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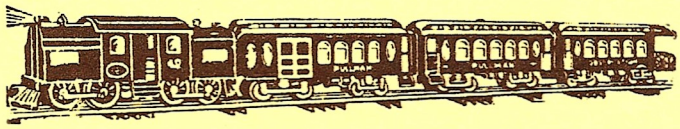


PROGRESS

"THE LAUREL WREATH FOR TRANSPORTATION PROGRESS MUST GO TO THE UNION PACIFIC RAILROAD"

—George Creel in Collier's, August 5, 1933

Cover is courtesy of The Railroad Club of Chicago.

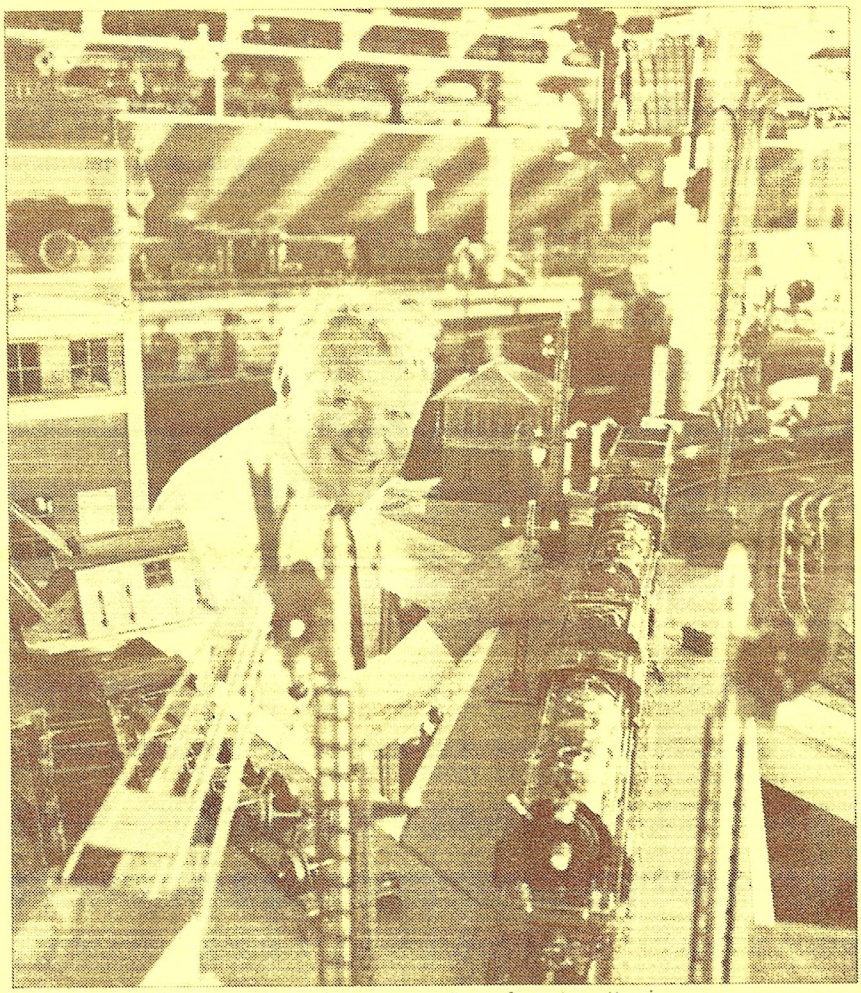
UNION PACIFIC

Personal Affairs

Edited by William G. Flanagan

Electric trains are losing favor with kids hung up on video games, but the ranks of senior model railroaders continue to swell.

Playing on the railroad



Thomas W. Sefton, president of San Diego Trust & Savings Bank
Wouldn't let the kids touch his.

By John A. Byrne

THOMAS W. SEFTON, president of San Diego Trust & Savings Bank, is one grown-up toy train collector who has long since done away with any pretenses. There was a time he would sneak up to the attic at night, while his son and daughter were fast asleep, and spend hours setting up a prewar electric train set that served as a regular Christmas treat.

"The kids went up on Christmas Day," Sefton recalls with a laugh, "but I wouldn't let them touch it."

That was over 20 years ago. Now Sefton boasts what may be the largest toy train set of its kind in the world. Jammed into a 20-by-50-foot space in his home in San Diego are prewar Lionel trains and accessories—500 feet of track, more than 200 locomotives and 500 cars—worth a small fortune. Sefton reckons his collection's value at several hundred thousand dollars. "If my wife found out how much it was all worth," he says, "she'd probably want me to divest it and take a few trips abroad."

A lot of folks would. Nostalgia for what are remembered as simpler days and a scarcity of authentic specimens have made model railroading an expensive hobby these days, at least for those with a taste for vintage stuff. A set of Lionel trains that might have cost only, say, $32.50 in the 1930s can command hundreds and even thousands of dollars at auction today.

What has developed into quite a serious hobby really breaks down into two branches: collecting and model railroading.

Some fans, like Amtrak President Graham Claytor, actually run their trains only at Christmastime. He finds year-round joy in collecting No. 2 gauge trains, starting with the first U.S. model electric train, made by Carlisle & Finch in the late 1890s. For others, like entertainer Frank Sinatra, whose layout is legendary *(see p. 8)*, *National Enquirer* Chairman Generoso Pope, or Larry Sokol, a Portland, Ore. attorney, collecting trains seems less fulfilling than operating them. Sokol says: "I would like to reduce myself to 3/16th scale one day and walk along the tracks of my layout, hop into a locomotive and operate it."

Is there a fortune in old trains lying in your attic? Don't bet on it. Not all kinds of electric trains are avidly sought by collectors. As a rule, the narrower gauges of trains, such as HO and N, are likely to have little collector value because they haven't been around as long as Lionel, which first began producing trains in 1901, or

Thomas Sefton is TTOS #189

FORBES DECEMBER 19, 1983

CAL STEW 4 U !!!

