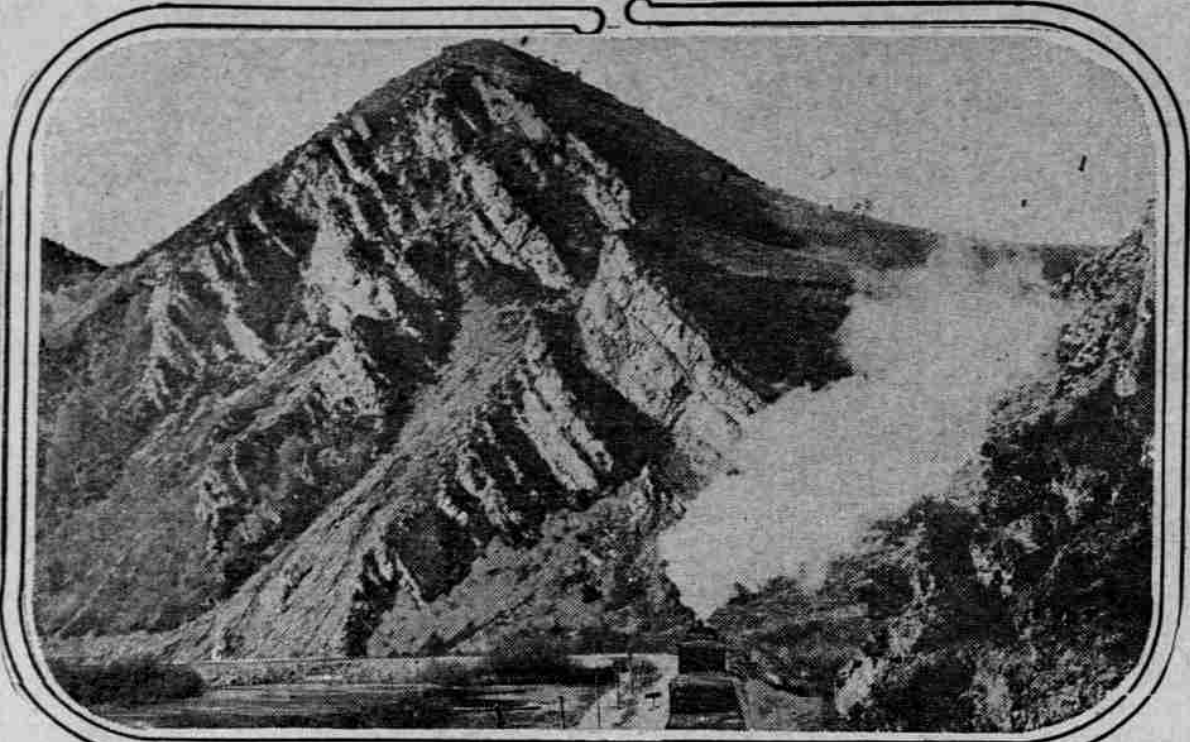
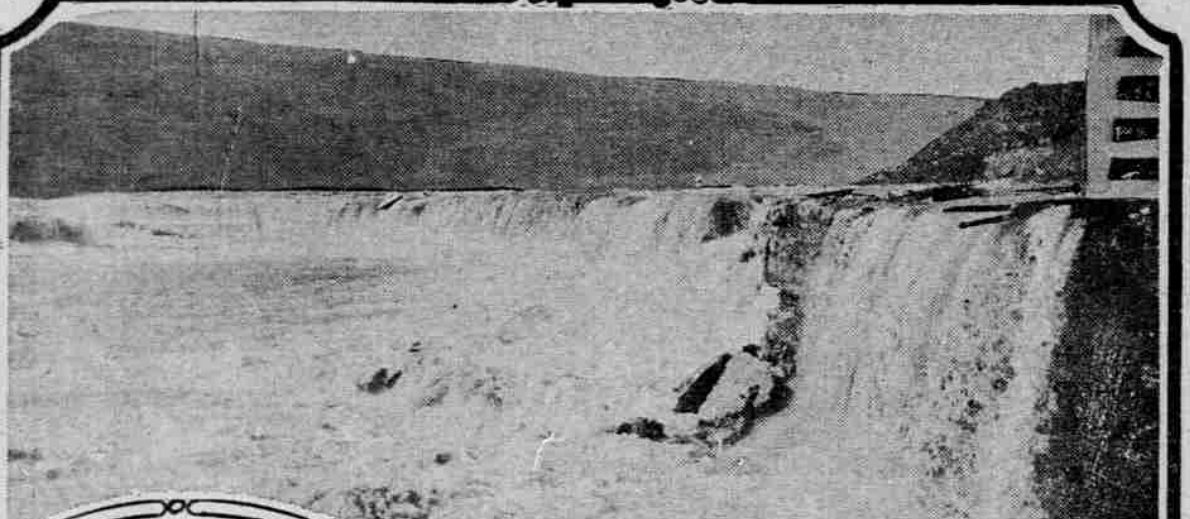


