TEST LABORATORY IS WONDER PLANT

Spectacular Part in Frisco Efficiency Played by Springfield Test Department

IT WAS back in the day when iron horses were but two-thirds grown iron colts. A locomotive was toiling jerkily down a stretch of Frisco Lines. Gradually, its eccentric speed lessened; it faltered once or twice, then stopped altogether. A thoroughly disgruntled engineer spat a string of powerful expletives into the already blue air of the cab and concluded his oration with:

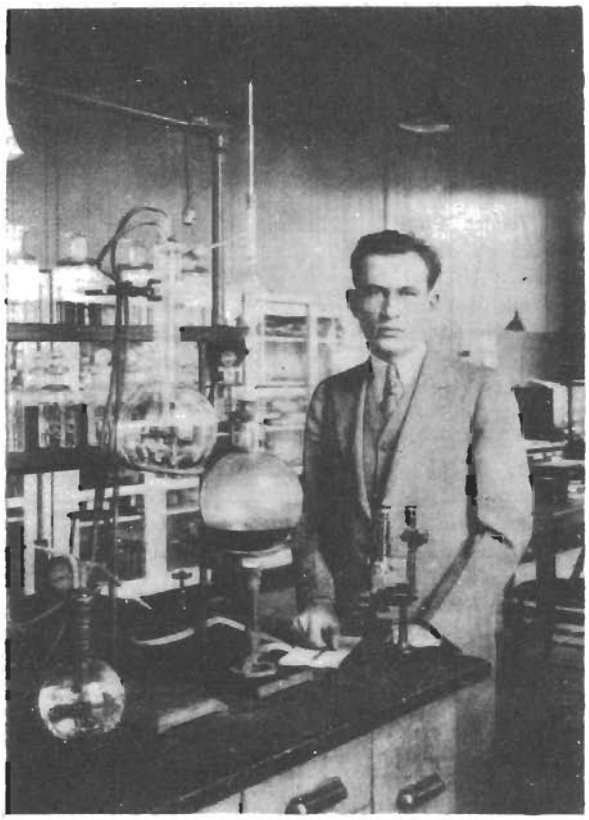
"It's that bum coal again!"

The little drama just recounted belonged to an era which closed on Frisco Lines in 1912, when the Frisco's materials testing laboratory came into existence. Roles similar to the one played by inferior fuel in the incident of the pretest age, related above, were frequently taken by any of several materials, such as low-grade steel, poor lubricating oil or what not.

Today, the story is different. Engine failures or any other failures occasioned by mediocre materials occur on Frisco Lines with about the same frequency that porters refuse tips, and a large share of the credit for this belongs to the materials testing laboratory which has grown from an inauspicious beginning in St. Louis until today, with its modern scientific equipment it occupies about 3,300 square feet of floor space or the greater part of the second floor in the West Shops Store Building at Springfield and normally requires the services of six technically trained men.

For the important task of testing the supplies that are bought, Frisco Lines has done a thoroughgoing job of outfitting this department, because a purchase by Frisco Lines is more than a matter of just placing an order for the amount of material needed. Before a decision is reached, samples are secured from the various supply companies and sent to the laboratory for careful analysis and trials and the material that most economically meets specifications is chosen. This department performs numerous other functions and complete equipment is provided for them also.

One enters the laboratory through a door at the northwest corner of the large room in which most of the physical tests—i. e. tests of resistance to wear, pressure, light, etc.—are made. What an array of scientific apparatus greets the eye! Along the north wall is a row of glass-encased scales, each delicate enough to accurately determine the weight of a pencil mark upon a piece of paper. Out in the center is a barrel-shaped device, known as a Fade-Ometer, which artificially produces the effect of sunlight and is used for trying inks and fabrics. Over in a corner is a device called a supercentrifuge which separates solids from liquids in paints and other substances when other means fail. The bowl of this machine makes forty thousand revolutions a minute at full speed and emits a sound very similar to a fire siren. Near it is a calorimeter for measuring the heat value of fuel. There is also a viscosimeter for determining the body of oils. This device is equipped with a heat control panel that will hold the temperature at any given setting. The panel was designed and constructed by the Frisco's own scientists right there in the laboratory.



