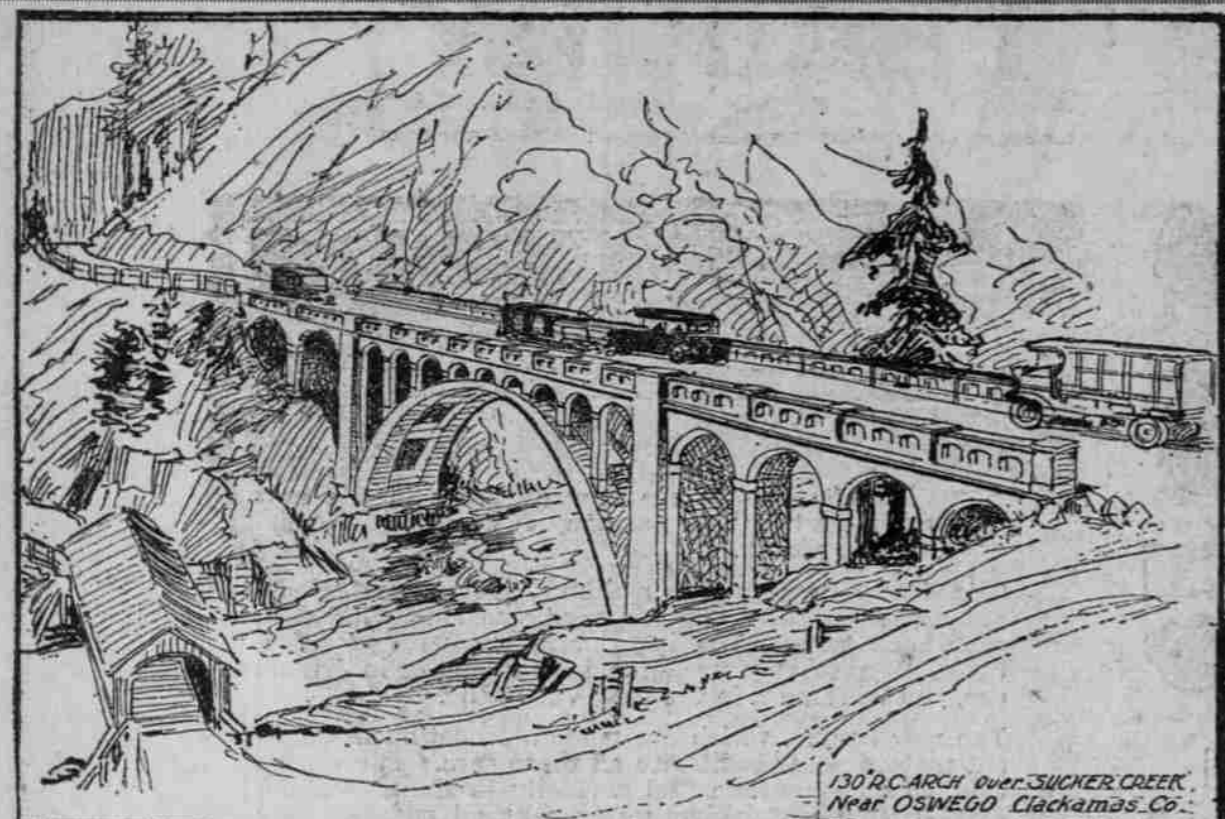
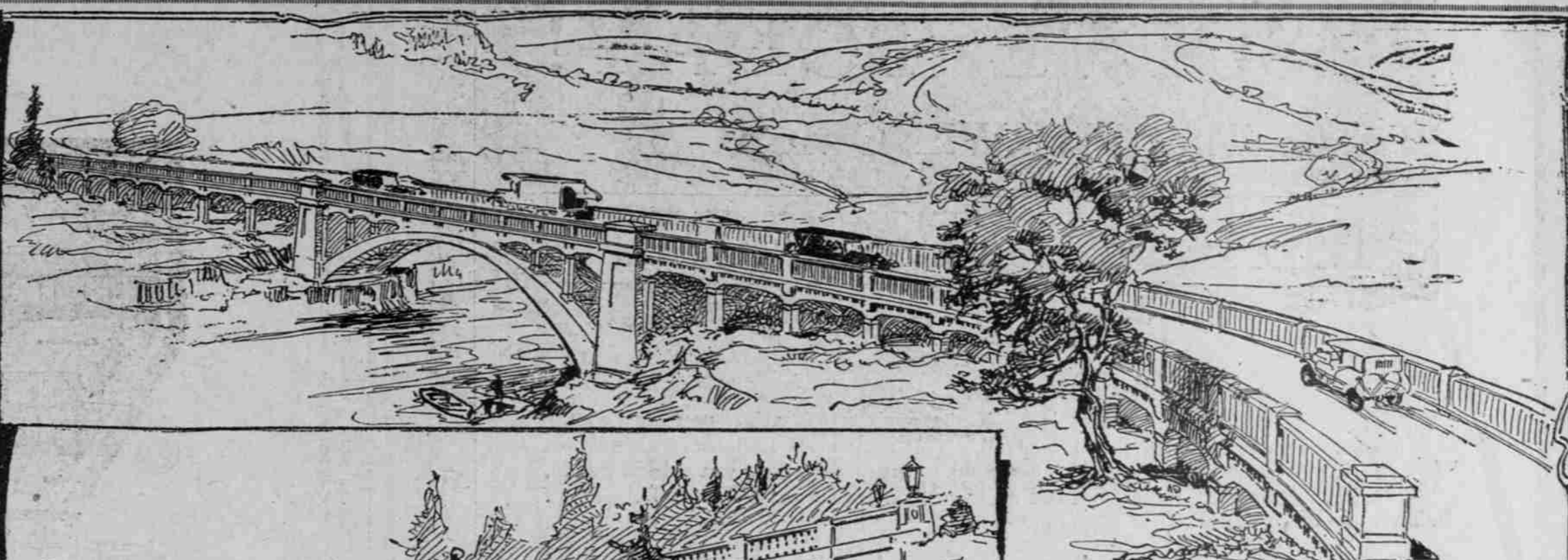


