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PANAMA CANAL

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# The PANAMA CANAL



C.A. KRATT

The Land Divided



The World United



Rook (James H.) Company, Chicago

# The Panama Canal

A Pictorial Review of its Construction  
together with Statistical  
Information

COMPLIMENTS OF  
THE PANAMA CANAL  
ON ZONE  
PANAMA-PACIFIC INTERNATIONAL  
EXPOSITION  
1915



### ZONE POLICE

These men are a semi-military organization very like the Canadian Mounted Police. They are a splendid body of men and have brought law and order into the Zone. The majority of the men are Spanish War Veterans

# The Panama Canal



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UNDERWOOD & UNDERWOOD

## COLONEL GEO. W. GOETHALS

Chief Engineer of the Panama  
Canal, in his Office at Panama

The greatest living engineer in charge of the biggest engineering undertaking in the world—not only an engineer but a highly efficient business executive who has “made the dirt fly” to such a good purpose that the great ditch will be completed before the schedule time, and within the cost provided by the Government.

EVERY American citizen justly takes pride in this great national undertaking, and interest deepens as its completion draws near.

We have therefore gathered the authentic views contained in this book, and present them to our friends and patrons so they may see the actual construction of this great Canal, which “divides the land and unites the world.”

In addition to the views, we present valuable statistics compiled direct from official Government reports, giving in concise form a good idea of the magnitude of this enterprise. Thus the book possesses historical interest and educational value, especially for the rising generation, which will be even greater after the Canal is completed, as it will then be impossible to obtain these views.



THE entire length of the Canal from deep water in the Atlantic to deep water in the Pacific is about 50 miles. Its length from shore-line to shore-line is about 40 miles. In passing through it from the Atlantic to the Pacific, a vessel will enter the approach channel in Limon Bay, which will have a bottom width of 500 feet and extend to Gatun, a distance of about seven miles. At Gatun, it will enter a series of three locks in flight and be lifted 85 feet to the level of Gatun Lake. It may steam at full speed through this lake, in a channel varying from 1,000 to 500 feet in width, for a distance of about 24 miles, to Bas Obispo, where it will enter the Culebra Cut. It will pass through the Cut, a distance of about nine miles, in a channel with a bottom width of 300 feet, to Pedro Miguel. There it will enter a lock and be lowered 30 1-3 feet to a small lake, at an elevation of 54 2-3 feet above sea level, and will pass through this for about 1½ miles to Miraflores. There it will enter two locks in series and be lowered to sea level, passing out into the Pacific through a channel about 8½ miles in length, with a bottom width of 500 feet. The depth of the approach channel on the Atlantic side, where the maximum tidal oscillation is 2½ feet, will be 41 feet at mean tide, and on the Pacific side, where the maximum oscillation is 21 feet, the depth will be 45 feet at mean tide.

Throughout the first 16 miles from Gatun, the width of the Lake channel will be 1,000 feet; then for 4 miles it will be 800 feet, and for 4 miles more, to the northern entrance of Culebra Cut at Bas Obispo, it will be 500 feet. The depth will vary from

85 to 45 feet. The water level in the Cut will be that of the Lake, the depth 45 feet, and the bottom width of the channel 300 feet.

Three hundred feet is the minimum bottom width of the Canal. This width begins about half a mile above Pedro Miguel locks and extends about 8 miles through Culebra Cut, with the exception that at all angles the channel is widened sufficiently to allow a thousand-foot vessel to make the turn. The Cut has eight angles, or about one to every mile. The 300-foot widths are only on tangents between the turning basins at the angles. The smallest of these angles is  $7^{\circ} 36'$ , and the largest  $30^{\circ}$ .

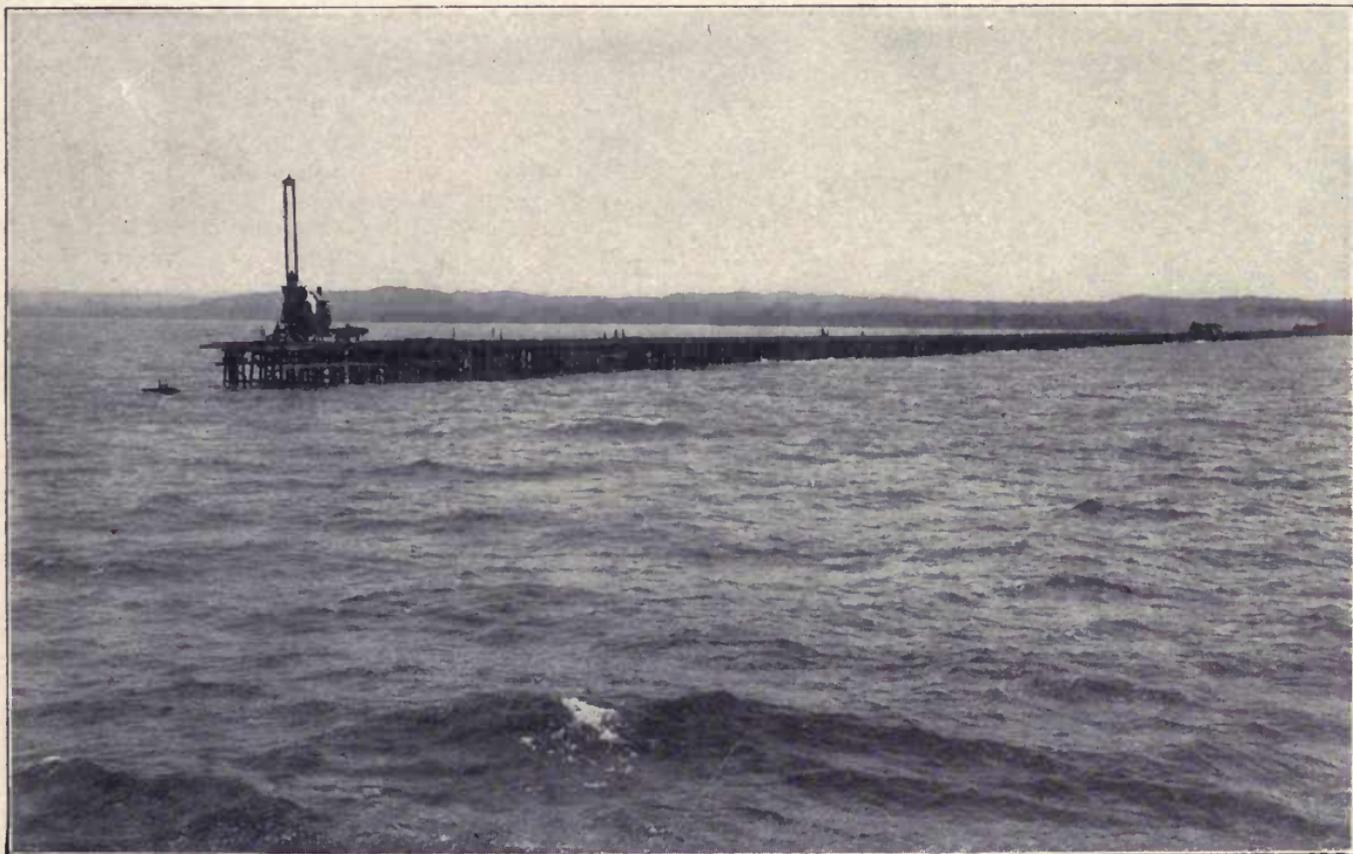
The Canal Zone contains about 448 square miles. It begins at a point three marine miles from mean low water mark in each ocean, and extends for five miles on each side of the center line of the route of the Canal. It includes the group of islands in the Bay of Panama named Perico, Naos, Culebra, and Flamenco. The cities of Panama and Colon are excluded from the Zone, but the United States has the right to enforce sanitary ordinances in those cities, and to maintain public order in them in case the Republic of Panama should not be able, in the judgment of the United States, to do so.