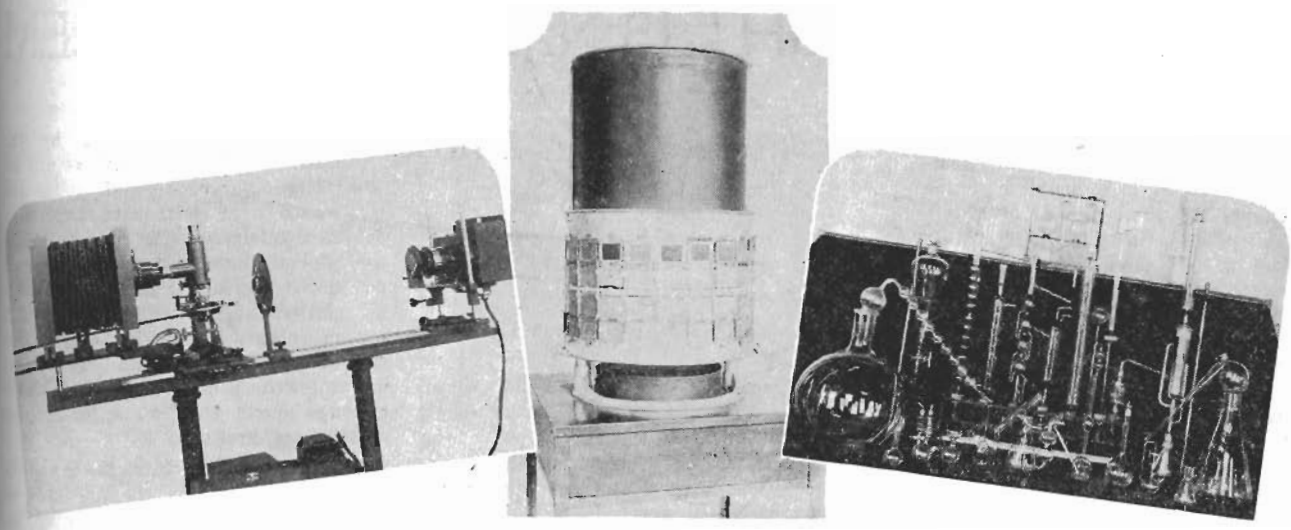
M. A. HERZOG

So much for a few of the devices in this one room. Adjacent to it on the west is a smaller room in which photographic supplies are kept. In addition to regular picture-making furnishings, in this room is found a remarkable instrument, spoken of as a metallographic camera, and it is useless for a sample of material to try to keep secret even the most minute defect when it is put into this camera, because it magnifies up to 1,500 diameters and photographs the magnified object.

Joining the large room which is used chiefly for physical tests at the east is a samples preparation room, equipped to cut samples of steel or any other substance to any size or shape desired.

To the east of the samples preparation division and running the width of the building is the room in which the greater part of the chemical analysis is done. Here are found chemical glassware in all shapes, large supplies of chemicals, electric furnaces which develop up to 1,800 degrees temperature, torches, a distillery for preparing distilled water and a wide variety of other necessities to the chemist's craft. In a safe in one corner of the room are kept the rarer chemicals and among other things several small dishes and crucibles of platinum valued at around $500. These are required in handling chemicals that attack even glass and porcelain. There are also silver dishes.

Out in the locomotive shop is an especially spectacular machine that is used by this department. It is called the Universal Testing Machine and is used in determining the tensile strength and the compression resistance of materials. A piece of boiler tube about four inches in diameter and with walls about three-eighths of



The mysterious piece of apparatus at left above is the test laboratory's metallographic camera which can magnify samples of material up to fifteen hundred diameters and then photograph them. The barrel-shaped device in the center is a Fade-Ometer which artificially produces the effect of sunlight upon fabrics, inks, etc., and the photograph at the left shows a miscellaneous assortment of chemical glassware which illustrates the wide variety of equipment necessary in a test department.

an inch thick is pancaked by this machine just as one depresses a collapsible opera hat. And small wonder, because it can exert 250,000 pounds of pressure and can pull just as hard.

The man who presides over this magic realm of glittering test tubes, beakers, retorts and hardness testing devices, polishing machines, acids, metals and formulas is M. A. Herzog, chief chemist, who has been with Frisco Lines eleven years. He is a graduate with a Bachelor of Science degree in engineering chemistry from the Georgia School of Technology at Atlanta.

It would be difficult to give even a bare list of all the work this scientist and his corps of assistants do. Doubtlessly, it can be said that their chief province is to see that supplies purchased meet specifications and many of the specifications they themselves have worked out. One in which Mr. Herzog takes particular pride is a micro-structure requirement for locomotive forgings which they have perfected, not being content with merely seeing that forgings meet the usual physical and chemical specifications.