BRIDGES ON OREGON HIGHWAY SYSTEM ARE OF LATEST MODERN DESIGNS

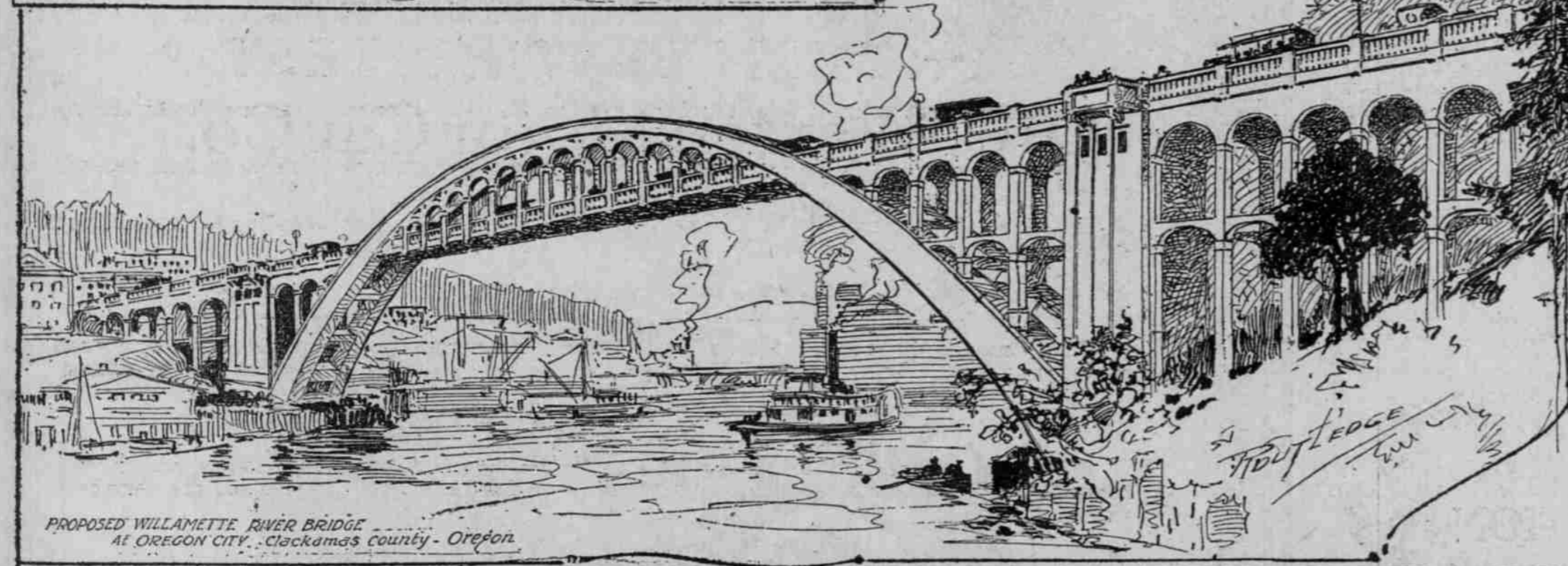
State Has 157 Structures Under Way at Estimated Cost of \$1,715,000—Spans Are Being Built for Permanent Service, Contrasting Old-Time Period When No Fixed Policy Existed—Art and Strength Are Big Features