Of the 448 square miles of Zone territory, the United States owns the larger portion, the exact amount of which is being determined by survey. Under the treaty with Panama, the United States has the right to acquire by purchase, or by the exercise of the right of eminent domain, any lands, buildings, water rights, or other properties necessary and convenient for the construction, maintenance, operation, sanitation, and protection of the Canal, and it can, therefore, at any time acquire the lands within the Zone boundaries which are owned by private persons.

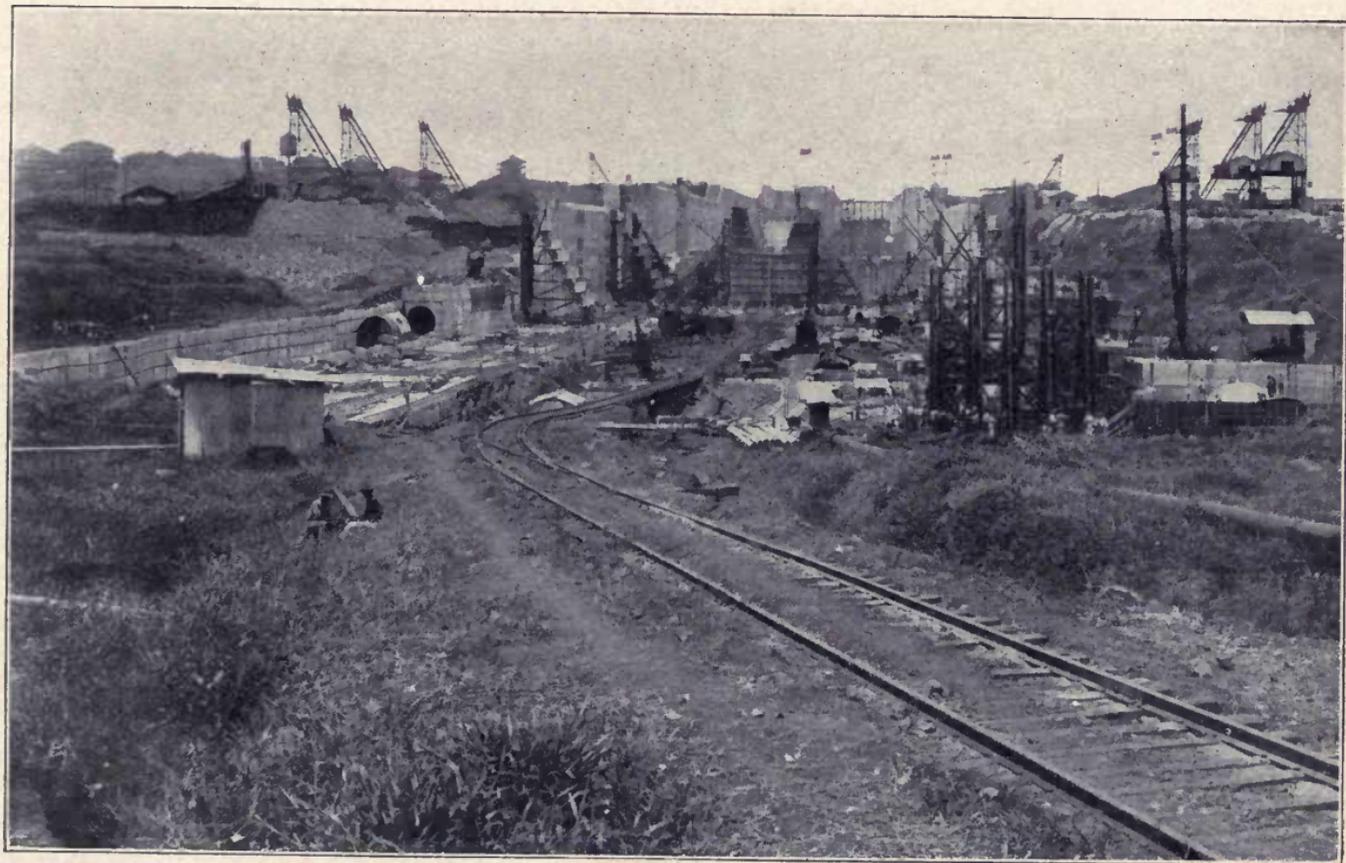
# Canal Statistics

Authorized by Act of Congress, June 28, 1902

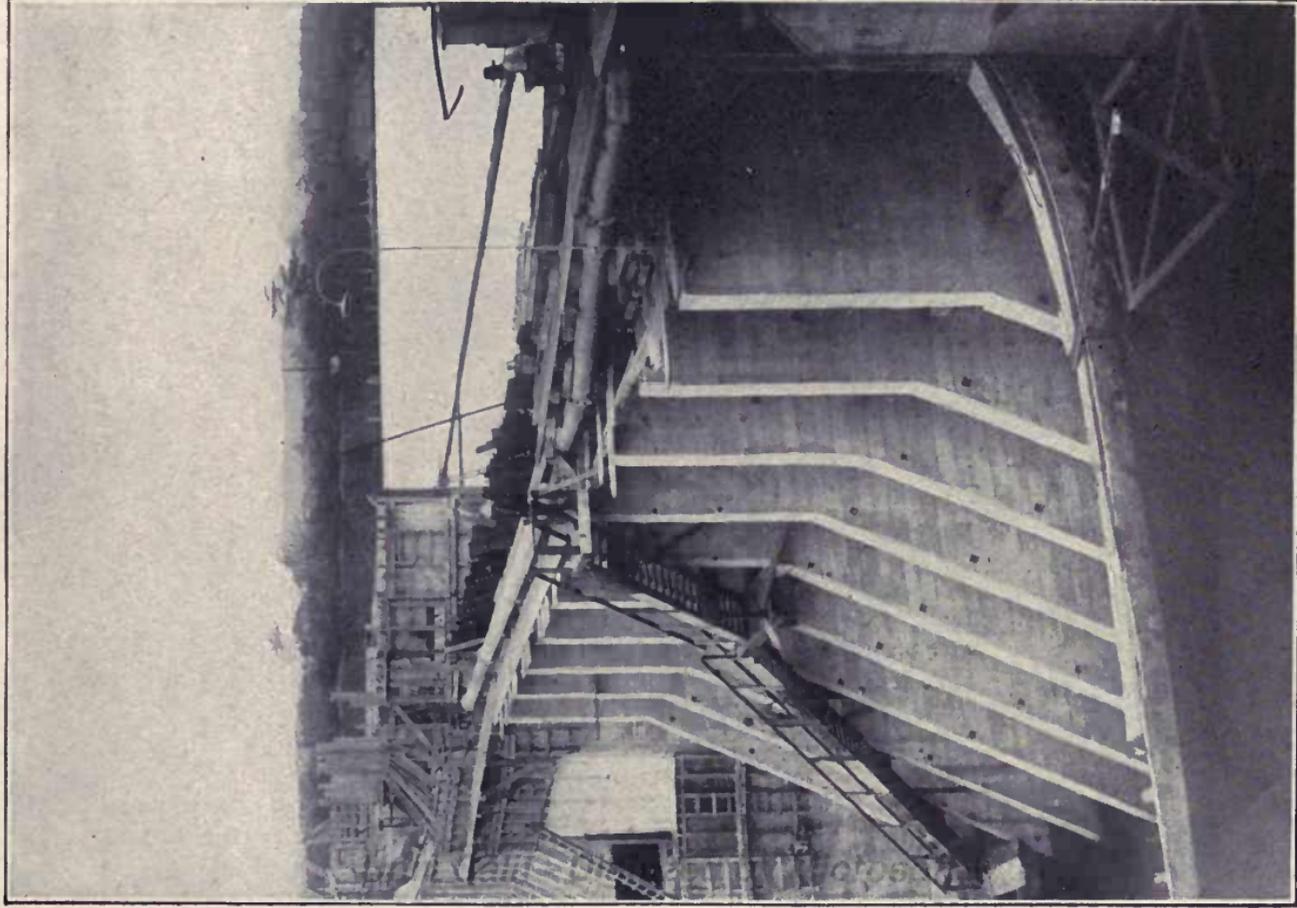
Length from deep water to deep water (miles).....	50	Excavation by French, estimated value to Canal.....	\$25,389,240
Length from shore-line to shore-line (miles) .....	40	Value of all French property.....	\$42,799,826
Bottom width of channel, maximum (feet) .....	1000	Concrete, total estimated for Canal (cubic yards).....	5,000,000
Bottom width of channel, minimum, 9 miles, Culebra Cut (feet).....	300	Time of transit through completed Canal (hours).....	10 to 12
Locks, in pairs.....	12	Time of passage through locks (hours) .....	3
Locks, usable length (feet).....	1000	Relocated Panama Railroad, estimated cost .....	\$9,000,000
Locks, usable width (feet).....	110	Relocated Panama Railroad, length (miles) .....	47.1
Gatun Lake, area (square miles)....	164	Canal Zone, area (square miles)....	448
Gatun Lake, channel depth (feet)...	85 to 45	Canal and Panama Railroad force actually at work (about).....	35,000
Culebra Cut, channel depth (feet)...	45	Canal and Panama Railroad force, American (about).....	5000
Excavation, estimated total (cubic yards) .....	182,537,766	Cost of Canal, estimated total.....	\$375,000,000
Excavation, amount accomplished May 1, 1911 (cubic yards).....	137,750,520	Number of men employed, about....	45,000
Excavation by the French (cubic yards) .....	78,146,960	Work begun by Americans.....	May 4, 1904
Excavation by French, useful to present Canal (cubic yards).....	29,908,000	Official date of completion.....	Jan. 1, 1915