Sometimes the members of this department are called upon to effect a saving even greater than can be made by recommending the cheapest dependable materials for sale. For instance, they were called upon to work out a formula for a car renovator and car cleaner and they did so, effecting a saving of approximately $875.00 a month.

Elimination of waste is another major task. An example which serves to demonstrate the work of the laboratory in this field is the utilization of the bits of gilt paint that fall from brushes in painting numbers, etc. on coaches. To the uninitiated, these dried bits are but so much waste paint, but Frisco Lines preserves them carefully and sends them to the laboratory, because to the company "thar's gold in them scraps." The scientists there take this waste and with their facilities separate the precious metal it contains, molding it into bars of solid gold from which the company realizes neat sums.

Among other duties, the laboratory assists various departments. The industrial department sends in samples of ore found in Frisco territory to determine their value. The claim department calls upon it to help clear claims by scientifically giving the cause, extent and responsibility of damage. A machinist breaks a tool and his foreman looks at it and says, "That tool shouldn't have broken. We'll send it to the laboratory." Bridge steel is tested by it. The stores department sends many items. Among the various things the records showed had been tested there recently, were: pipe fittings, brake shoes, an air strainer for a locomotive air compressor, dry batteries, safety goggles, torch wicking, sand and electrical conduit.

Thus, day by day the materials testing laboratory is quietly doing things of a highly spectacular nature that Frisco Lines may carry its passengers with easy speed and safety and its employes may perform their work safely with proper equipment.

How many traffic tips did YOU send in this month?

FREIGHT ERRORS REDUCED

Seventy-three fewer errors were made in handling shipments on Frisco Lines during February than in the preceding month, according to a report issued March 10 by J. L. McCormack, superintendent of freight loss and damage claims, Springfield, Mo. Errors during February totaled 292 and during January a total of 365 was made; however, the January total was 87 errors under the number made in December.

Tulsa won the Group One pennant during February, making the fourth consecutive month that station has had the fewest errors of any in the group. Four errors were made there in handling 20,419 shipments. Kansas City was second in the group, handling 24,003 shipments with twenty-six errors, and St. Louis Seventh Street Station was third, making 58 errors in handling 33,608 shipments.

In Group Two Birmingham had the best record during February and retained the pennant of the group during March. This station has won the pennant three consecutive months. Thirteen errors were made there during February in handling 12,959 shipments.

In Group Three, Hugo and Chaffee had perfect records. The pennant was held at Wichita during February and was sent from there to the agent at Chaffee where it was held two weeks and then sent to Hugo for the remainder of the month. A total of 2,509 shipments were handled at Hugo and 2,148 at Chaffee. Fort Smith was third in Group Three, making five errors in handling 3,661 shipments.

RAILROAD PLIGHT IS NATION'S PROBLEM

Declares Revenues Must Be Increased to Save Carriers

By JOHN T. FLYNN
Associate Editor of Collier's Weekly

Collier's Weekly takes up the cudgels on behalf of the railroads in a comprehensive leading article published in its issue of April 4. The following extract from Mr. Flynn's vigorous and significant picture of the present situation shows why the present plight of the railroads must be regarded as a major national problem. "The fact is," declares Mr. Flynn, "that these great arteries of commerce and travel are essential to the convenience and welfare of the country, and the nation cannot afford to see them financially crippled."

THE saving of the railroads is a major national problem. It is a problem which affects the investments of a million people, the jobs of a million and a half men and women directly and as many more indirectly, and the servicing of countless industries which cannot otherwise exist. It ought to be dealt with in calmness, not passion; with the head and not with the heart and tongue.

Generally speaking, everyone is using the railroads less than they used to. There are so many alternatives nowadays — automobiles, waterways, trucks, busses, airplanes, pipe lines. These alternatives are cutting into the business of the railroads. What can be done about it?

Commodore Vanderbilt and Jay Gould were once arguing about railroads, Jay Gould had a little education but the Commodore had none. Gould kept speaking of "Our transportation system," and the problems of "transportation."

"Stop saying 'transportation,'" commanded the imperious old Commodore. "Say 'railroads.' Transportation means railroads in this country."

At a somewhat later day, Alexander J. Cassatt, famous railroader, said: "We may make bigger engines or different engines. We may change our form and method. But one thing we know and that is that the railroads are and will always remain our one real system of transportation."