THE SEFTON FOUNDATION IS THE MAJOR BENEFACTOR OF THE TTOS MUSEUM EXHIBIT

W. Graham Claytor, Jr., is TTOS # 330

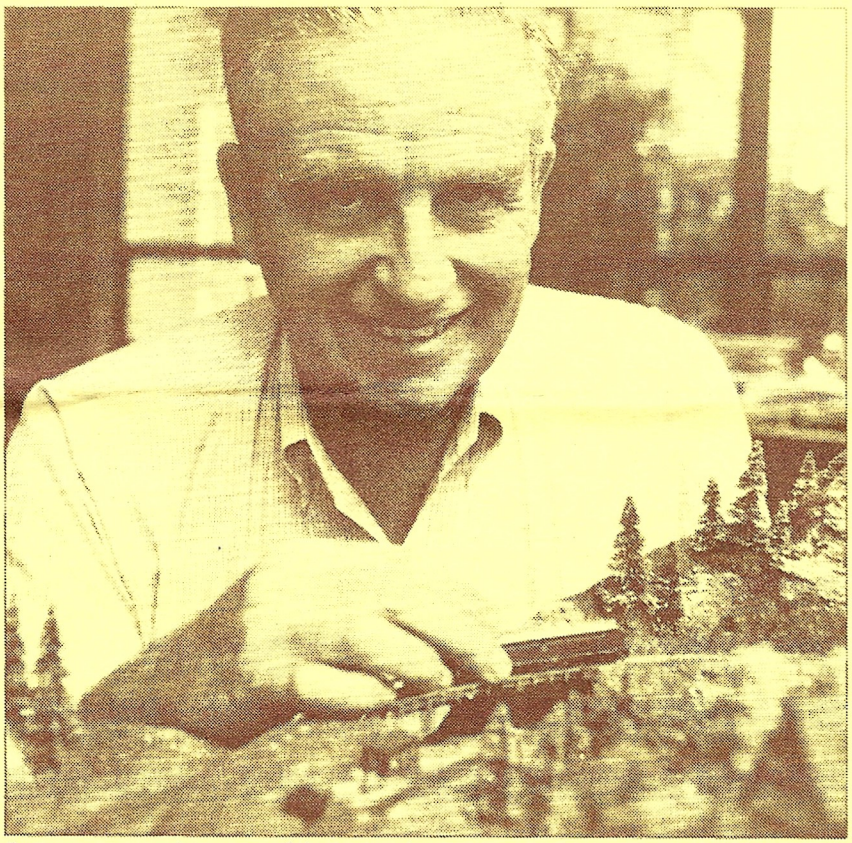
American Flyer, made by the A.C. Gilbert Co. from 1946 to 1966.

Even old Lionel trains don't necessarily fetch big prices, particularly if they were parts of mass-produced starter train sets. What have increased are the trains and accessories that were originally sold singly and in limited quantities.

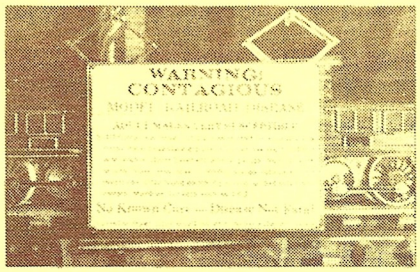
Some prewar Lionel standard gauge trains, for instance, discontinued as long ago as 1942, are worth little more than Lionel versions made as recently as three years ago. Even seemingly extraordinary items may carry little real value. Consider A.C. Gilbert's famous Talking Railroad Station. It automatically halted a train, emitting sounds of hissing steam, chugging pistons and whistles along with the conductor's shout of "All aboard for New York, Philadelphia, Chicago and all points west." The item sold for $19.95 in 1952. One in good condition today would command only $50 to $75 from a collector.

One of the priciest items is a preproduction Lionel 381 Olympia Electric Locomotive, issued in the late 1920s. A collector offered $50,000 recently for that one engine. Regular versions of the 381 made from 1928

Graham Claytor, Amtrak president
His wife "permits" a loop under the Christmas tree every year.



Generoso Pope, chairman of the National Enquirer
One of three train layouts in his basement.



Larry Sokol, Portland, Ore. attorney
S-gauge trains in his law office.

Continued on page 8

CAL-STEWART, SANTA CLARA, CA. MARCH 23-25. LET'S GO. BIGGEST WESTERN SPRING MEET.

THE M-10000 story is reprinted from the February 1984 issue of THE RAI

THE RAILROAD CLUB OF CHICAGO invites out-of-town memberships which include subscription to the monthly publication, "THE RAILROAD CAPITAL". Send $6 to Don Kotz, 530 61st Street, Kenosha, WI 53140.

M-10000: A FIFTY YEAR PERSPECTIVE

(Zenon Hansen)

While delivery of Union Pacific M-10000 on February 12, 1934 marked the real beginning of the streamliner era on American railroads, this event in itself was the culmination of a chain of events extending back several years. To begin with, let's set the record straight - it was the first American streamliner designed for mainline service. The first true aerodynamically streamlined cars to enter revenue service aywhere were the ten Brill "Bullet" cars built for the Philadelphia & Western in 1931 and still in service today on SEPTA. In December 1932 the Deutsche Reichsbahn took delivery of the world's first diesel streamliner, which entered revenue service between Berlin and Hamburg as the "Flying Hamburger" on May 15, 1933. The UP's order to Pullman and Electro-Motive announced May 24, 1933 was obviously influenced by these events.

Since the UP was anxious to have the nation's first streamliner, it opted for a 600 HP Winton model 191-A distillate power plant. Considerable trouble with the Winton model 201 prototypes powering the GM exhibit at the Century of Progress Exposition made the UP leery, but Ralph Budd of the Burlington held out for the diesel. The completely redesigned model 201-A turned out to be quite successful, so his gamble paid off with no significant loss of time or prestige. The nation's first diesel streamliner, Burlington Zephyr no. 9900 was ordered from Budd (no relation to CB&Q's president) and EMC on June 17, 1933 and was completed April 7, 1934, less than two months behind the UP train.

Since Pullman was entering completely new territory in designing its first streamliner, it retained noted aeronautical and automotive designer William B. Stout, best known for designing the Ford Trimotor, the nation's first successful airliner, as a consultant. Stout incorporated his basic ideas regarding railroad equipment in a test vehicle called the "Railplane", which he built for Pullman in his laboratories in Dearborn, Michigan in late 1933.