*Only Call - Digitized by Microsoft*  
Torro Point Breakwater, from the Sea. One Mile of Trestle Completed



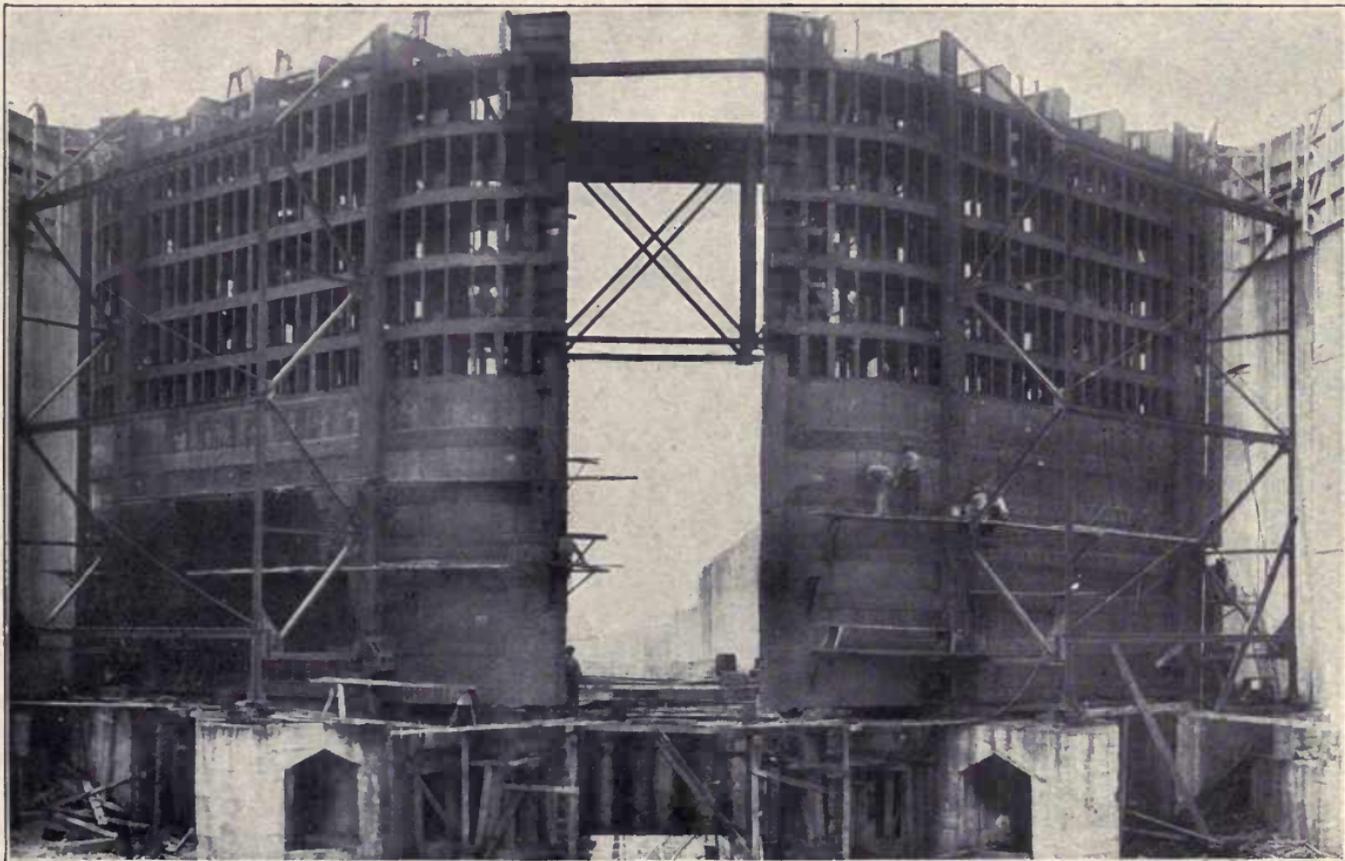
Gatun Lower Locks, Looking South, Showing Middle and Upper Locks in the Distance