Most people think that today. Will they be surprised when they are told that out of every ten persons who travel in this travel-crazy age only one travels on a railroad train?

It is just one hundred years ago this year that the De Witt Clinton, the first regularly-commissioned steam locomotive, was put into service on a railroad in this country. One might suppose this centennial year would be one of joyous commemoration. But the railroad presidents celebrated it by getting together in a body, opening up their tear ducts and lifting their voices in lamentation. Is there really anything the matter with the railroads? Net earnings were higher in 1929 than any year in history—almost $100,000,000 more than the year before and $200,000,000 more than 1925. In 1921 the rate of return to railroad owners was only 2.84 per cent. It increased every year until in 1926 it was 4.98 per cent. There was a brief set-back but by 1929 it was up to 4.95 per cent. Of course this was the average. The bigger and more prosperous roads did much better.

Then suddenly we began to hear that these railroads which we thought were doing so well were in a very serious trouble. Throughout 1930 there had been a serious drop in traffic and earnings. Railroad traffic last year was 6,000,000 freight cars less than 1929. Railroad gross revenue was $600,000,000 less. The rate of return on property investment was only 3.41 per cent. Why did the roads do so poorly in 1930 and so well in 1929? There was bus and motor coach and waterway competition in 1929. The answer to that question constitutes one chapter in railway history for which the railroad managers must be given the very greatest credit. Railroad net earnings grew from 1921 to 1929, but an odd feature about this is that gross earnings declined right along. The roads took in less money in 1927 than in 1926; they collected even less the next year, 1928. In that year their revenues were almost $300,000,000 less than in 1926. They increased in 1929 a little but were still under 1926. In spite of that the railroads increased their profits each year by the simple process of decreasing their expenses. This was accomplished by the most determined, ruthless and intelligent drive on inefficiency and waste ever witnessed in American business. Every man employed accounted for a great deal more work. Bigger locomotives pulled bigger freight cars with more cars to a train. Back in 1923 the average freight car moved 6.4 miles an hour. But in 1930 the average speed was 13.1 miles an hour —twice as great.

By dealing with intricate problems of operation, cutting corners here, reducing wastes there, speeding up, improving equipment, the roads have been able to haul roughly 20 per cent more traffic with 20 per cent less operating expenses. Thus in 1929 the railroads actually took in $113,000,000 less than in 1928 and made $40,000,000 more in profits.

All this was a gain for the railroads, of course. But it was also a gain for general business. There is indeed no way of telling just how much this meant in dollars and cents to American business. First of all, to make this possible the railroads have spent in the last eleven years more than eleven billion dollars in new road building, new locomotives, new equipment of all sorts and these huge expenditures played no small part in the general prosperity which the country enjoyed at that time. But the savings to individual businesses were even more marked and more important. Thus on the side of earnings and operating results the railroads made an extraordinary record up to the end of 1929. But now you will see why the railroad presidents have become frightened. All this time gross railroad revenues had been decreasing. The roads made their good showing by cutting operating costs more rapidly than gross income declined. Now the railroad managers say operating expenses cannot be cut any more. The process has progressed to a point where further savings can be effected only at the expense of service. If revenues go on decreasing, while expenses remain stationary, the railroads will move into the red. Some of them will face bankruptcy.

What is to be done? Revenues must be increased. This must be done either by getting more business or getting higher rates. And both of these objects seem to be cluttered up with almost insuperable obstacles.

What has become of all this rail-l traffic which the roads have n losing? Back in 1920 the roads k care of 47,250,000,000 passenger es. In 1929 they took care of 31,-000,000 passenger miles. They e lost a third of their passenger iness.

Where has this passenger traffic e? The busses have not gotten, long hauls, more than 2,500,000,000 senger miles. In other words, at most, they have gained about one-h what the railroads have lost. at has become of the other five-ths? There is only one answer. is the private automobile. There 24,000,000 private automobiles in United States. If each car in a r traveled 520 miles with a single senger in it outside its ordinary n driving, the loss in railroad el could be accounted for.

What can the railroads do about ? They demand that automobile ses be brought under regulation by Interstate Commerce Commission as the railroads are. Above all railroads want these two pro-ions:

First, that no bus line be permitted operate unless authorized to do by the Commission.

Second, that busses and all automo-s be taxed to pay their full share the cost of constructing and main-ing the highways which the auto-iles use.