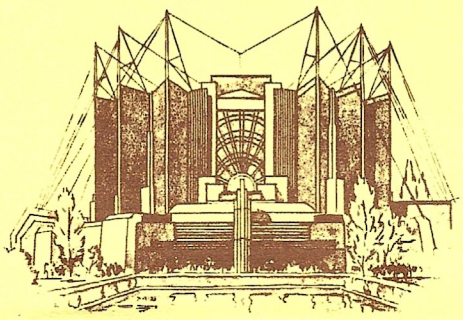
Stout's idea regarding trains of the future envisioned "wingless airplanes on tracks carrying passengers, mail, and express across the country at 90 to 110 MPH". This was shown in a popular magazine illustration of the period depicting Los Angeles and Chicago in a straight line, with an "old train" (steam heavyweight) covering the 2298 miles in 61 hrs., compared to the "new train" (M-10000) taking "about 21 hrs." In other words, a lightweight, aerodynamically streamlined train on existing right-of-way would produce an instant "Shin-Kansen" (ironic literal translation: "New Line"), or "TGV"!

That this was taken seriously is borne out by the fact that the first two UP streamliners were delivered without conventional dining or lounge facilities, and all of the first four were so ordered in 1933. Passengers were to be served airline style by cart from a small kitchen in the tail of the train. On reflection, if such speeds could have been maintained, such a concept wa not as "far out" as it might seem today, since the train would have taken about twice the flight time of a Boeing 247 at a fraction of the fare. Nonetheless, this idea was probably a victim of the gruelin 57 hour Los Angeles - New York run of M-10001 in October, since all long distan UP streamliners had diner-lounge cars added to their original orders in late 193

Another Stout concept was that while aircraft floated free (drifted) and hence needed to be streamlined only from the front, ground vehicles were fixed to thei right-of-way and therefore needed to be streamlined against cross-currents as well. Using the example of a turtle shell he proceeded to design M-10000 with a unique cross-section in which the sides tapered inward from the bottom. This concept resulted in considerably smaller cross-section and somewhat cramped accomodations, befitting an "airplane fuselage minus wings", but was nonetheless retained for the first four trains.

While the original renderings released in May 1933 showed the cab in a rounded nos similar to the "Railplane", wind tunnel tests conducted that summer at the University of Michigan under the directio of noted airship designer Ralph H. Upson resulted in an elevated cab behind a roun ed nose, resembling an inverted dirigible

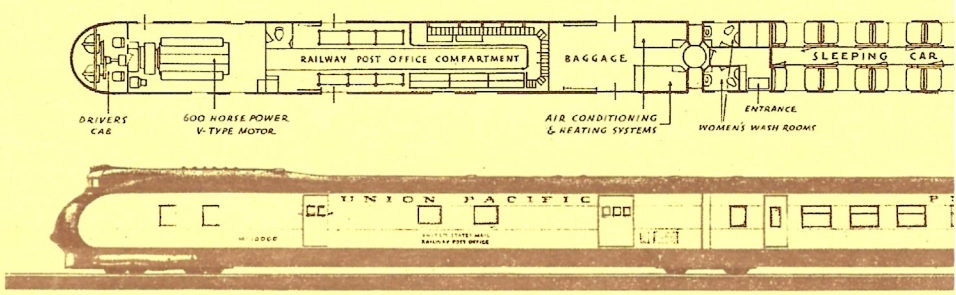
Following delivery on Monday February M-10000 made a whirlwind tour of the eas coast; was displayed at C&NW Station in Chicago along with the "Railplane" on



SCIENCE is the fundamental keynote of Chicago's Century of Progress Exposition of 1934. And, among the acres of floor space and ground space devoted to the purpose of depicting vividly how science has served the needs of man, Union Pacific's new train is a most significant exhibit. ● Its ultra-modern design and tradition-smashing type of construction is a tribute to the inventive genius of the leaders in the automotive, aeronautical and railway engineering fields. ● Recognized authorities in the aeronautical industry directed the wind tunnel tests which developed the design for this first fully streamlined train. Scientific studies proved that the use of an aluminum alloy was practical. The Winton Motors Company, a subsidiary of General Motors, developed the engine to fit the need. ● The entire train as it stands today, offers a graphic view into the future of railroad transportation. Everything about it is new, novel, practical. Everything suggests flashing speed and solid safety. It is truly "Tomorrow's Train—Today," a pioneering development that has marked the dawn of a new era in transportation progress.

THE TRAIN THAT HAS WRITTEN THE MOST COLORFUL PAG

SPEED with comfort, safety and economy of operating costs were the aims in the construction of Union Pacific's new train. Because of its radical departure from the conventional type of car and train construction, exhaustive tests were conducted during the development of every feature of the train to insure its perfection. The train is built entirely of aluminum alloys, one-third the weight of steel with the same strength. ● Its 600 horsepower, distillate-burning, 12 cylinder, V-type motor, directly connected to a generator provides the power to drive two 300 horsepower electric motors which propel the train. A dual system of super brakes and a number of other especially designed appliances insure perfect safety. ● Articulated construction—the cars hinged together with only one truck between each two cars—provides smoother riding at high speeds. Roller bearings and especially designed trucks improve riding comfort and eliminate noise. The train is fully air-conditioned—no dust, no dirt, no drafts, and maintains a comfortable, uniform temperature during the heat of summer and chill of winter. An indirect lighting system sheds a uniform light, without shadows or glare. The newly designed seats for 116 passengers in the two coaches assure utmost comfort. Individual trays are provided for each seat for meal service or writing purposes. Meals are prepared in the unique buffet-kitchen built into the rear of last car. ● The new type Pullman sleeping car is even more radically different in construction. Every berth, both upper and lower, has an individual washbowl and mirrored cabinet. Many new comforts and conveniences have been provided. Each seat has an adjustable arm rest. Windows are larger and provide an unobstructed view. Upper and lower berths in sections 1 and 2 are 6 feet, 9 inches long (6 inches longer than present berths) and were designed especially for tall persons. Aluminum louvre construction has supplemented the present-day curtains for sleeping car sections, and insures perfect ventilation in these air-conditioned cars. ● This train is not an experiment. During the early spring of 1934 it made a 12,625-mile test and exhibition trip from the Atlantic to the Pacific coast. (The Pullman car was not a part of the original three-car train which made this epochal trip.) It was exhibited in 68 cities in which 1,195,609 persons passed through to inspect its every feature. In addition hundreds of thou-



AMERICA'S FIRST FULLY STREAMLINED LIGHTWEIGHT HIGH SPEED TRAIN

Builder: Pullman Car & Manufacturing Corporation.
Dining car service is made of beautiful ware and aluminum. Its total weight is only 189 pounds, compared with the 530-pound weight of present dining car service.