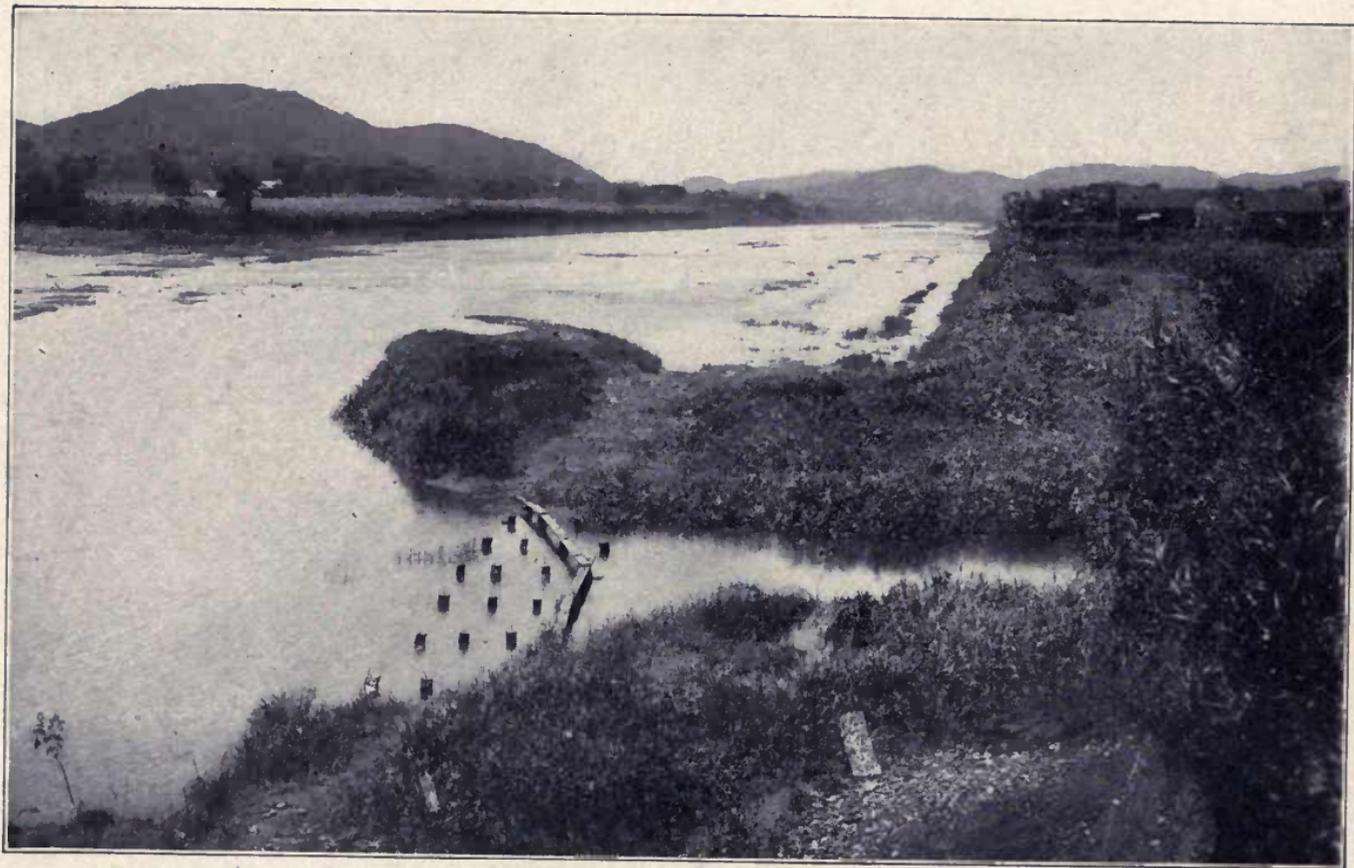
Temporary Dam at Atlantic Side of Gatun Locks



Gatun Dam, East Section, Showing Discharge from Suction Dredge, with Hydraulic Fill, Looking West



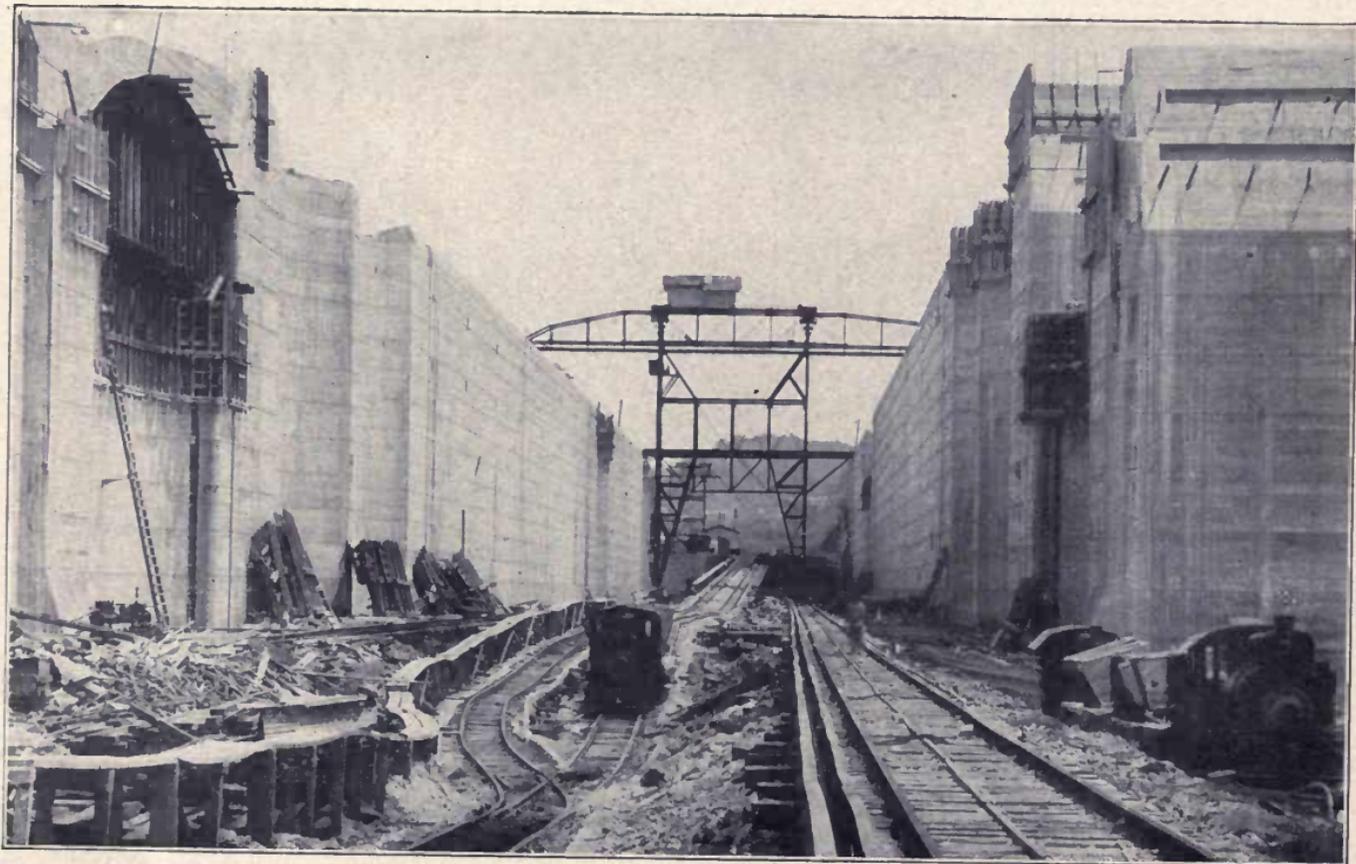
Gatun Upper Locks, View Looking North, Showing Progress of Construction of Upper Gates in the East Chamber