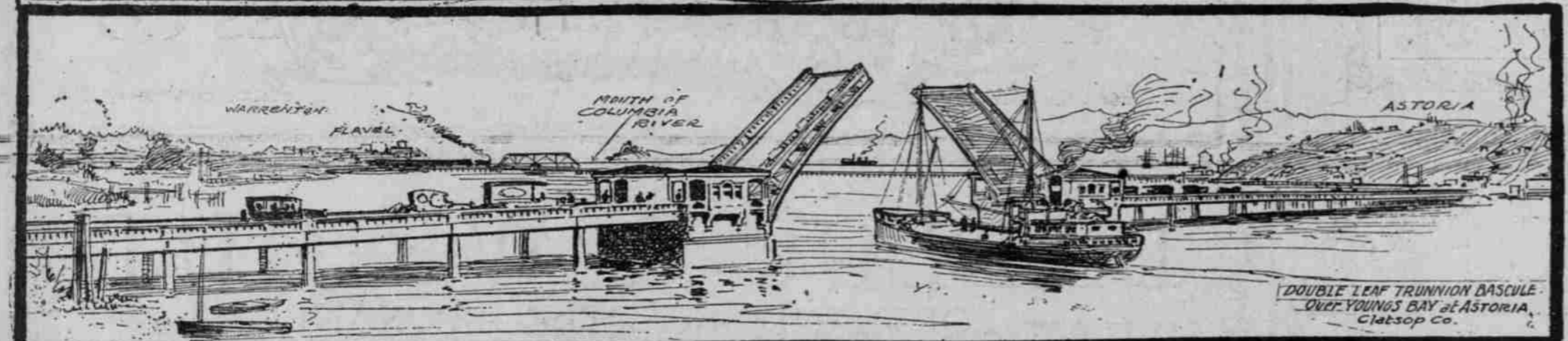
130' ARCH OVER SUGAR CREEK, NEAR OSWEGO, CLACKAMAS CO.



ROGUE RIVER BRIDGE AT ROCK POINT, JACKSON CO.



PROPOSED WILLAMETTE RIVER BRIDGE AT OREGON CITY, CLACKAMAS COUNTY, OREGON.



DOUBLE LEAF TRUNNION BASCULE AT YOUNG'S BAY, ASTORIA, CLATSOP CO.

By C. H. McCullough, Bridge Engineer, State Highway Commission.