The products of 66 manufacturing concerns were used and are a part of the construction of the new train.
Width is 10 inches narrower, roof is 3 feet lower, floor is 16 inches nearer rails, than on ordinary train.

Feb 23-24; and finally arrived on UP rails at Omaha February 25. Then came a UP system tour, arriving back in Omaha April 11. First revenue passengers were carried on an excursion sponsored by the Omaha Chamber of Commerce to Gering, Nebraska April 19.

M-10000 then returned to Pullman to have prototype streamliner sleeper "Overland Trail" inserted for display at the Century of Progress Exposition, this being completed May 23. This was done purely for display purposes, "Overland Trail" being removed and added to second streamliner M-10001 after exhibition.

M-10000 entered regular service on the 187 mile run between Salina and Kansas City as trains 99 - 100 on January 31, 1935. It departed Salina at 7 AM and arrived in Kansas City at 10:30; it departed Kansas City on the return trip at 4 PM and arrived back in Salina at 7:30. For a time, circa 1936-40, there was an additional midday round trip over the 68 miles between Kansas City and Topeka as trains 105 - 106. Originally listed in timetables as merely "The Streamliner", the name "City of Salina" was assigned March 13, 1936, when the "City" train fleet was on the verge of full scale expansion.

The original Winton model 191-A distillate power plant was converted to butane fuel in March 1939, and replacement with a new diesel power plant was later considered but discarded on grounds of cost-effectiveness. Nonetheless, the decision to retire the train appears to have been hasty. A foldout consist chart of the "City" fleet dated November 25, 1941, intended for public distribution and to remain current for a year, included the "City of Salina". However, it made its final run just three weeks later, on Tuesday December 16 (by coincidence, the Imperial Japanese Navy formally commissioned the largest battleship ever built, the "Yamato", on the same date, but American intelligence was unaware of its existence. Ironically, design work on this behemoth began in 1934). Of course, Pearl Harbor and the coming of war had its effect, but the handwriting appears to have been on the wall for the M-10000 for some time anyway.

What the coming of war <u>really</u> did was doom M-10000 to scrapping rather than historic preservation. UP president W. M. Jeffers had been placed in charge of the nation's rubber supply at the critical time when supplies of natural rubber from the Far East were cut off by the Japanese invasion, while our own synthetic production was barely getting started. This naturally made Jeffers even more scrap concious than most people at the time, since it was one of his duties to encourage the population as a whole to scrounge for all the scrap rubber it could lay its hands on to fill the critical gap until synthetic production was underway. Under the circumstances, it hardly seemed proper, if not downright unpatriotic, to sit on 90 tons of precious aluminum vitally needed for the war effort. So on Friday February 13, 1942, during the siege of Corregidor, eight years and one day after M-10000 was formally delivered at Pullman, the "wingless airplane" was sold for scrap, to be melted down to make winged airplanes that could carry the war to the far flung battlefronts.

Built as a cost of $230,997.00, M-10000 grossed $717,685.00 in revenues, so much more than paid for itself. As of December 16, 1941 it had run a total of 899,113 miles. In retrospect, it can be seen as a sensational, relatively simplistic attempt, typical of 1930's thinking, to accomplish what our enemies of the time accomplished in <u>real</u> terms with their "Shin-Kansen" ("New Line") bullet trains thirty years later.

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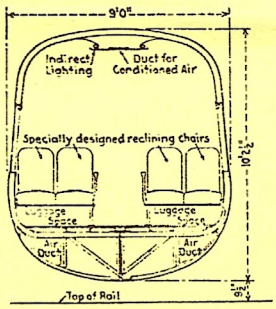
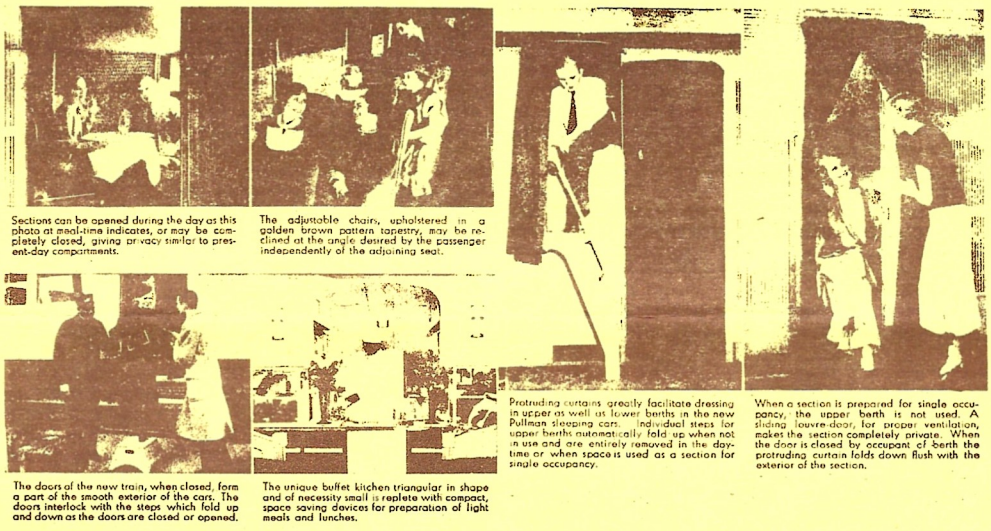