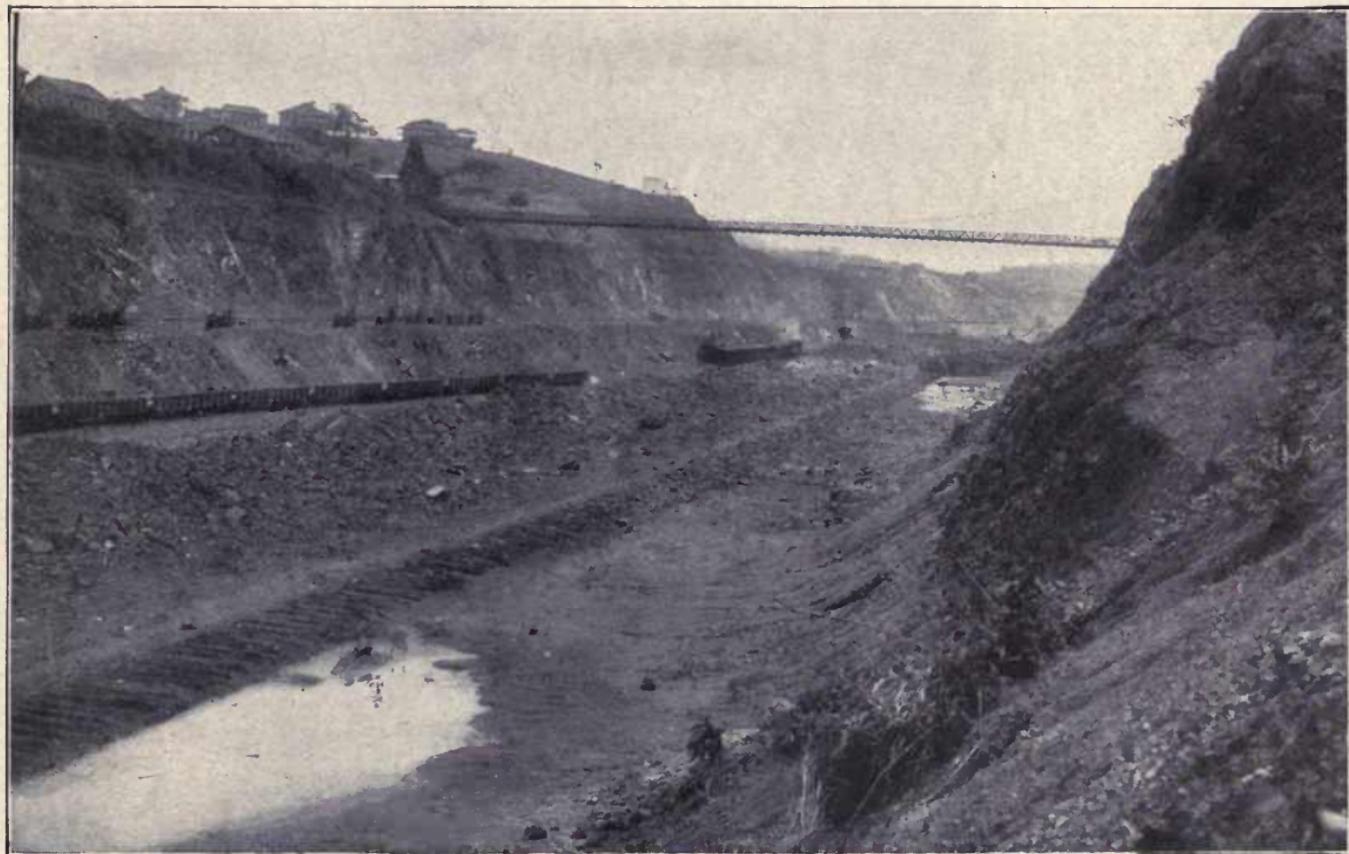
Point No. 4, Near Gorgona, Looking South, Showing Completed Channel, 500 Feet Wide



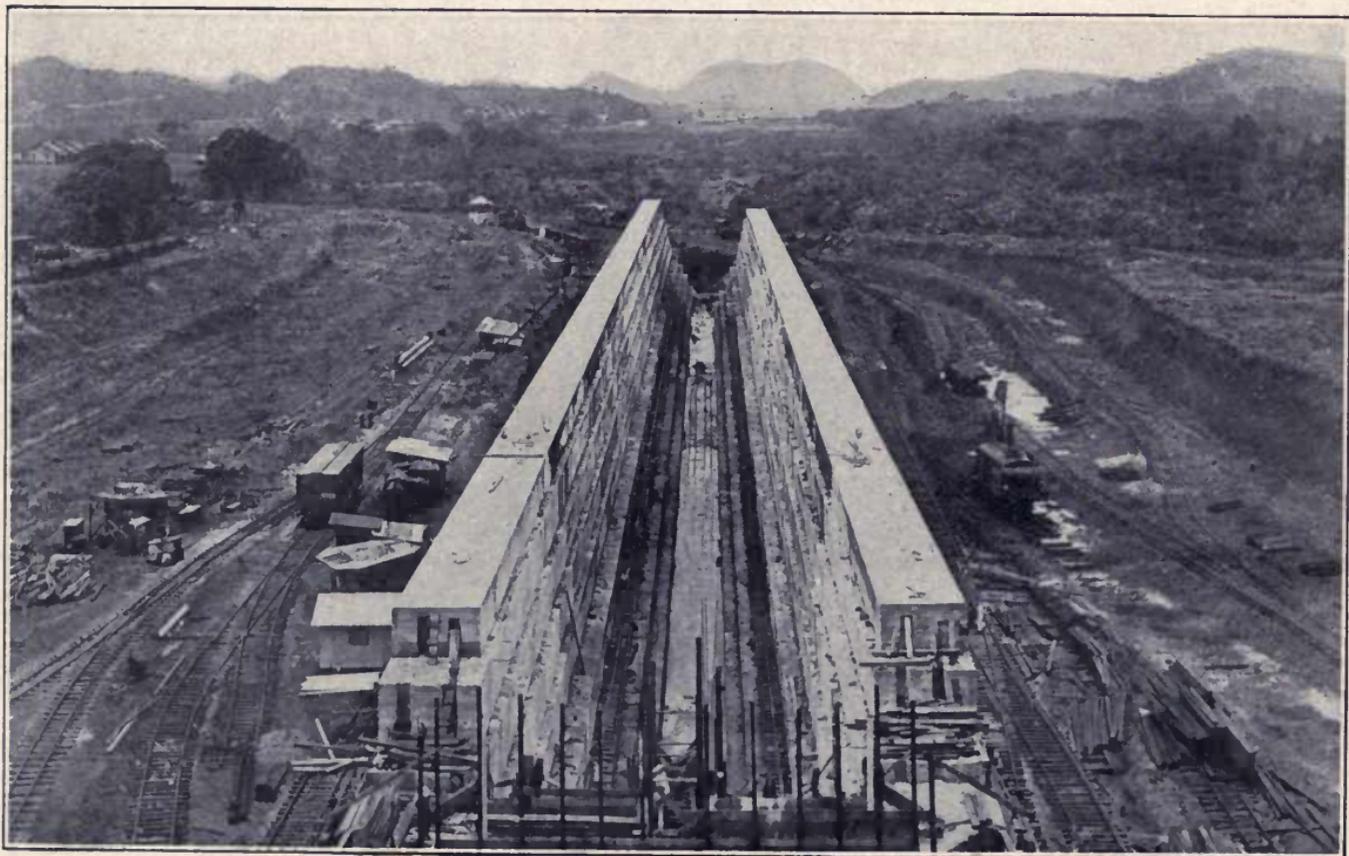
Culebra Cut, Looking North, Between Contractor's Hill and Gold Hill