# CHICAGO, MILWAUKEE & ST. PAUL TO ELECTRIFY 113 MILES OF ROAD

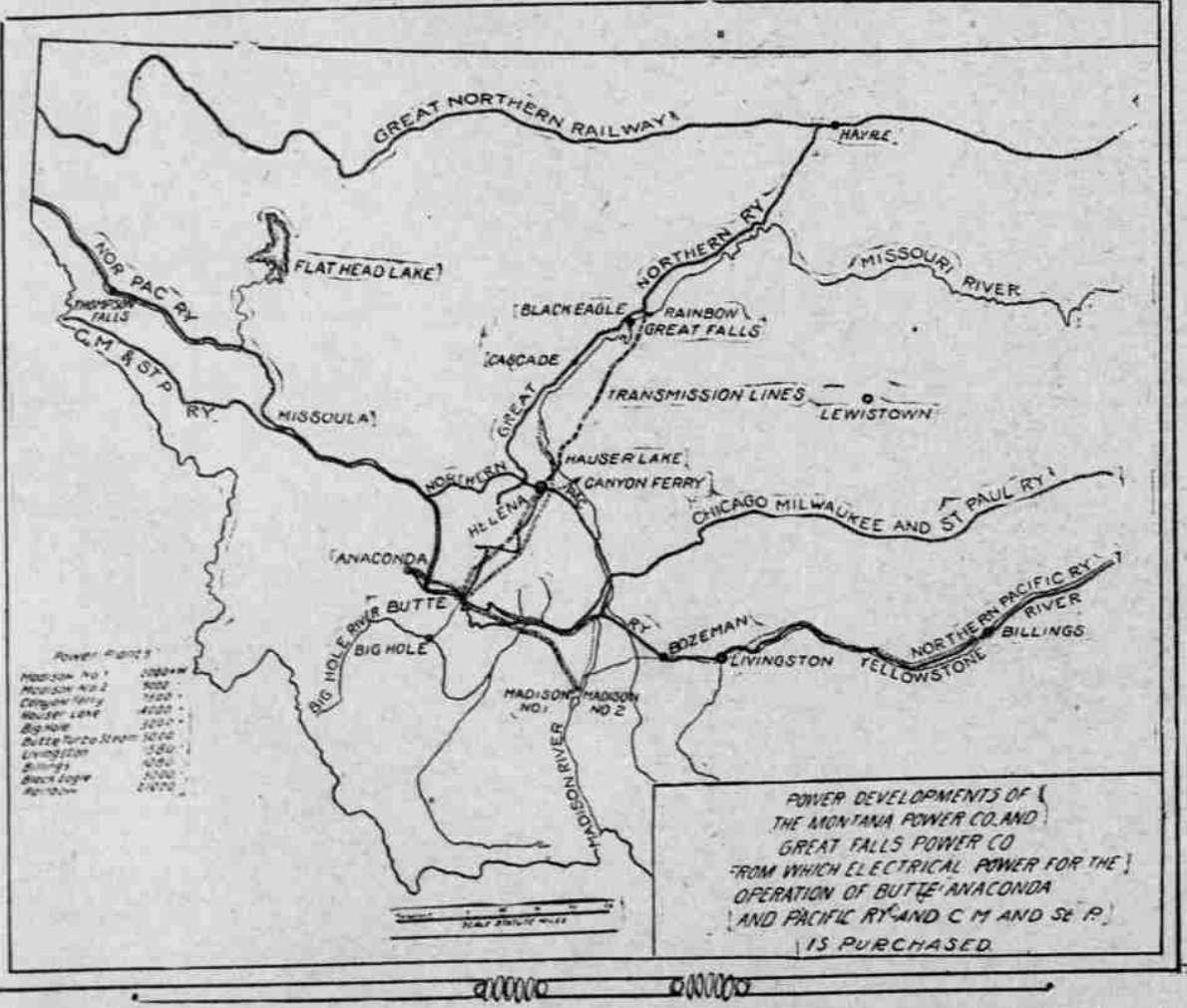
Plans Are Complete for Gigantic Task to Cost \$15,000,000 and Require Three Years' Labor—Idaho and Montana Rivers to Supply Power—First Stretch to be from Deer Lodge to Twin Forks.