NEW states have launched a bridge-building programme greater in scope and magnitude than that now under way by the state highway department of Oregon. Since May 1, 1919, designs have been prepared for 136 bridge structures, large and small, representing an estimated expenditure of \$1,715,000. One hundred and fifty-seven of these bridges are now under construction and contracts for the building of the greater portion of those remaining will be let in the very near future.

Among the larger structures designed is a bridge across Young's bay at Astoria. The channel span of this structure is what is known as the "bascule" type, differing from the ordinary swing span in that each leaf or segment of the movable portion revolves in a vertical plane about a fixed pin, or "trunnion" attached to the pier. The word "bascule" coming from the French, signifies a balance and the modern bascule bridge is fitted with counter weights constructed in such a manner as to maintain an exact balance throughout the entire movement of the bridge.

Curiously enough, the bascule which is regarded by engineers as among the most modern and up-to-date types of movable bridge construction, has its prototype in that most ancient of all bridge structures, the medieval draw bridge, used to span the moat

surrounding the feudal castle wall. In ancient times, the bascule was raised to barricade the castle doorway and to create an impediment to the progress of an approaching enemy. The bascule of today is raised to afford clearance for navigation and thus permit of bridge construction on a lower level than would be otherwise possible. The structure at Young's bay is what is known as the simple trunnion type of bascule, resembling in detail the now famous East Lake and Fremont bridges recently built by Seattle, structures which, by the way, have been repeatedly rated by bridge engineers as among the most efficient and satisfactory movable bridge structures yet built.

The structure at Young's bay will be 1800 feet in length with a clear roadway of 20 feet. Raising and lowering the channel span is accomplished by means of electrical power, both leaves being controlled from a reinforced concrete operator's house placed on the deck at the side of the roadway.

The design for the arch bridge at Oregon City contemplates a main channel arch of about 360 feet span and 120 feet rise, flanked by reinforced concrete viaduct approaches, the entire structure being somewhat less than 1000 feet in length. In the field of reinforced concrete this structure will be without precedent although there are a number of steel arches considerably longer, notably

the Niagara Clifton bridge, having a state highways today with the time a change having its origin, perhaps, honored and highly inefficient construction being erected on our a marked change in the old order. The road of yesterday was popu-

larly regarded as merely a path from farm to market and bridge structures were notably flimsy and lacking in the substantial and stable features which characterized the railway span. The road of today is a link in a busy transportation system, a system which is fast eclipsing in magnitude the rail and water systems of former years. Bridge structures on such a transportation system to adequately carry the traffic, differ very little in weight and cost for those designed for rail traffic loadings.

The history of the development of highway bridge construction is the history of a conflict—a conflict between far-sighted and public-spirited policies and those actuated by motives of jealousy, ignorance and conceit, policies moreover which from time to time were fanned into flaming activity by selfish private interests, whose programme of exploitation of public funds would have been seriously antagonized by consistent and intelligent progress.

From the beginning of time, the man with a message has found an unsympathetic audience. Centuries ago when Father Noah began to tell

the populace that it was going to rain, they undoubtedly straightway went forth and purchased ponces shirts and white canvas oxfords, carefully "hooking" their umbrellas in order to provide sufficient funds and so with the highway engineer, who for years has been striving to bring home to the taxpaying public a true appreciation of the evils and folly of the old system, or rather lack of system, in bridge construction to emphasize the necessity for intelligent engineering supervision and design and for funds sufficient to provide stable and adequate structures.

The fight has been a long one and has been complicated and made more difficult by certain private interests, mostly a petty class financially and morally irresponsible, who by gross misrepresentation of facts and the adoption of most unscrupulous methods were in many cases successful in vitiating the work of the engineer, impugning his motives and sowing the seed of doubt and discontent among the local governing bodies, county and municipal.

Old System Extravagant. During the years which preceded the national awakening for constructive road and bridge building, the folly and extravagance of the old system was shown up in such an amazing number of instances as to constitute a veritable storehouse of ammunition for the engineer in his fight for intelligent administration.