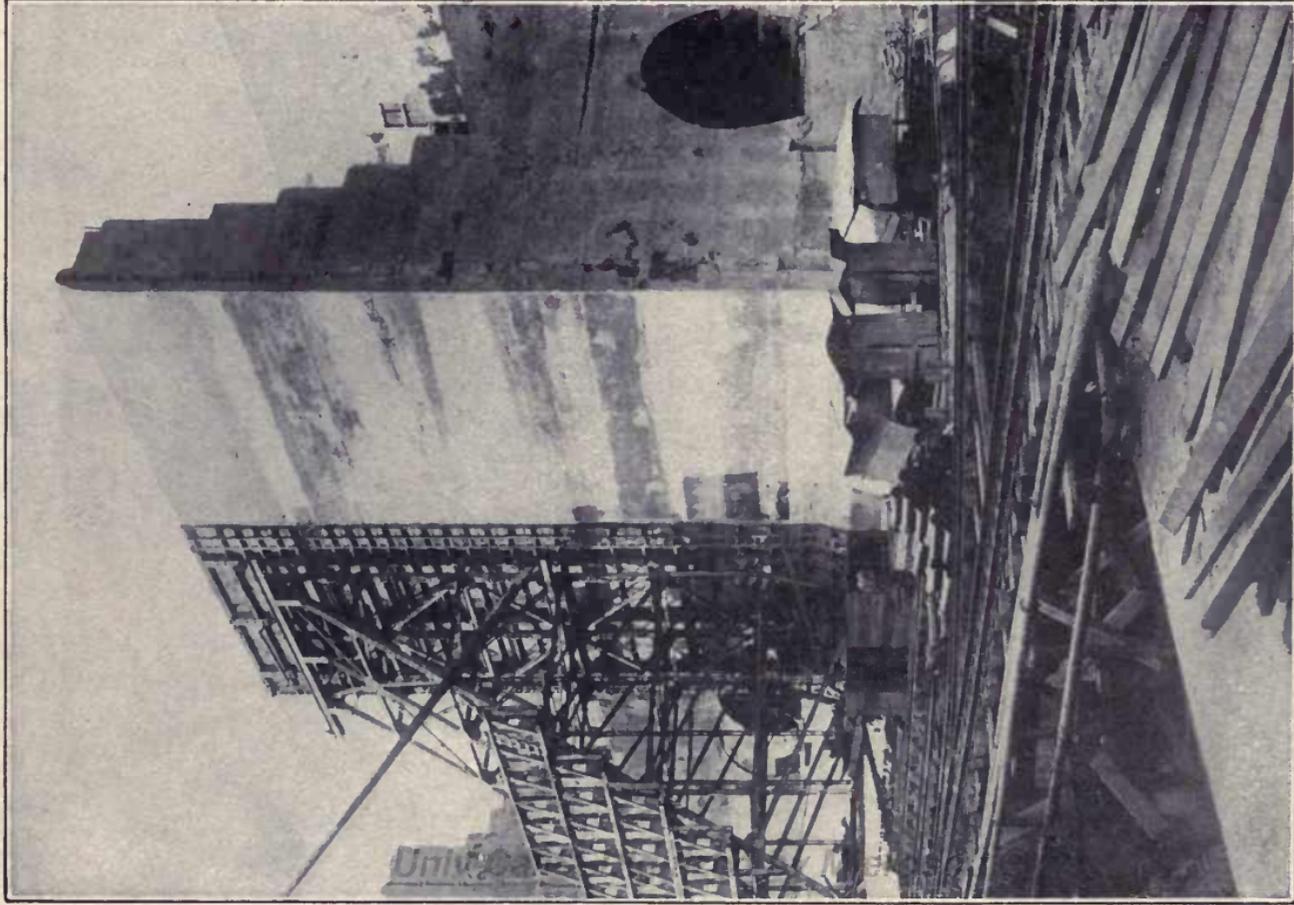
Pedro Miguel Locks, East Chamber Looking North



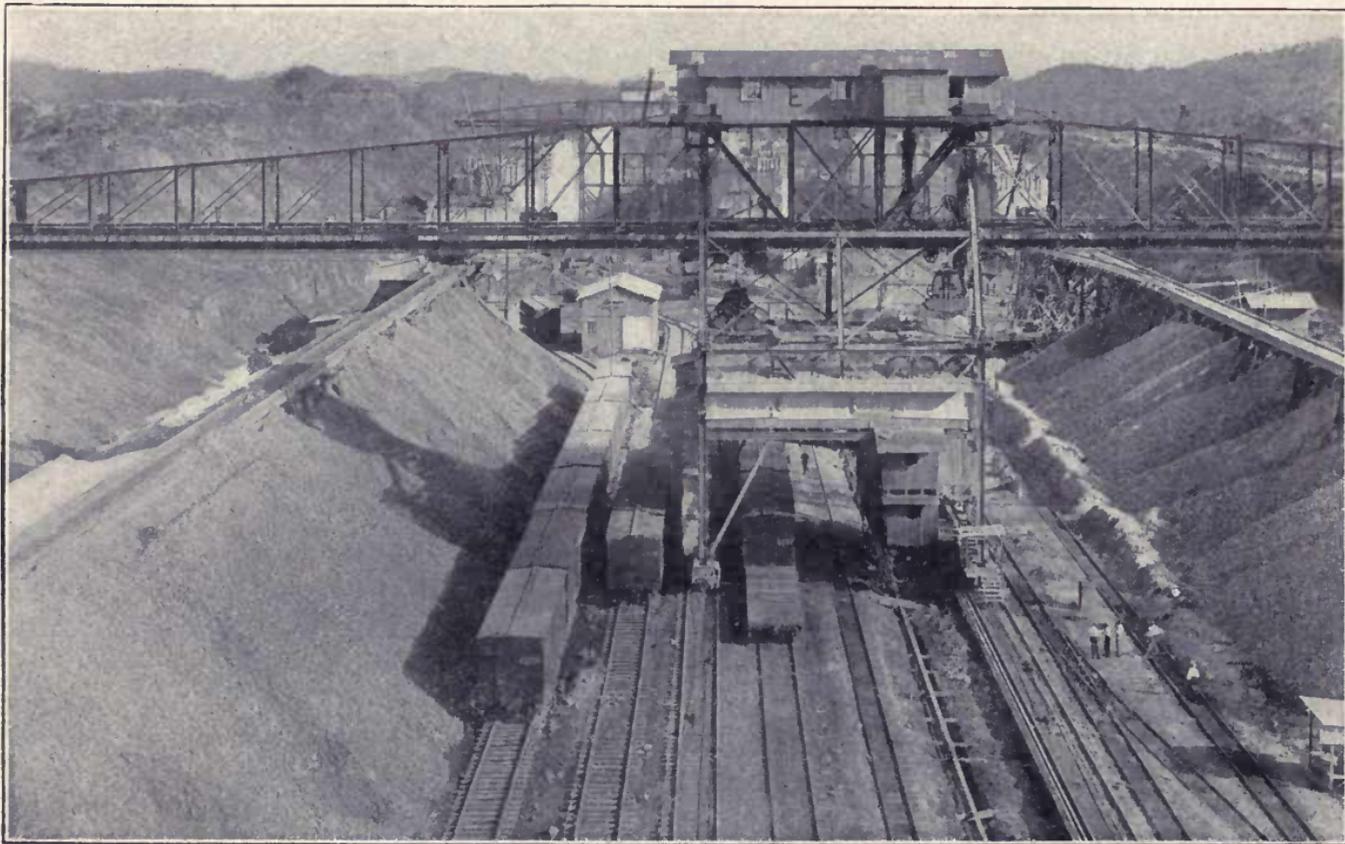
Culebra Cut at Empire Suspension Bridge. Bottom of Cut to be 57 Feet Lower where the Cars Stand



