & St. Paul for its Mountain Division in Montana have been advanced over the announcements made in "Engineering News," Jan. 16, and Dec. 25, 1913, so that the following details are available. There will be at first twelve 200-ton freight locomotives, four 200-ton express passenger locomotives and two 100-ton local passenger locomotives with a few electric switchers. On the first two types, the equipment will be arranged for regenerative braking to return to the line some 50% of the energy required in up-grade hauls. The through-passenger locomotive is designed to pull a ten-car, 1000-ton passenger train at 24 miles per hr. on a 2% grade. The local-passenger locomotive will be able to haul a 300-ton train at 42 miles an hour on level. The scheme of heating the passenger cars has not been decided on. If the passenger locomotives are built for running from one end only, there will be space for a small heating boiler, but if double-end control of these locomotives is finally adopted individual car heaters will have to be used after the practice on the neighboring Butte, Anaconda & Pacific Ry., which operates by a similar systetm. The freight locomotives are designed to haul a trailing load of 2500 tons on a 1% grade at a speed of 15 miles per hr., one locomotive being used on grades up to 1% and two between that and 2%, maintaining the same speed.

An overhead catenary-type trolley will be supplied from five substations. The contract with the Great Falls Power Co. provides for delivering energy at seven points along the wider limits of the ultimate electric zone, but these do not all coincide with the proposed substations. Therefore, there will be a continuous transmission line following the right-of-way, except for cut-offs at sharp curves. Single-pole bracket suspension will be used generally for the contact wire. The poles will be of wood, guyed at curves. For spans of two to four tracks and for sharpest curves cross-catenary supports will be thrown across between wood poles. For span of more than four tracks, the span wire will run between steel poles. The clearance between conductor and rail will be 24 ft. The track will be bonded and in addition a No. 0000 return feeder will be used, carried on top of the trolley poles, serving also as a ground wire for lightning protection.

The substation capacities have been arranged to provide energy so that locomotives may be started at full effort on grades, accelerating at the rate of 0.15 mile per hour per second. To this end, where the line has a gradient greater than 1% (in three places) the substations will have three 1500-kw. motor-generator sets, one being a reserve. For grades less than 1%, the substations will house two such units, one in reserve. Each motor convertor will comprise a 60-cycle synchronous motor direct-connected to two 750-kw. 1200-volt direct-current generators in series for the 2400-volt service. Three single-phase step-down transformers are to be interposed between the motor-generator and the 100,000-volt line. Each set will have its own exciter. Starting under maximum load and grade will impose 100% overload on two converter units, and these will be built to operate at 200% overload for five minutes. In emergency the locomotive can be operated with its motors in series so that they will start at low speed and half demand. It is reported that the contract provides a peak-capacity supply of 20,000 kw. at present and a 60% load factor. To limit peak loads the train dispatcher will also control the power load by regulating train speeds, delaying trains at the foot of grades and dispatching at favorable hours.

A Gasoline-Engine-Driven Air Rock Drill*

A type of drill has been in use for some eight years, comprising a pulsating compressor and drill engine working in a closed system. As first brought out, the pulsator was driven by an electric motor (see ENGINEERING NEWS, July 26, 1906); a modification has now been designed in which the motor is replaced by a 6-h.p. single-cylinder gasoline engine.



GASOLINE-ENGINE AIR ROCK-DRILL OUTFIT

As shown in the accompanying figure, the engine fuel-supply tank and pulsator are all mounted on a four-wheel truck for easy transportation, making the device best adapted for locations where electric power is not possible or advantageous. The fuel consumption is reported to be about 2 qt. of gasoline per hour; the supply tank, surmounting the engine holds 1¼ gal. The main bearings have grease cups and the piston and crankpin are splash oiled. Circulating water for the engine jacket is obtained as may be most convenient.

The drill is of simple type—having a cylinder and drill-rotating device but no valves, springs, side rods, etc. The cylinder is larger than in the corresponding air drill, but the piston is shorter so that the weight of a drilling unit is about the same. Air from the pulsator (a double-acting valveless compressor) comes alternately above and below the piston, there being two short hose connections. This air is never exhausted but plays back and forth between drill and pulsator. This last machine has no water jackets and is driven through gearing.

