

FEDERAL AID SPEEDS WORK

8,046 Miles Built in 1928; Improved Total Now More Than 70,000

Through federal aid to states the improved road mileage was increased by 8,046 miles during the fiscal year of 1928, according to the recently issued report of Thomas H. MacDonald, chief of the bureau of public roads.

The total net length of highways bettered through federal assistance was brought to 70,852 miles, much of the mileage of 116,901 untouched by federal aid has been improved, records of the American Association of State Highway Officials show. Most of the mileage receiving attention by states and counties without federal aid have reached only the early stages of improvement, these records indicate. As matters stood January 1, the federal aid system had received no improvement whatever.

Brick Roads Lead
During the fiscal year of 1928 the mileage of concrete pavement on the system was increased by 2,131 miles to a total of 17,514 miles. Brick roads were increased by 190 miles to a total of 318; bituminous concrete by 153 miles to 1,933; bituminous macadam by 647 miles to 4,317; water-bound macadam by 127 miles to 1,426; gravel by 2,360 miles to 37,698; sand-clay by 892 miles to 10,811 miles. In addition, 635 miles of dirt roads were graded and drained.

Mr. MacDonald, in his report, stresses the wisdom of concentrating federal cooperation in road matters on a limited mileage of highways. By pursuing this plan the most used highways in the United States are receiving attention first, thereby benefiting the greatest number of road users.

Bus Service to Grow
Surveys of traffic carried by the roads in several states indicate the extent of burdens borne by federal aid roads. Mr. MacDonald's report states:

"The remarkable developments that have recently occurred in the design and use of common carrier buses are probably no more than the beginning of a much further development that is to occur in this form of conveyance.

"Traffic congestion, until recently a serious problem only in the cities, has moved outward and imposes its time-consuming delay and menace to life and property upon the principal highways in the vicinity of the large metropolitan centers."

These factors will be carefully considered in federal aid plans according to Mr. MacDonald. &SYP... 7-20b.0edTD00adaw.