Where C.M. & St. Paul Skirts a Towering Mountain in Jefferson Valley Between Three Forks and Piedmont



Where C.M. & St. Paul Skirts a Towering Mountain in Jefferson Valley Between Three Forks and Piedmont



trified, as the ultimate project includes the electrification of four divisions, extending from Harlowtown, Montana, on the east, through Three Forks and Deer Lodge to Avery, Idaho, on the west, a total main line distance of 440 route miles aggregating approximately 650 miles of track, including grades and sidings. It is planned to electrify the remaining divisions between Harlowtown and Three Forks and between Deer Lodge and Avery. The entire project is to be completed in 1918.

**Electrification Greatest Yet.**  
All this work involves the expenditure of \$13,000,000 to \$15,000,000, and the electrical construction work will proceed at the rate of about \$2,000,000 annually. This programme foreshadows the electrification of the entire road from Harlowtown to the Pacific Coast, a main-line distance in the aggregate of 350 miles.

This will be the most extensive railway electrification in the world and the first to employ as high a potential as 3000 volts direct current. The most powerful locomotives ever built will be operated on this track. It will be the first main-line transcontinental mountain grade electrification, and the first undertaking where entire engine districts are comprehended. Contracts

**SUMMARY OF CHICAGO, MILWAUKEE & ST. PAUL ELECTRIFICATION.**

The total cost will be \$15,000,000. Three years of labor are involved. This is the first step toward the electrification of 650 miles of track, including grades and sidings. The new locomotives will be more powerful than any steam or electric locomotive ever built. It will be the most extensive railway electrification in the world. It will be the first main line transcontinental mountain-grade electrification. It is the first undertaking of its kind where entire steam divisions are included. This road will be the first one to use direct current at a potential of 3000 volts. The electric locomotives will not have to stop for coal, water, cleaning fires or waiting for steam, insuring regularity of service and higher average of speed. The entire installation is expected to show a large saving in operation cost as compared with steam.

have been signed with the General Electric Company, of Schenectady, N. Y., for the electric locomotives, substation apparatus and the line material. The electrification of this road is undertaken purely on economic grounds with the expectation that superior operating results with electric locomotives will effect a sufficient reduction in the present cost of steam operation to return an attractive percentage on the large investment required. If the expected savings are realized in the electric operation of the road this initial installation will constitute one of the most important milestones in electric railway progress, and it should lead to large developments in heavy steam road electrification.

**Economy Prompts Step.**  
There can be little doubt but that the electrification of the Chicago, Milwaukee & St. Paul was favorably influenced by the wonderful saving on the Butte, Anaconda & Pacific electrified division when electricity took the place of steam about a year ago. The total cost of the Butte, Anaconda & Pacific electrification, including a change of signal system on Smelter Hill, interest during construction and all incidentals was in round numbers \$1,501,000. The savings from 20 steam locomotives is not included in these figures. To say nothing of the increased capacity of the lines, the improvement in the service, etc., the savings are as shown in the following table:

	Steam 1913.	Electric 1914.	P.C. 1914.
Fuel and power...	\$115,252.74	\$104,568.71	47.81
Depreciation...	224,890.00	224,890.00	0.00
Engine-men's wages...	104,461.18	71,225.28	31.81
Engine-hse exp...	23,007.50	18,238.38	23.38
Water...	4,305.00	1,198.70	27.90
Lubricants...	9,151.44	4,942.82	49.30
Electric supplies...	5,823.02	4,522.36	21.33
Total locomotive performance...	284,921.24	257,539.42	29.92
Treatment of water...	147,632.30	116,486.00	21.30
Grand total...	\$742,553.34	\$473,825.42	36.19

This table shows that the railroad in question has been able to operate 25.6 per cent less trains and get a 35 per cent greater tonnage per train, with a 27.5 per cent saving in time required per trip. Originally, the estimate on which the decision to proceed with this electrification was made placed the expected annual net saving at 17.5 per cent of the cost, so that the financial results here have been quite as satisfactory as the general performance of the equipment.

**Three Mountains Crossed.**  
Between Harlowtown and Avery the Chicago, Milwaukee & St. Paul crosses three mountain ranges, all within territory known as the Great Continental Divide. The maximum grade westbound is 2 per cent for 20.8 miles on the eastern approach of the Rocky Mountains, and the maximum grade eastbound is 1.7 per cent for 24 miles approaching the St. Paul pass tunnel through the Blitter Root Mountains. Between the ranges there are many miles of 0.3 to 0.6 per cent grades. The hardest problem, however, is considered to be presented by the continuous grade of nearly 1 per cent for 40 miles ascending the western slope of the Belt Mountains. The electric locomotives will be constructed to pull freight trains of 2500 tons up this grade at 15 miles an hour, the heavier grades being negotiated with a pusher locomotive as at present. The necessity for operating the motors at maximum continuous capacity for the long distance is a condition which has not been encountered heretofore in work of this nature, and is significant of a most important advance in electrification engineering.

**Power Carried Far.**  
The Chicago, Milwaukee & St. Paul will receive its electrical energy from the Montana Power Company for the entire 440 miles of main line electrification. This power company covers a large portion of Montana and Idaho with a network of transmission lines which collect electrical energy from the following water power developments:

	Kilowatts.
Madison River	11,000
Chamberlain	7,500
Hauser Lake	5,000
Big Hole	3,000
Butte (steam turbine)	2,000
Rainbow Falls	2,000
Small power sources aggregating	7,350
Total	68,800

Additional power will be obtained from the following developments, part of which are under construction:

	Kilowatts.
Great Falls	82,000
Holler	25,000
Thompson Falls	30,000
Snake River	20,000
Missoula River	10,000
Total	177,000

The total capacity developed and undeveloped is 244,800 kilowatts, or about 325,000 horsepower.

# MEN PROMINENT IN PUBLIC LIFE ARE SNAPPED BY PHOTOGRAPHER

James Gordon Bennett, Owner of New York Herald, Sails for Paris Despite War—Carlton Betts Arrested on Charge 20 Years Old—England Sends Delegate to Vatican.



**James Bowron**  
NEW YORK, Jan. 16.—(Special.)—James Gordon Bennett, the well-known proprietor of the New York Herald, and a sportsman of note, recently has sailed for Paris, despite the war. He has been enjoying a brief visit to the United States. He was "snapped" by newspaper photographers while he was enjoying a promenade on Fifth avenue.

Carlton Betts, known in Chicago as Carlton Hudson, has been arrested for the New York authorities on a charge of forgery 20 years old. He has been living in comparative luxury in Chicago under the name of Carlton Hudson. Recently he was accused by an elderly woman of swindling her of her entire fortune.

Dr. J. Whitridge Williams, as head of the American Association for the Study and Prevention of Infant Mortality, presided at the recent convention of the association in Boston. The delegates held a number of clinics and visited several hospitals in study. Milk stations were also up for inspection. The possibility of public schools for study to reduce infant mortality came up at the convention and received indorsement.

Fred C. Howe recently has been appointed Surveyor of the Port of New York and has entered upon his duties with a thoroughness that promises to make his charge productive of results in due time. Mr. Howe is recognized among his associates as a student of thoroughness and system. He has had a wide experience as an executive.