N TRANSPORTATION HISTORY

sands saw the exterior of the train only. Number 1 visitor was President Franklin D. Roosevelt. In the course of this historic trip, practically every kind of climatic condition was encountered. Temperatures varied from 10 degrees below zero to 92 degrees above. Snow, high winds, rain and dust storms provided unusual tests for the air-conditioning equipment. The train negotiated every sort of grade and curve from sea-level to altitudes of over 8000 feet. In special tests immediately following the epochal tour, a speed of 111 miles per hour was attained in the face of a 32-mile per hour head wind. At all times, under all circumstances, the super brakes and numerous other safety devices, in fact all the mechanical features functioned perfectly. ● This train is the first step in a pioneering program of rail transportation development. Union Pacific will soon place in service a 6-car train, including 3 Pullmans, between Chicago and the Pacific Coast. Two 9-car trains of similar design are also under construction and will be placed in transcontinental service immediately upon delivery. In its new, constructive program, Union Pacific is upholding a tradition as old as itself—*first with the finest in transportation facilities.*



Sections can be opened during the day as this photo at meal-time indicates, or may be completely closed, giving privacy similar to present-day compartments.

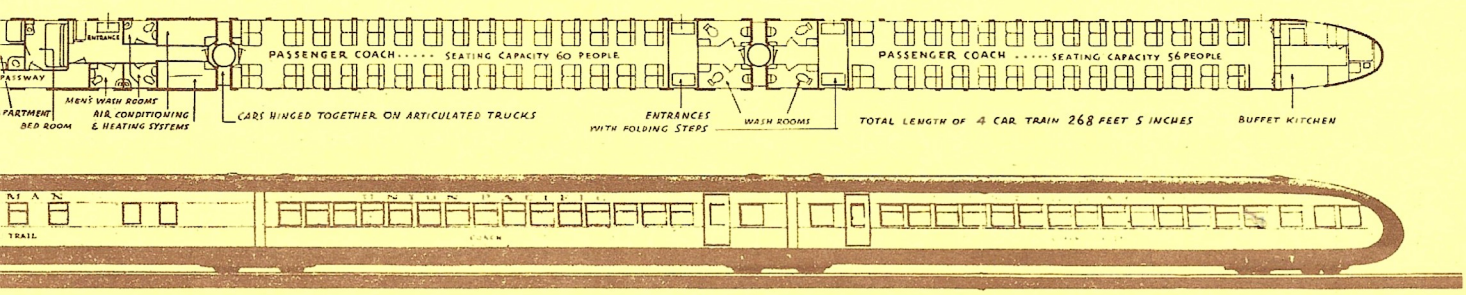
The adjustable chairs, upholstered in a golden brown pattern tapestry, may be reclined at the angle desired by the passenger independently of the adjoining seat.

The doors of the new train, when closed, form a part of the smooth exterior of the cars. The doors interlock with the steps which fold up and down as the doors are closed or opened.

The unique buffet kitchen triangular in shape and of necessity small is replete with compact, space saving devices for preparation of light meals and lunches.

Protruding curtains greatly facilitate dressing in upper as well as lower berths in the new Pullman sleeping cars. Individual steps for upper berths automatically fold up when not in use and are entirely removed in the daytime or when space is used as a section for single occupancy.

When a section is prepared for single occupancy, the upper berth is not used. A sliding louvre-door, for proper ventilation, makes the section completely private. When the door is closed by occupant of berth the protruding curtain folds down flush with the exterior of the section.



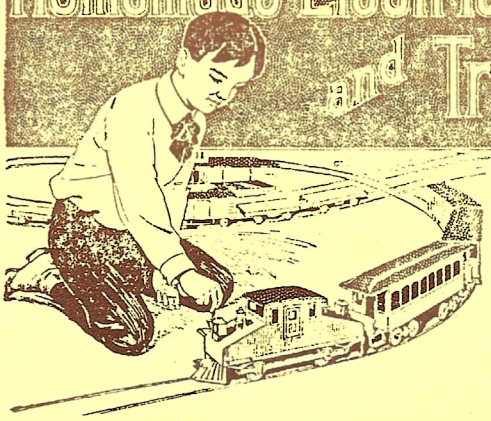
Low center of gravity of cars insures safety and comfortable riding at high speeds.
Front truck has 36-inch wheels, now standard for passenger trains. Remaining trucks have 33-inch wheels.

Engine burns distillate, a non-explosive fuel. Storage capacity enables train to travel 1200 miles without refueling.
Time required for station stops and inspection is materially reduced; switching entirely eliminated.

The train has two headlights, one horizontal, fog piercing light, the other a vertical light to identify the train at long distance.
Buffet-kitchen has oil-fired range and electric refrigerator.
The train has oil-fired heaters, with thermostatic control.

ALLIED MODEL TRAINS SPECIAL AUCTION. APRIL 1 IN OUR TTOS (MASONIC) HALL. ALLEN DRUCKER.

Homemade Electric Locomotive Model and Track System



By A. E. ANDREW

PART I—The Motor

THE electric locomotive described may be constructed by boys having average mechanical ability and the necessary tools. However, in any piece of mechanical construction care must be taken to follow the instructions. The material required is inexpensive, and the pleasure derived from such a toy is well worth the time used in its construction.

The making of the outfit may be divided into three parts, the first of which is the motor; second, the truck, which is to carry the motor and the body of the car, and third, the track system upon which the engine is to operate. A side view of the locomotive is shown in Fig. 1.

The motor is of the series type, having its field and armature terminals connected to the source of electrical energy through a special reversing switch. By this means the rotation of the armature may be reversed to make the locomotive travel forward or backward. The armature and field are constructed of sheet-iron stampings, riveted together.

The detailed construction of the armature and its dimensions are shown in Fig. 2. The shaft upon which the armature core and commutator are to be rigidly mounted is made of a piece of steel rod, 7/32 in. in diameter. A portion of this rod, 2¼ in. long, is threaded with a fine thread, and two small brass, or iron, nuts are provided to fit it. The ends of the rod are turned down to a diameter of ⅛ in. for a distance of ⅛ in. These are to fit in the bearings that are to be made later.