But it is pretty obvious that even the railroads were to eliminate all passenger busses they would not e reached the real cause of their of traffic. Their real, effective is the private car. It is not a mon carrier. It cannot be regu-d by the Interstate Commerce mission. There is almost no way reaching it with regulation which drive motor car users off the pub-highways and into the passenger ches of railroad trains. The prob-is a baffling one.

all this has to do with passenger fic. Competition between rail-ds and trucks for freight traffic is ething entirely different. Eighty-per cent of all trucks are owned shippers—manufacturers and mer-ants—who use them entirely to nsport their own goods. Another per cent belong to contractors who their vehicles out to shippers. 93 out of every 100 trucks can-be considered as common carriers cannot be regulated by the Inter-te Commerce Commission. Never-less these trucks take enormous nts of freight away from the roads. For 40 years railroad traf-had been increasing around 80 per cent every decade. From 1920 to 1930 it increased only eight per cent. This is not because there was a smaller increase in traffic. Quite the contrary. But more than 90 per cent of the increase went to trucks and other forms of transportation. It is difficult to estimate how large this freight traffic carried by trucks is.

It is not easy to say what the railroads can accomplish against the truck. However, there is an incessant campaign in progress in most states to regulate trucks, to fix maximum sizes, to limit speed to 35 miles an hour, to limit loads, to increase taxes and to compel owners to conform to more rigid rules in treatment of employees.

As one follows these matters one gets the impression that economic law is swatting the railroads in many places. For instance, pipe lines. Gas is brought in pipes from Texas, Oklahoma, Kansas, Louisiana to St. Louis, Kansas City, Memphis, New Orleans, Denver, Salt Lake City, San Francisco and countless other towns in between. Of course these pipe lines don't take any traffic directly from the railroads. But they put an end to coal consumption where they bring gas and thus knock into a cocked hat one of the most important traffic divisions of the carriers.

This is not the whole story. Gasoline transportation by pipes threatens to take actual freight business away from the roads. One rail executive insists that this is the most serious menace the roads face. The roads own some 285,000 tank cars and this business brings them a revenue of about $380,000,000 a year.

The situation is a difficult one. There are two sides to every one of the proposals which the railroads advance. But after you say that, you still have on your hands the fact that these great arteries of commerce and travel are essential to the convenience and welfare of the country and the nation cannot afford to see them financially crippled.

Opera Star on Texas Special

GRACIOUS and smiling, Miss Martha Atwood, soprano of the Metropolitan Opera Company, stepped aboard the Frisco's Texas Special at St. Louis on Friday night, March 13, for a trip to Dallas, Texas, where she will appear with the Dallas Symphony Orchestra.

"They wanted me to come by airplane," she said, "but I prefer the luxurious appointments of a train, which I consider the next thing to a home on wheels."

She smilingly consented to pose for a picture and as she stood in the vestibule, she said that she was anticipating a lovely meal on the Frisco diner as well as a lovely trip to Dallas.

"This spirit of friendliness which prevails in having guests on your trains met by some member of your traffic department is a wonderful thing. It gives the guest an idea that she is indeed welcome and that her comfort is paramount.

"Although I have never been on your Frisco train I know now that I am going to enjoy my trip, for I am going to thoroughly relax, in anticipation of my strenuous day on Sunday, March 15, when I shall sing in the afternoon and leave on an evening train.

"Were it not for the luxurious appointments of trains, such as yours, and the courteous and willing service rendered by your traffic departments and your train crews, these hurried trips would be quite trying, but as it is, I am thoroughly enjoying my trip."

SPRINGFIELD AND ST. LOUIS WIN MEET

Second Annual Frisco Bowling Tourney in Springfield, February 21-23, Draws 110 Pinmen

TOP places in the four divisions of the second annual Frisco System Handicap Bowling Tournament, held in Kline's Alleys, Springfield, Mo., February 21, 22 and 23, were split evenly between a Springfield and a St. Louis team.

The Springfield five, known as the St. Louisans, battled its way to first place in the team competition with W. A. Mongold, one of its members, copping the all-event championship. H. E. Martin and E. W. Gatzert of the St. Louis Memphian team made the high doubles score and Ralph McBride of the same team was first in the singles. Approximately 110 Frisco pinmen, representing St. Louis, Kansas City, Tulsa and Springfield, assembled at the alleys to take part in this tourney.