Length of stroke is varied by cranking the drill closer to or farther from the work. The drill will operate under the smallest clearance between drill point and rock, since there are no valves dependent for throw on piston travel. The cushioning at each end of a stroke is such that the piston strikes neither head. The drill can be backed out of bad rock while running; unlike the ordinary drill, when the steel sticks, the pulsations on the piston tend to loosen it.

The drill cylinder is 4¾ in. in diameter, and the stroke is 7 in. Octagon steels are accommodated from 1 to 1⅛ in. diameter, and for holes up to 12 ft. deep. The feed is 24 in. and the number of strokes 440 per minute. The machine shown is built by the Ingersoll-Rand Co. of New York City.

*From information furnished by the Ingersoll-Rand Co., 11 Broadway, New York City.

A $20,000,000 Chinese Flood and Famine Prevention Project

The large flood and famine prevention works in the Huai River Valley, China, recommended by Charles Davidson Jameson, American Red Cross Engineer to China, after careful study, are to be carried out by the J. G. White Engineering Corporation, 43 Exchange Place, New York City, in case the Chinese government, with the aid of the corporation named, is able to dispose of $20,000,000 of bonds to finance the project. The bonds have been authorized by the Chinese Government, to be expended under the general direction of the American Red Cross, and the latter has designated the corporation named as engineering, construction and financial agent for the execution of the work.

A long abstract of Mr. Jameson's report on this problem, accompanied by a map of the flood and famine district, and a number of halftone views, was published in our issue of Sept. 25, 1913. Mr. Jameson advised permanent flood-prevention works in place of the temporary works on which the Chinese government has spent large sums yearly—without preventing famines which have resulted in the philanthropists of the world pouring millions of dollars into China to afford partial relief. The area involved is 17,000 square miles, on which "the farmers do not average more than two crops in five years, where, if the floods were eliminated, the normal condition would be two large crops each year."

The following information regarding the present status of the project is taken from a statement just issued by the J. G. White Engineering Corporation:

> The whole enterprise depends upon the ability of the Chinese Government to find a market for the proposed bond issue. It is anticipated that there will be no difficulty in this connection, and the prospect is that American money, as well as American engineers, will be largely involved.
>
> Dr. Chen Chin-Tao is now on his way to America to represent his country in the negotiations, and five distinguished engineers will be assigned to confer with the J. G. White Engineering Corporation and Dr. Chen Chin-Tao, and proceed to China, in time to observe the next overflow of the Huai River, which generally occurs in July.
>
> The work will require approximately six years to complete, and employment will be given to about 100,000 men. The project will involve dredging to deepen the channel of the river and the Grand Canal; also the construction of dams and reservoirs to keep the Huai in its proper course, and to impound its surplus water and divert the streams flowing into the Huai, which, at the time of floods, greatly increase its overflow. The Huai River, for the greater part of its length, flows between banks that are elevated above the surrounding country, and in times past the river in overflowing its banks, has changed the geography of an entire Province over night. During one of the flood periods, the Yellow River, which is a tributary to the Huai, switched the location of its mouth a distance of about 700 miles.
>
> It is the plan of the Chinese Government to pay the principal and interest of the proposed $20,000,000 bond issue, from taxes to be levied on the lands that will be benefited in the flood district, and also from rentals and the sale of about one million acres of land, which will be reclaimed.

The outcome of this great project will be watched with interest by engineers throughout the world.

An Engineering Competition is advertised in "London Engineering" by the Chilian government, covering complete designs and estimates for the main model workshop and four auxiliary repair shops of the Chilian State Railways. A first prize of $20,000 is offered for the best scheme with a second prize of $10,000 and several honorable mentions. Plans are to be delivered to the Ministry of Railways, Santiago de Chili, before May 1, 1914. A Special Commission will examine them and award the prizes.