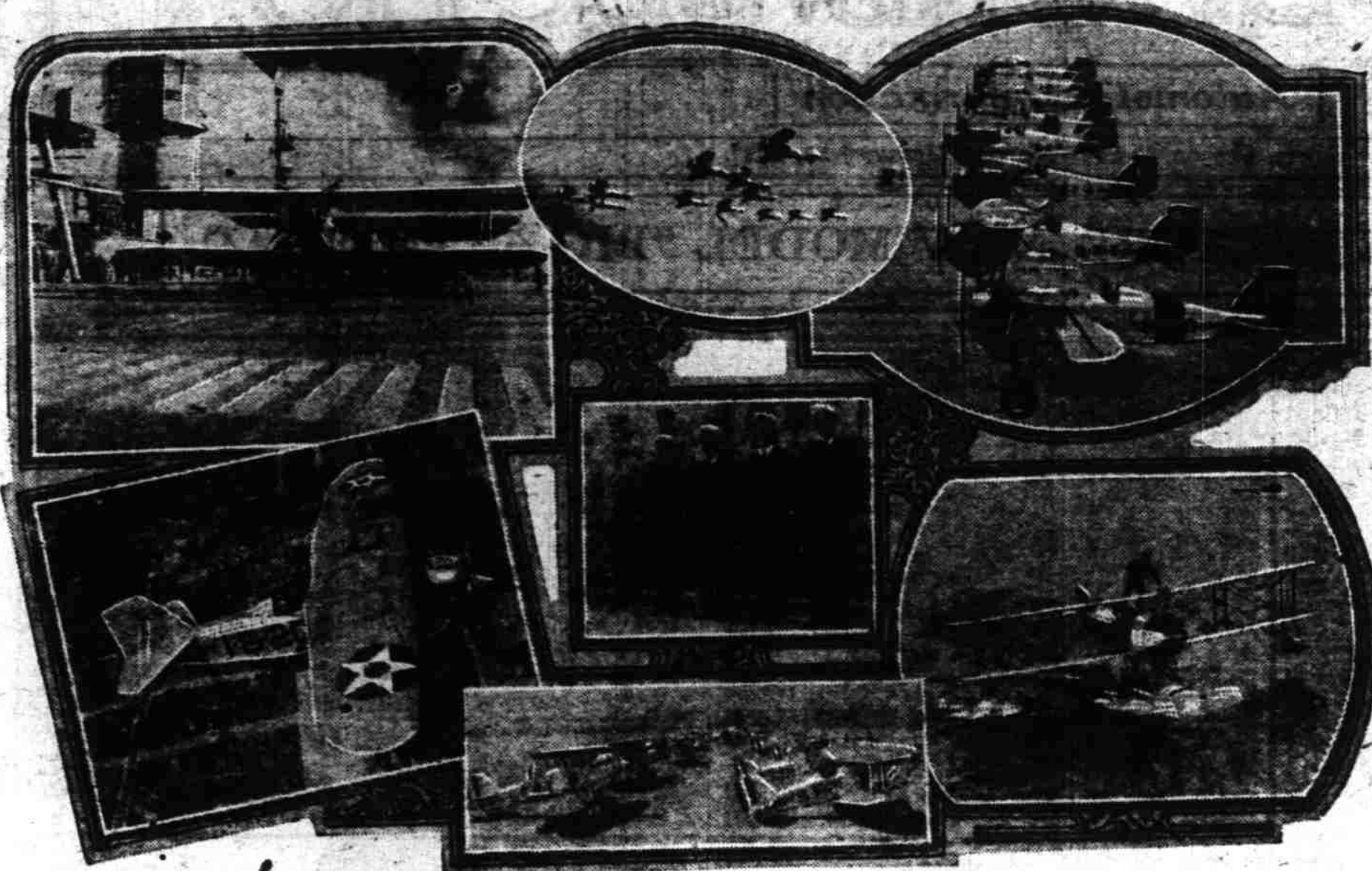
AGING CONCRETE GAINS STRENGTH

Moist-cured concrete gains strength with each passing year. Experiments extending over a period of ten years on this subject have recently been completed by the research laboratories of the Portland Cement Association, Chicago.

At the time these tests were started it was generally believed the strength of concrete increased indefinitely—today scientific research has proved it.

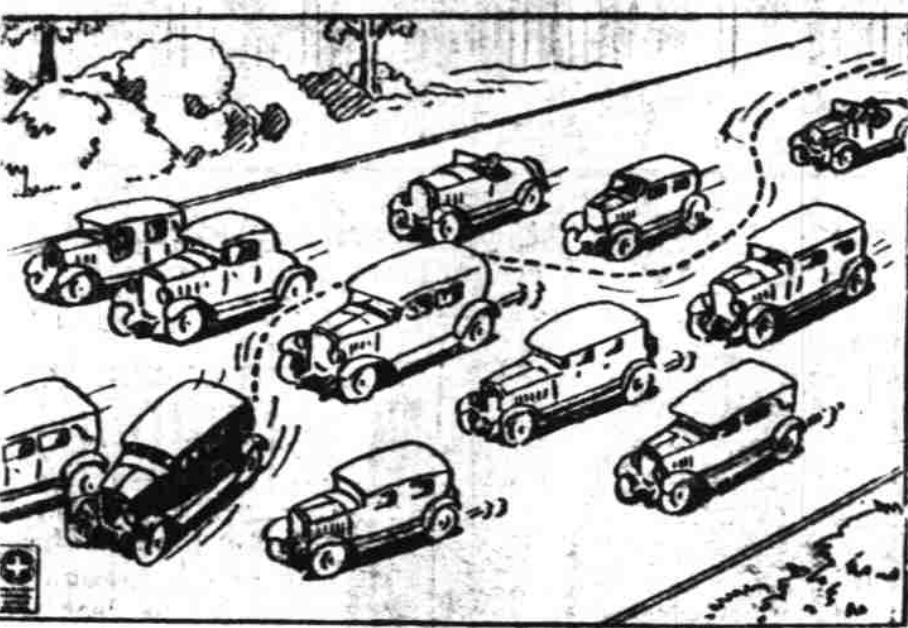
Cylinders each six inches in diameter and 12 inches high were made from separate batches of concrete and cured in a moist atmosphere of 70 degrees Fahrenheit. At the end of seven days several of these cylinders were crushed and the breaking load recorded. Similar tests were performed after 28, days, three

The Navy Spreads Its Wings



Top, left—Martin torpedo-bombers lined up on deck of U. S. S. Lexington preparatory to taking off. Center—The famous VB2B squadron that thrilled the crowds during the National Air races with its daring maneuvers flying in formation over battle fleet. Right—Precision drill by navy fighters, one of the most remarkable formation flight photographs ever taken. Rear Admiral J. M. Reeves, commanding aerial squadrons of battle fleet, second from the right, and his staff. Lower, left—Navy fighter poses for picture in mid-air. Center—Navy fighters lined up at North Island, San Diego, preparatory to flying aboard U. S. S. Lexington for maneuvers. Right—Observation plane coming under boom to be lifted aboard battleship.

Look Out for the Human Rabbit!



HE DRIVES an automobile and he sees his way through traffic at a most alarming speed. Taking a chance means nothing to him—either for himself or for the other fellow. He is always in a terrible hurry and dodges in and out of the lines of traffic as if he were going to a fire.

Once in a while this fellow is stopped—usually when he crashes into the other fellow's car. Ordinarily, however, there is not much

chance to catch him. When he is captured he becomes known as a "hit-skip" driver, and usually pays for his speed and his carelessness. The National Safety Council advises automobilists to give the human rabbit all the room he wants, for he will just naturally take it anyway. It will save you a lot of time and worry to let him have the right-of-way until such a time as the law can get hold of him and properly take care of the gentleman.

months, six months, one year, two years and five years.