Several years ago an investigation

covering about 80 concrete bridge structures constructed without engineering plans or supervision was conducted by a state highway department in a middle western state. The investigation revealed the startling fact that 70 per cent of these structures were defective, over 10 per cent were actually unsafe and nearly all required more or less repair and maintenance from time to time. Not only this, but the first cost was from 6 per cent to 25 per cent in excess of that for like structures constructed by the state department, none of which had developed the flaw or defect.

The evils of the old system are now history in Oregon and those who have been interested in the development of the highways of the state look upon the programmes now being carried out as the successful culmination of a long and hard fought battle. The passing of the Oregon road law placed the construction of all bridge structures on state highways under the direction of the engineering department of the state highway commission and further provided that engineering assistance be rendered the various counties upon request. Abuses of the old system, therefore, will not occur on state roads and it remains for the future to determine whether the counties will avail themselves of the assistance provided by law and go forward with a definitely organized intelligent campaign, or will fully repeat the mistakes and blunders of former years.

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The thoughtfully placed refinements and conveniences add to the essential character value of the car. It is the touring car naturally expected of the builders of America's first car—of an organization with the spirit and principles established through twenty-six years of successful automobile manufacturing.

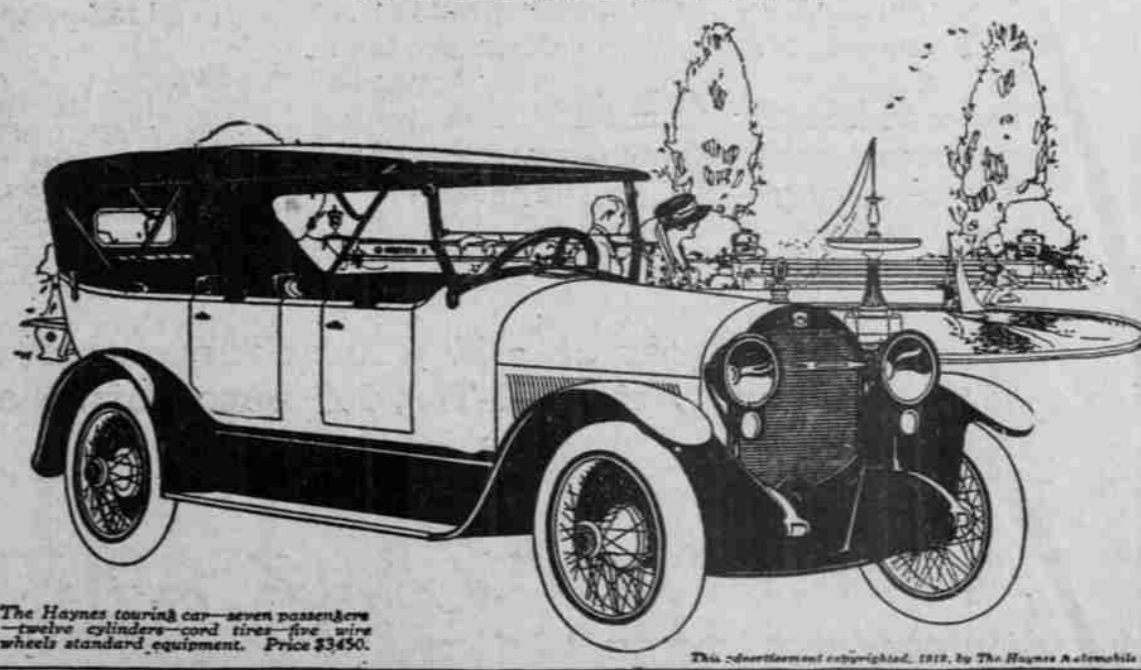
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Roadster—Four doors, 4 Passenger	2685	Roadster—Four doors, 4 Passenger	3450
Coupe—4 Passenger	\$3100	Coupe—4 Passenger	\$4000
Sedan—7 Passenger	3150	Sedan—7 Passenger	4200
Limousine—7 Passenger	4200	Limousine—7 Passenger	4200

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A. C. STEVENS Distributor. Sixteenth and Washington, Portland, Or.



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