James Bowron, president of the Gulf States Steel Company, of Birmingham, Ala., engaged in a conference with James A. Farrell, of the United States Steel Company, at the recent meeting of the Iron and Steel Institute at Birmingham, which was attended by steel men from all over the United States.

Dr. John Henry McCracken has been made president of Lafayette College at Easton, Pa. He is the son of Chancellor Emeritus MacCracken, of New York University. He was graduated from New York University in 1884. He afterward spent some years in graduate study at the New York University, and at Union Theological Seminary and was ordained. He studied also at Westminster College, Mo., and after four years there became professor of politics at New York University.

Sir Horace Plunkett, the well-known Irish authority on agriculture, has arrived in America on a visit. He came on the Baltic. Sir Horace is a frequent visitor to the United States to look after business interests. He is as much at home in New York as in London or Dublin. Sir Horace was engaged for many years in cattle-raising and has

written a book on "The Rural Life Problem of the United States." He is the author of several other works, chiefly on Irish subjects. He was the founder of the Irish Agricultural Organisation Society.

For the first time in history the British government has sent a permanent envoy to the Vatican. He is Sir Henry Howard, who was at one time stationed in Washington, and who married Miss Riggs, of that city. Great Britain once sent a special envoy on a special mission to the Pope, but it has not been represented at the Vatican regularly since the other countries of Europe. It is understood that the establishment of this mission is the result of the war. The Pope is expected to take a hand in peace negotiations whenever possible.

**Boy Scout Carries Dispatches.**  
London Tit Bits.  
Among the 230 Belgian refugees who arrived at Birmingham, England, recently was a Boy Scout, who fell into the hands of the Germans while carrying a dispatch to the burgomaster of Brussels. They questioned him very closely, and searched him, but did not find the dispatch, which he had placed in his boot and which he eventually succeeded in delivering at Brussels.

**Merits of a Zigzag Line.**  
London Tit Bits.  
The markings on a graduated measuring glass invented in Germany are made along a zigzag line instead of a vertical one, and having wider spaces between, are said to be read more accurately.

## THE HAIR THAT ARTISTS ADMIRE

Ask an artist what he considers the chief charm of beautiful hair and he will answer that he looks for even color, brilliance and a looseness that eliminates any hard, definite lines. Naturally beautiful and healthy hair is obtained by retaining a perfectly clean head. In washing the hair it is not advisable to use a makeshift, but always use a preparation made for shampooing only. You can enjoy the best color, brilliance and a looseness that is known for about three cents a shampoo by getting a package of canthox from your druggist; dissolve a teaspoonful in a cup of hot water and your shampoo is ready. After its use the hair dries rapidly with uniform color. Dandruff, excess oil and dirt are dissolved and entirely disappear. Your hair will be so fluffy that it will look much heavier than it is. Its lustre and softness will also delight you, while the stimulated scalp gains the health which insures hair growth.—Adv.

# STOMACH RELIEF! NO INDIGESTION, GAS, SOURNESS--PAPE'S DIAEPSIN

Time It! In Five Minutes Your Upset Stomach Will Feel Fine.

You don't want a slow remedy when your stomach is bad—or an uncertain one—or a harmful one—your stomach is too valuable; you must not injure it with drastic drugs. Pape's Diaepsin is noted for its speed in giving relief; its harmlessness; its certain unflinching action in regulating acid, sour, gassy stomachs. Its millions of cures in indigestion, dyspepsia, gastritis and other stomach trouble has made it famous the world over. Keep this perfect stomach doctor in your home—keep it handy—get a large fifty-cent case from any drug store, and then if anyone should eat something which doesn't agree with them; if what they eat lays like lead, ferments and sours and forms gas; causes headache, dizziness and nausea; eructations of acid and undigested food—remember as soon as Pape's Diaepsin comes in contact with the stomach, all such distress vanishes. Its promptness, certainty and ease in overcoming the worst stomach disorders is a revelation to those who try it.—Adv.

(Concluded on Page 7.)