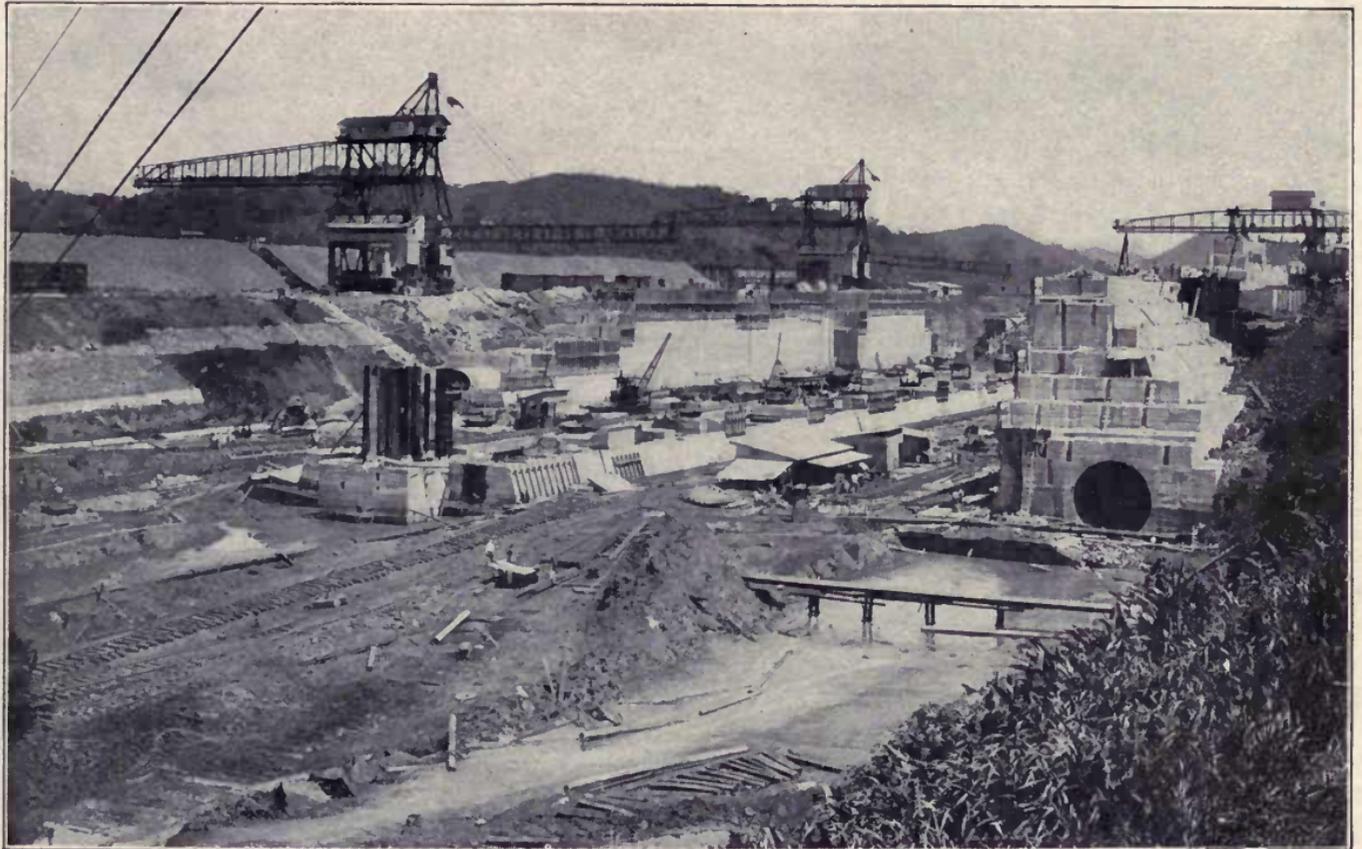
Bird's Eye View of Pedro Miguel Locks, Looking South



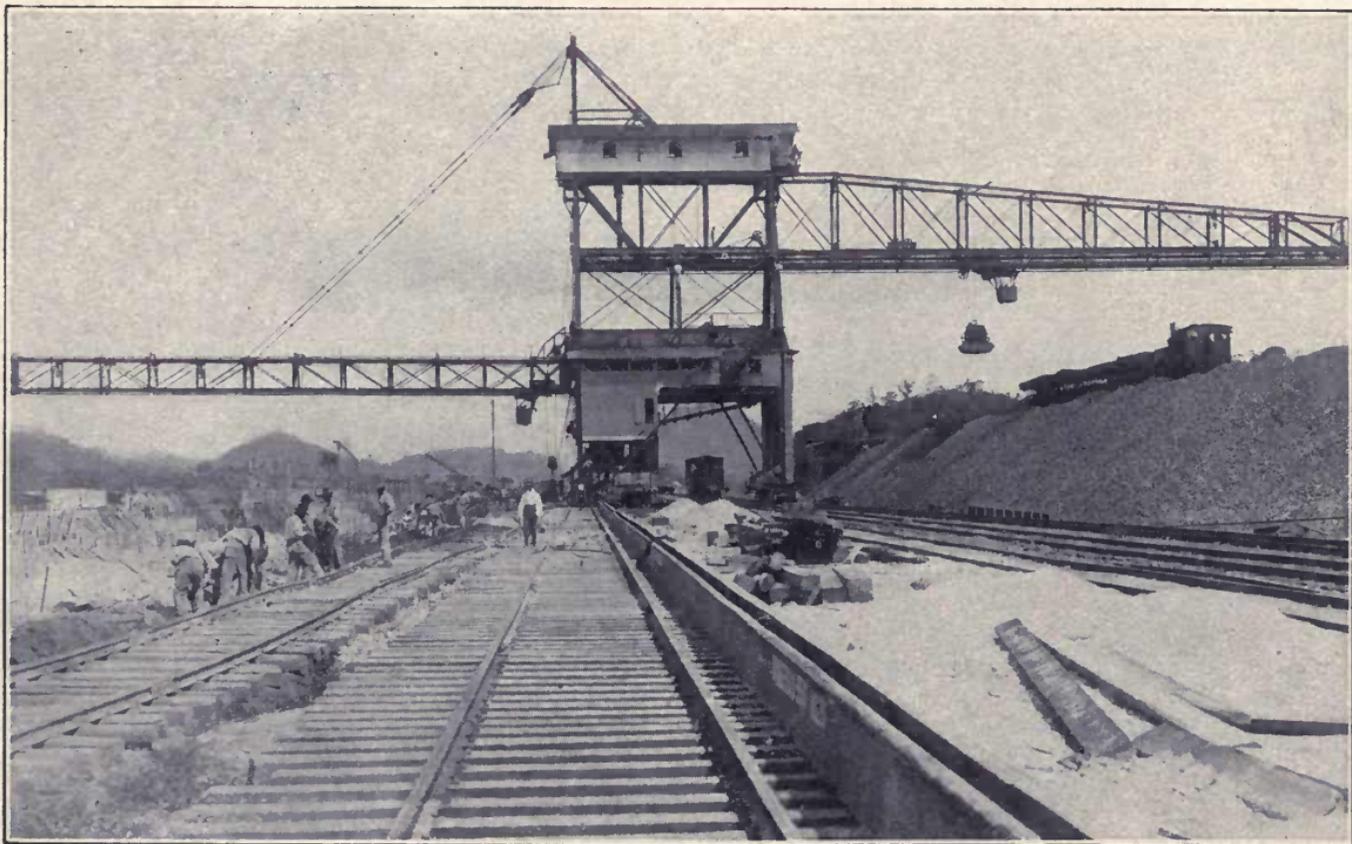
Showing Part of a Lock. The concrete work is 90 feet high. The metal work is the mould. The round hole in the right will be used to fill the locks with water, and is large enough for a railroad train to pass through