Cut from thin sheet iron a sufficient number of disks, 1⅛ in. in diameter, to make a pile exactly ⅝ in. thick when they are securely clamped together. Drill a hole in the center of each of these disks, of such a size that they will slip on the shaft snugly. Remove the rough edges from the disks and see that they are flat. Cut two disks of the same size, from a piece of 1/16-in. spring brass, and drill a hole in the center of each, so that they will slip on the shaft. Place all these disks on the shaft, with the brass ones on the outside, and draw them up tightly with the nuts provided. Be sure to get the laminated core in the proper position on the shaft by observing the dimensions given in the illustration, Fig. 2.

After the disks have been fastened, clamp the shaft in the chuck of a lathe and turn down the edges of all the disks so that they form a smooth cylinder, 1 1/16 in. in diameter. Draw a circle on the side of one of the brass disks, 3/32 in. from the edge, while the shaft is held in the chuck. Divide this circle into eight equal parts and make a center-punch mark at each division. Drill eight holes through the core lengthwise with a 3/16-in. drill. If the centers of the holes have been properly located, all the metal on the outside will be cut away, as shown in the end view, at the right in Fig. 2. The width of the gaps, F, G, H, etc., thus formed, should be about 1/16 in. Smooth off all the edges with a fine file after the holes are drilled.

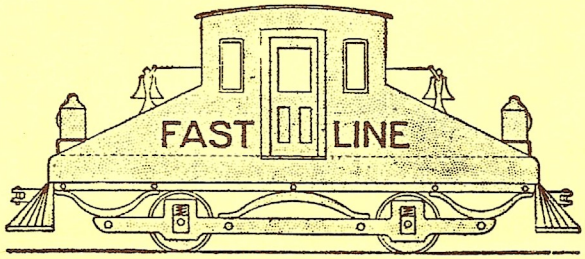


FIG. 1
Side View of a Locomotive Designed to be Operated with Either End Forward

A cross-sectional view of the commutator is shown at the extreme left, Fig. 2. It is constructed as follows: Take a rod of copper or brass, ⅞ in. in diameter, and 1¼ in. long; clamp one end in the chuck of a lathe. Turn the other end down to a diameter of ¾ in., and drill a ½-in. hole through it at the center. Cut away the metal from the end to form a disklike recess.

Cut off a disk, 5/16 in. thick, measuring from the finished end, from the piece of stock. Place this disk in a chuck, with the unfinished end exposed, and cut away the metal in a dish form, as shown at B. Cut small slots, into which the ends of the wires used in winding are to be soldered, as shown at 1, 2, 3, etc., in the right-hand view of Fig. 2. Obtain two brass nuts, about ¼ in. in thickness, and turn their edges down so that they correspond in form to those shown at C and D. Divide the disk ring, just made, into eight equal parts, by lines drawn across it through the center. Cut eight slots at these points, in the rim of the disk. These cuts should be through the rim. Fill each of the slots with a piece of mica insulation.

Place one of the nuts on the shaft, and then a washer of mica insulation, shown by the heavy lines, near A and B; then the ring, a second piece of mica, and last the nut, C. The latter should be drawn up tightly, so that the insulation in the slots in the disk are opposite the drilled slots in the armature core, as shown in the right-hand view of Fig. 2. After the disk has been fastened securely, test it to learn whether it is insulated from the shaft. This is done by means of a battery and bell, connected in series, one terminal of the circuit being connected to the disk, and the other to the shaft. If the bell rings when these connections are made, the ring and shaft are not insulated. The disk must then be remounted, using new washers of mica insulation. Mica is used because of its ability to withstand a higher degree of heat than most other forms of insulation.

Each of the eight segments of the dished disk should be insulated from the others. Make a test to see if the adjacent commutator segments are insulated from each other, and also from the shaft. If the test indicates that any segment is electrically connected to another, or to the shaft, the commutator must be dismantled, and the trouble corrected.

The armature is now ready to be wound. Procure ⅛ lb. of No. 26 gauge insulated copper wire. Insulate the shaft, at E, with several turns of thin

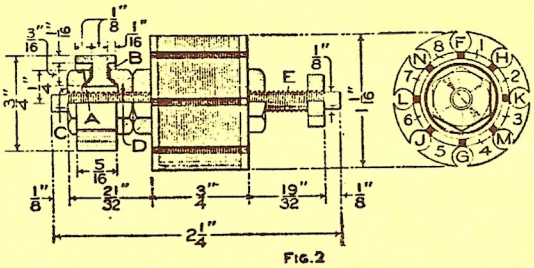


FIG. 2

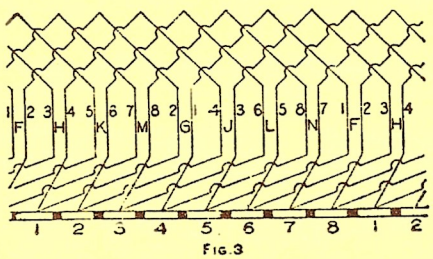


FIG. 3

How the Armature Core is Made of Soft-Iron Disks for the Lamination, at the Left. Diagram for the Winding of the Armature Coils and Their Connection to the Commutator, at the Right

cloth insulation, and also insulate similarly the nuts holding the armature core and the inside nut holding the commutator. Cut several pieces from the cloth insulation, wide enough to cover the walls of the slots in the core, and long enough to extend at least 1/16 in. beyond the core at the ends. Insulate slots F and G thus, and wind 15 turns of the wire around the core lengthwise, passing the wire back through the slot F, across the back end of the core, then toward the front end through slot G, and back through F, and so on. About 2 in. of free wire should be provided at each end of the coils.