When the 10 year old specimens were crushed and the results tabulated these decade-old cylinders were found to be twice as strong as the 28-day specimens and about 20 per cent stronger than those tested at one year. Since concrete gains strength with age instead of losing it, the weakening effect of time has been largely overcome in concrete structures.

Caterpillar Sixty Hits Snow Drifts To Open Highways

A roar! Snow files and a rugged "Caterpillar" Sixty crashes through the frozen drifts that South Dakota roads may be open to "traffic as usual"—as the big tractor "fared" full tilt into the snow blockades a cameraman caught the picture, and now it

LOS ANGELES, Jan. 19.—(Special Correspondent)—Conditions of actual warfare will be simulated when the 250 naval planes, representing the three wings of the service, the fighters, the observers and bombers, form up over the fleet for the opening of the combined air and naval maneuvers in Central American waters late this month.

More than 200 planes concentrated on the Pacific coast, manned by the pick of the navy, sailed from Los Angeles and San Diego harbors aboard the three airplane carriers, Saratoga, Lexington and Langley, and the ships of the battle fleet—to unite with the squadrons of the Atlantic scouting fleet off Panama. Together the air squadrons of the Pacific and Atlantic will represent the most powerful aerial striking force in the world.

Three Wings Famous
The glamour of combat rides with the fighters and for that reason the fighting wing is the best known in and out of the service, particularly since the performance of the famous "Three Sea Hawks" at San Diego and at the National Air races at Mines Field last summer, but it cannot dim the brilliant record of either the observation wing or the torpedo-bombing wing.

The planes of the fighting wing of necessity must possess the maximum of maneuverability and speed. At present the Boeing single-seater, powered with Pratt and Whitney engines are being used. One of the new Boeing midget ships in a test at Mines Field during the air races climbed from the ground to a height of 10,000 feet and back again in less than five minutes. Of the six squadrons of fighters, Squadron One and Two base normally on the U. S. S. Langley; Four and Six on the U. S. S. Saratoga and Three and Five on the U. S. S. Lexington.

In preparation for this cruise each squadron carried out a pre-arranged program of gunnery exercises. This included different

forms of machine gun, bombing and combat work.

Observers Must Fight
The routine training of the pilots in the fighting wing includes intercepting and attacking "enemy" planes, protecting observation and bombing planes and attacking enemy surface craft.

The observation wing consists of three squadrons of Vought Corsair two-seater biplanes which are located with the three battle divisions. Each squadron is composed of twelve planes whose primary purpose is to assist the battleships in gunfire control. To accomplish this they fly out to a point where they can observe the fall of the shots and then radio back the results to the ships. They are equipped with pontoons which enable them to land on the water, and are launched into the air from the decks of the battleships by means of catapults.

In a manner similar to that followed by the fighting wing, the observation pilots carry on regular competitive programs of fixed and free machine gun fire, bombing and combat work. These pilots have developed fine technique in fire control and are particularly proficient in controlling long-range firing.

Take-off Interesting
The torpedo and bombing wing—workhorses of naval aviation—is based on the giant Saratoga and Lexington. All of the planes of this wing are Martin torpedo-bombers designed to carry heavy loads.

In taking off, these heavy planes point their noses toward the bow of the Lexington or Saratoga and fly straight into the

wind. This operation is particularly interesting. When ready to send these planes into the air, the carrier heads into the wind and maintains a speed of from 15 to 20 knots. Besides the ship's speed, such breeze, as may be sweeping the deck adds to the speed of the plane's takeoff. With a combined ship-wind speed of 25 knots, it becomes comparatively easy for the big bombers to soar into the air after a short run down the deck. These big planes carry as many as four bombs and a heavy torpedo weighing 1800 pounds. After accomplishing their mission the bombers fly by the carrier, get the "all clear" signal, glide down into the secret arresting gear and stop in a distance of less than 100 feet on the deck.

Land Without Trouble
And so safe is this method of handling airplanes that of the 600-odd landings on the Lexington there have been only six accidents and no fatalities. The Saratoga and Langley also have records that compare favorably with those of any of the civil landing fields or airports.

The significance of the forthcoming concentration—and achievements of the past year in naval aviation, navy officers point out, lies in the fact that for the first time in history a navy has developed an aerial striking force capable of concentrating 5,000 miles from home and still be able to deliver a crushing blow against any enemy it might confront.

The perfection of airplane carriers with an immense storage space for both planes and gasoline has made this possible. The carriers when they left Los Angeles, carried a sufficient amount of gasoline, loaded from the barges of the Union Oil company of California, to propel the 250 planes halfway around the world. The navy has met the demand of the nation for a highly trained, powerful air force, and is spreading its wings southward to spread its wings

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