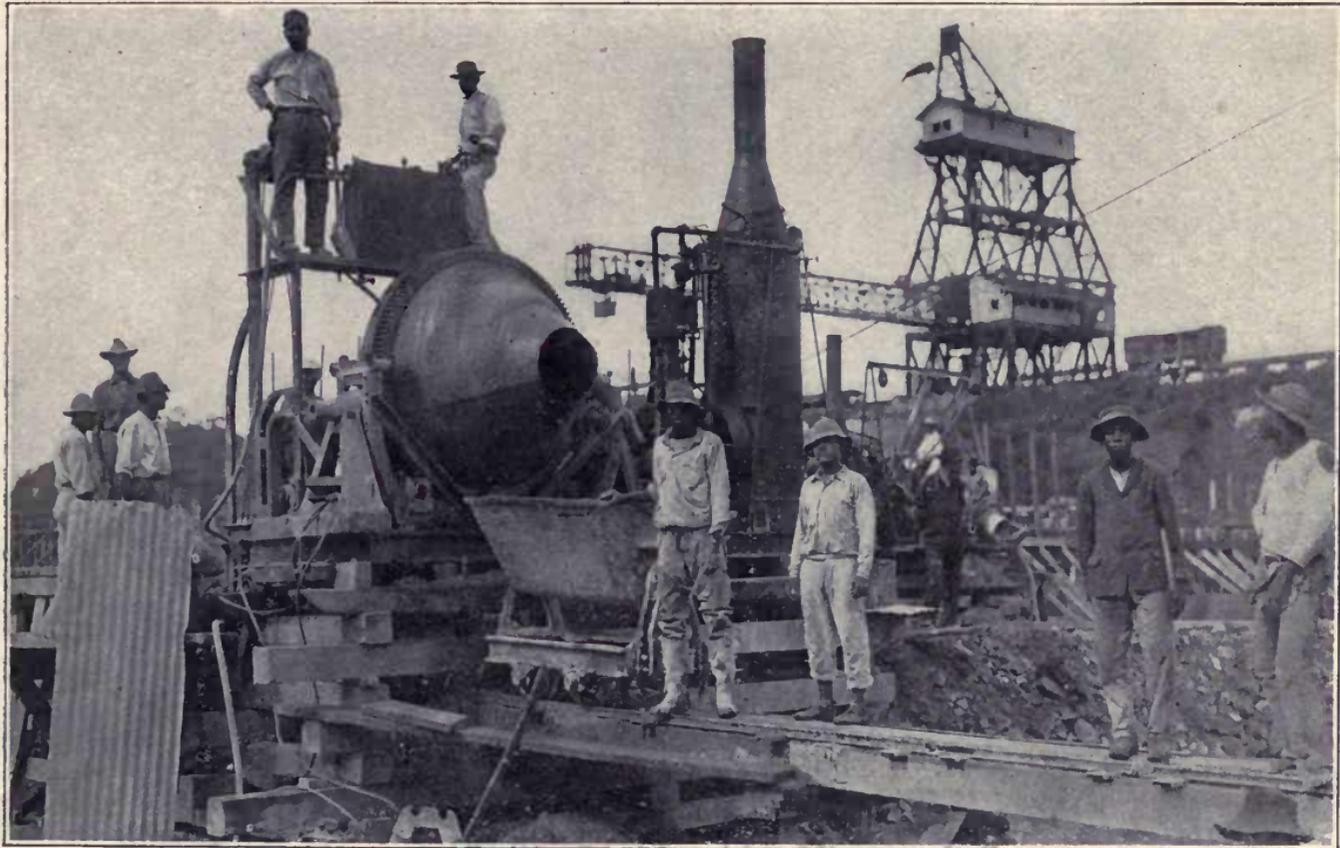
A View Looking South from Top of Berm Crane at Pedro Miguel, Showing Stoning Trestles, Berm Crane and General View of Locks



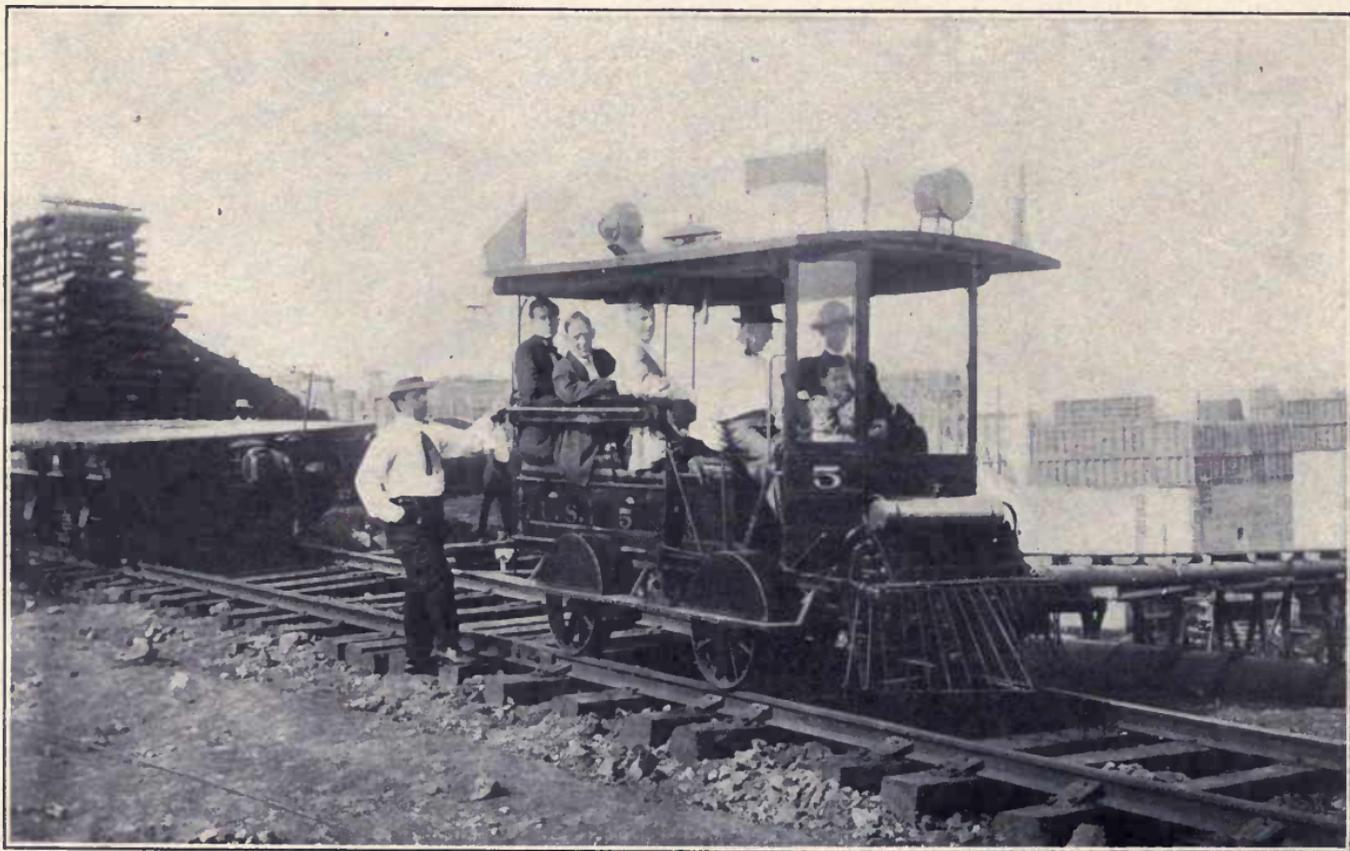
Miraflores Upper Locks. General View, Looking North from Lower East Bank



A View of one of the Berm Cranes as they appear at Miraflores. They are used for Mixing and Conveying Concrete



Showing the Portable Concrete Mixers in Use at Miraflores Locks



Automobile Railway Bus, used by the U. S. Government at Panama



General View of Panama Bay and Ancon Hill *ft*®

