In passing across the ends of the armature, all the turns are placed on one side of the shaft, and so as to pass on the left side, the armature being viewed from the commutator end. The second coil, which is wound in the same grooves, is then passed on the right side, the third on the left, and so on. After this coil is completed test it to see if it is connected to the armature core. If such a condition is found, the coil must be rewound. If the insulation is good, wind the second coil, which is wound in the same slots, F and G, and composed of the same number of turns. Insulate the slots H and J, and wind two coils of 15 turns each in them, observing the same precautions as with the first two coils. The fifth and sixth coils are placed in slots K and L, and the seventh and eighth, in slots M and N.

The arrangement of the half coils, slots, and commutator segments is given in detail in Fig. 3. Each coil is reduced to one turn in the illustration, in order to simplify it. From an inspection of this diagram it may be seen that the outside end of the second coil in the upper row of figures, at the left end, is connected to the inside end of the fourth coil at segment 1, in the lower row of figures, representing the segments of the commutator. The outside end of the fourth coil is connected with the inside end of the sixth coil, at segment 2; the outside end of the sixth coil is connected with the inside end of the eighth coil at segment 3; the outside end of the eighth coil is connected to the inside end of the coil 1 at segment 4; the outside end of the coil 1 is connected to the inside end of the coil 3 at segment 5; the outside end of the third coil is connected to the inside end of the fifth coil at segment 6; the outside end of the fifth coil is connected to the inside end of the seventh coil at segment 7; the outside end of the seventh coil is connected to the inside end of the second coil at segment 8, and the outside end of the second coil is connected to segment 1, completing the circuit.

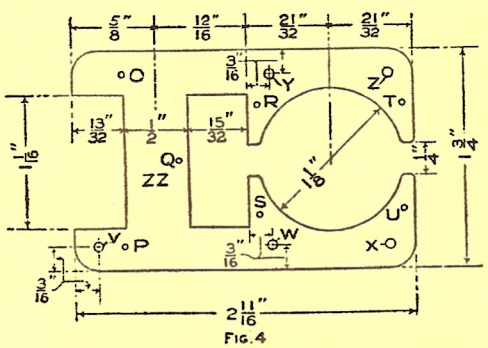


Fig. 4

Pattern for the Field Stampings, Several Pieces being Used to Make the Desired Thickness

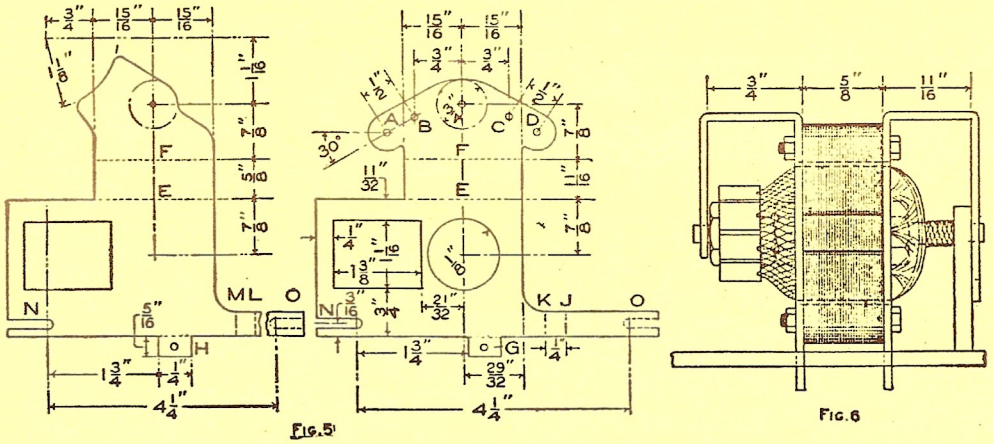


Fig. 5

Fig. 6

Detail of the Field-Structure Supports, One Being for the Left Side and the Other for the Right. The Supports are Shown in Place at the Right

The dimensions and form of the field stampings are given in Fig. 4. A number of these cut from thin sheet iron to make a pile 5/8 in. thick when clamped together is needed. The dimensions of the opening to carry the armature should be a little less than that indicated in the sketch, as it will be necessary to true it up after the stampings are fastened together. Use one of the stampings as a pattern, and drill seven small holes in each, as indicated by the letters O, P, Q, R, S, T, and U. Fasten them together with small rivets, and true up the opening for the armature to a diameter of 1 1/8 in. Drill five 1/8-in. holes, as indicated by the letters V, W, X, Y, and Z, to be used in mounting the pieces, which are to form the armature bearings, brush supports, and base of the motor.

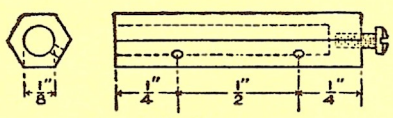


Fig. 7

Detail of the Brush Holders, One Inch Long, with Holes as Shown

Continued on page 8

Cut two rectangular washers from a piece of thin fiber insulation, with outside dimensions of 1 1/8 in. and 1 1/4 in., and an inside opening, 1/2 in. by 5/8 in. Cut open these washers and slip them in position on the portion of the field marked ZZ. Wrap two turns of the cloth insulation about this part, which is to form the field core, and wind the space full of No. 18 gauge enamel-insulated copper wire. Give the completed winding a coat of shellac. The terminals of this winding should be brought out through two holes drilled in one of the fiber washers, one near the core and the other near the outer edge. It is better to have the field terminals at the lower end of the part ZZ than at the upper end.

Now cut two pieces from 1/16-in. sheet brass, similar to those shown in Fig. 5. Place them on opposite sides of the laminated field structure, shown in Fig. 4, and carefully mark the position of the holes, V, W, X, Y, and Z, as indicated in Fig. 4, and drill 1/8-in. holes, where the marks were made. Lay out and drill 1/8-in. holes, A, B, C, and D, Fig. 5. Bend the upper portion of the pieces at right angles to the lower portion, along the dotted lines E, and then bend the end of the horizontal portions down along the dotted lines F, until they are parallel with the main vertical parts of the pieces. The latter should be bent so that one forms the left support and the other the right, as shown in Fig. 6.

Bend the projections G and H at right angles to the vertical main parts. The parts at the bottom are bent, one back along the dotted line J and forward on the line K; the other forward on the line L and back on the line M. The pieces are then mounted, on the side of the field structure, as shown in Fig. 6. The supports are fastened in place with five small bolts. The grooves N and O, in Fig. 5, are used in mounting the motor on the axles of the truck. They will not be cut until after the truck is constructed.