The Springfield St. Louisans, in winning the five-man team competition, tormented the pin boys to the tune of 2,627 pins in three games, which, with a handicap of 120, gave them 2,747 for a grand total and $41.22 in prize money. This five grabbed the lead in the first day of the tournament, piling up their total the evening of February 21 and it stood throughout the remainder of the competition. The team was comprised of the following: H. E. Brown, captain; E. E. McMahan, W. A. Mongold, James W. Adams and H. T. Palmer. Mongold, star mineralite wielder of this quintet, in winning the all-event competition, made a grand total of 1,918 which included a 207-pin handicap. First prize in that division was $8.25.

Martin and Gatzert, the sharpshooting pair from the St. Louis Memphian team, who took first prize in the doubles made a grand total of 1,238 in three games with a handicap of 135. First prize in that event was $20.61. Their score was made on the second day of the tournament. McBride, another star of the Memphian five, won the singles with a grand total 30-frame score of 676 which included a handicap of 84 pins. He was awarded $12.36 for his efforts.

Prizes were awarded for the first five places in each event. The Ozark Special team of St. Louis took second place in the five-man competition with a three game grand total of 2,744, just three pins under the high, made by the Springfield St. Louisans. As a matter of fact, the first three places in this division were all decided by narrow margins, the Springfield Governors taking third with a grand total three-game score of 2,738. The Ozark Special team used a handicap of 111 and received $25.76 as a prize for its showing. It was comprised of C. G. Lamont, captain; E. H. Thielker, J. B. Tremayne, R. L. Carr and J. A. Kilker. The Governors' handicap was 213 pins and third money in this branch of the tourney amounted to $15.46. On this team were C. P. King, captain; E. M. Carr, G. L. Davis, C. J. Stephenson and W. D. Steele. Fourth and fifth places were each awarded $10.30. The Springfield West Shops team won fourth place with a grand total three-game score of 2,720. Their handicap was 294 pins. Following are the members of that quintet: W. Hamilton, captain; E. King, Bunch, Cook and Conn. Fifth place went to the St. Louis Terminals Nighthawks, who made a total in three games of 2,640 including a 201-pin handicap. This team was captained by J. L. Cunningham. The other members were T. O'Toole, C. E. Stookey, Wm. Bedford and F. Spinner.

Ralph McBride, stellar bowler of the St. Louis Memphian team, who captured top honors in the singles at the second annual Frisco Bowling Tournament.

Claude Harris and Clarence Pierce, stellar maple men from the Springfield Sunnyland team, piled up a total of 1,223 in three games to cop second in the doubles. Their handicap was 159 and the second prize in this event was $12.88. The Springfield St. Louisans again made themselves felt in the tournament when two of their bowlers, McMahan and the invincible Mongold, took third in the doubles. Their three-game total was 1,2[illegible] which included a handicap of 1[illegible] Third prize was $7.73. H. Seimer and Fred Rose of the St. Louis Sunnyland team were fourth in the doubles with a grand total of 1,200, which included 105 pins as a handicap. They received $5.16 as fourth prize. Fifth place in the doubles was won by W. G. Baxter of the Blue Bonnet team from the reclamation plant at Springfield and Conn from the West Coach Shops team. Their three-game total was 1,198 which included a handicap of 198 pins and the prize for fifth place in the doubles was $5.15.

Second place in the singles was won by F. Littrell of the Springfield Blue Bonnet team. Littrell's grand total 30-frame score was 667 and his handicap was 201 pins. He received $7.73 as second prize for the event. Third place was taken by E. A. Mayabb of the Springfield Meteor team. He piled up a 30-frame total of 6[illegible] using a handicap of 135. Mayabb received $4.64. F. Spinner of the St. Louis Terminals Nighthawks scored 660 in three games, using a 30-pin handicap to take fourth place for which he received prize money amounting to $3.09. Mongold, who placed in every event of the tournament, was fifth in the singles, making a 30-frame grand total of 653 which included a 69-pin handicap. He likewise received prize money amounting to $3.09.

R. J. Tschampers of the Texas Limited team of St. Louis, with a handicap of only 54 pins, piled up a grand total score of 1,849 to take second in the all-event competition. Second prize in this division of the tournament was $5.15. L. Forcade of the St. Louis Blue Bonnet team made a grand total of 1,826 using a handicap of 135 and took third in that branch of competition. He received $3.09. W. Medlock, captain of the Kansas City Allied Railway League team, was winner of fourth place in the all event contest with a total of