The brush holders are made of two pieces of hexagonal brass, each 1 in. in

Continued from page 3

Personal Affairs

FORBES, DECEMBER 19, 1983

through 1936 can fetch up to $2,000 each. American Flyer's "Planter's Peanut Box Car," made in 1961, is one of the rarest AF items. Only a couple are known to exist, and one of them can sell for as much as $4,000.

You can get a line on how much your trains might be worth by consulting one of several price guides. The pocket edition of *Greenberg's Price Guide to Lionel Trains* costs $5.95 and lists all major Lionel items made since 1901 (Greenberg Publishing Co., 729 Oklahoma Road, Sykesville, Md. 21784; add 75 cents for postage).

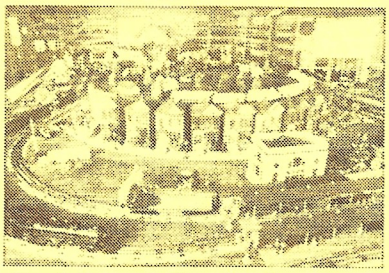
Although Lionel has been synonymous with toy trains, it was Cincinnati-based Carlisle & Finch that began mass-producing electric trains in the late 1890s. Märklin, the premium German toymaker that still produces upmarket toy trains, turned out wind-up versions as long ago as 1859.

At one point in the Fifties, model trains was the largest single category of toys in the U.S. toy industry. Railroad executives would court Lionel and A.C. Gilbert to get their road names on the toys. But like their real-life counterparts, model railroad makers are hurting these days. Sales of toy trains fell another 15% last year, to $117 million at wholesale.

For serious hobbyists, though, their appeal never flags. "Nobody doesn't like a train," insists Charles Sandersfeld, president of Illinois-based Omnicon Ltd., a designer of trade show exhibits and a train buff. "You can be a master builder, an electrician, a carpenter or just an operator. This hobby accommodates all those skills."

And it does what a good hobby always does—refresh. "I used to have a lot of trouble sleeping at night because of the mistakes I made at work," says Larry Sokol, who specializes in personal injury law. "Now, instead of thinking about what doctors I should have sued, I think about building another boxcar for my layout. It's good for my sleep."

Young at heart



Frank Sinatra's Lionel trains
A stop in Hoboken.

Few model railroaders have the opportunity to indulge their passion to the extent Frank Sinatra does. Old Blue Eyes has housed his huge collection of Lionel and other trains in an old-style train station built on his estate in Palm Springs, Calif., where he also installed a full-size caboose. Sinatra's multilevel, 20-foot layout boasts mountains, bridges, model planes hanging from the ceiling and a row of brownstones in the manner of Hoboken, N.J., his birthplace.

"The trains bring back memories of my childhood because I lived near the railroad yards," he told FORBES. "I used to spend hours and hours watching the trains go by. I got a special kick out of it."

It's that childhood fondness for trains that led him to begin collecting them many years ago and that also created a preference for train travel. "In spite of having our own airplane," he says, "I delight in traveling by train whenever I can."

Between concerts and records these days, the 68-year-old Chairman of the Board finds that "taking care of the collection, showing it to friends and merely looking at it in quiet moments are wonderful for relaxing."—J.A.B.

Frank Sinatra, TTOS #5455, has provided us with dozens of photographs of his layout. Look for an article in the TTOS Bulletin this year.

HOT BOX AD

FOR SALE: Lost lease: vast amount of standard gauge blue comets, 392E, 390E, 385, 1835, 384, 402, 42, 8's, 10's, No. 6 set, passenger cars, 200-500-100-10 series freight cars. Miles of pre-war "O" gauge. Postwar Hudson set, General Set, Presidential, Congressional and 50th Lionel Anniversary Sets. All the FM's. Too much to list. Accessories. Most pieces boxed. Bob Topley. 1344 W. Washington Blvd., Venice, CA.

Continued from page 7

length, having a ⅛-in. hole drilled in one end to a depth of ⅞ in., and a threaded hole in the other end, for a small machine screw, as shown in Fig. 7. Two holes are drilled and threaded in one side of each of these pieces. These holders are to be mounted, by means of screws, through the holes A, B, C, and D, Fig. 5. Each holder must be insulated from its support. The distance of the holder from its support should be such that the opening in its end is in the center of the commutator. The brushes are made of very fine copper gauze, rolled to form a rod. They are made long enough to extend about ½ in. into the holder, when they are resting on the commutator. A small spiral spring is placed in the holder, back of the end of the brush, and which will serve to keep the latter in contact with the commutator.

Temporary connections are made and the motor is tested with a six-volt battery. The construction of the motor may be modified as to the length of shaft, and other minor details, and may be used for other purposes by fitting it with pulleys, a countershaft, or other transmission devices.

TO BE CONTINUED NEXT MONTH WITH PART II: CONSTRUCTION OF THE LOCOMOTIVE

MARCH EVENTS

MARCH 2 TTOS GOLDEN STATE DIVISION IN SAN JOSE. BARBARA JONES FOR INFO: (408) 257-9385.

MARCH 3 TTOS SACRAMENTO MEET. TOM GIBSON, PRES. (916) 421-2452.

MARCH 9 TTOS SOUTHWESTERN MONTHLY MEETING. USUAL PLACE & TIME. BRING A JOINER. BRING TRAINS.

MARCH 17 SPECIAL BIG MEET OF OUR NEW TTOS SILVER STATE DIVISION IN THE LAS VEGAS BINGO PALACE. SATURDAY 1-6 P.M. $5 PER TABLE. CALL JACKIE REELEY (702) 645-1321. LET'S GO. WE'RE WANTED. BRING TRAINS & MONEY.

MARCH 23-25. CAL-STEWART MEET IN SANTA CLARA. INFO: DON CHURCH (415) 444-3282. A BIGGIE.

MARCH 25 TTOS S.P. MEET IN ANAHEIM. INFO: STEVE LATTA, (714) 745-5011.