

Maintenance of Refrigerator Cars

(Continued from Page 11.)
FORT SCOTT, KANSAS

200 coal cars, 100,000 capacity, series 73,000, 74,000, 76,000 and 77,000 being rebuilt; 85 coal cars 100,000 capacity being converted into flat cars.

SHERMAN, TEXAS

Giving general repairs to 200 SF stock cars, series 46,200 to 47,199.

Giving general repairs to all equipment built and rebuilt in the last three years, at all shops. Expect to get out at least 8,000 cars in the year of 1925.

At the West Coach Shops, Springfield, Mo., in addition to regular line of work, they are building three new baggage cars.

Steel underframing six express-refrigerator cars;

Steel underframing two SF cafe cars;

Equipping 38 cars with electric lights in place of gas;

Equipping 30 cars with Vapor Steam heat in place of Baker Heaters;

Rebuilding five baggage cars, equipping with steel underframes, electric lights and steam heat;

Rebuilding 5 combination mail and baggage cars—equipping with electric lights and steam heat;

Rebuilding two combination mail and baggage cars for branch line service, equipping with electric lights and steam heat.

We are building at the American Car & Foundry Company's Shops at St. Charles, Mo., ten new all-steel baggage cars:

- 70' long
- 9' 10" wide
- 6 wheel trucks
- Clasp brakes
- Electric lights
- Steam heat
- Turtle back roofs.

Operating Income of Class One Railroads Increased \$14,454,-800 in January

Expenses on Operation Dropped More Than Million Over First Month in 1924

Gross operating revenue of Class One railroads, having a total mileage of 237,128 miles, amounted to \$484,773,600 in January, 1925, according to reports for the month compiled by the bureau of railway economics from returns filed by the carriers with the Interstate Commerce Commission. This was an increase of \$15,787,400 or 3.4 per cent over the same month last year.

Operating expenses totaled \$383,734,800, a reduction of \$1,357,200, or four-tenths of one per cent under those for January, 1924, while the net operating income was \$65,842,000 compared with \$51,387,200 in January last year—making an increase of \$14,454,-800.

DID YOU EVER STOP TO THINK?

By E. R. WAITE, Secretary, Shawnee (Okla.) Board of Commerce

THAT the ST. LOUIS and SAN FRANCISCO is a great Railroad? It is famous the world over.

BECAUSE the FRISCO stands with its eyes to the sun, seeing the great future ahead of the country it serves.

BECAUSE where business goes, a better country grows. On account of the progressiveness of the officers and employes of the FRISCO, people are seeking new locations along its lines every day.

BECAUSE there is a great diversification of manufactured and agricultural products along its lines. They are shipped to all parts of the world.

BECAUSE it has the reputation of being a good Railroad, and lives up to that reputation.

BECAUSE its officers and employes have a forward vision. They have such a booster spirit that no one can escape its influence.

The officers and employes of the FRISCO are men of broad vision, initiative and energy, who are filled with a determination to give even greater service than they now give.

Frisco Pioneers

(Continued from Page 9.)

unsafe manner, or any unsafe conditions, they reported to the master mechanic or the superintendent on that division, in order that we might have the trouble corrected. We all know that it is the little things that cause accidents, and since we have put this plan in effect, there has been something over 300 reports filed and something like 200 of the conditions that have been reported, corrected. We, of course, will never know just how many accidents we have avoided by the reporting of these 300 unsafe conditions. We do know, however, that so far as our employes are concerned, we have had something over 50 less injuries during the months of January and February, as compared with the same period for 1924, and I am thoroughly convinced that as soon as we get all of our plans perfected and every employe understands what we are trying to do, we will reduce our injuries to employes at least 60 per cent for the coming year."

The Safety Department has received great numbers of letters from school superintendents, thanking the Frisco for sending Morrill and Harrison to their schools, and requesting that they return for another talk on safety measures.

Comparative figures for 1923 and 1924 show the progress made during the latter year in accident reduction.

Ten Safety Commandments

1. All railroad crossings are dangerous.
2. Don't stand too close to the track.
3. Always look in both directions before crossing tracks.
4. After train passes don't be in a hurry, there might be another one from the other way.
5. Never walk along railroad right-of-way.
6. Don't hop moving trains. Thousands of children are injured each year by this practice.
7. Play your games somewhere else than near a railroad track.
8. Moving trains are dangerous things. Wait until they make a complete stop before getting on or off.
9. Talk safety to your fellows. If you save one life, you have done invaluable good.
10. Always think of the engineer. He is thinking of you.

In 1924, 23 autoists were killed and 359 injured by grade crossing accidents on the Frisco Lines, while in 1923, 32 autoists were killed. Six more were injured, however, in 1924. But nine lives were saved in 1924 over 1923 among motorists only.

The table shows in total of employes, passengers, autoists, licensees and trespassers, a decrease of 58 killed and 1,122 injured in 1924 over 1923.

And that splendid record, Mr. Hudgens believes, is largely responsible to the intensive safety work being conducted on the Frisco.

Mr. Hudgens issues through this number of the Frisco Employes' Magazine, an urgent request.

"I want to stress this request," he states, "that any of the magazine readers who know of any defect existing on the Frisco, which might in any way contribute to injury, report such condition to this office, in order that it may be corrected."

Engineer Walter Smith's Record

On February 7th, Engineer Walter Smith, of Birmingham, Ala., was called at Amory, Miss., to go out on Extra 38 south with a through train of merchandise to Birmingham, Ala. This train only made two stops for water—at Crews and Cordova tanks. Train had 1,400 tons out of Amory to Birmingham and the run was made in 7 hours, 15 minutes.

This fine run was made, only through the co-operation of every man who had anything to do with it, and was one of the best runs made on water by engine 38.

A
MAGAZINE WITHIN
A
MAGAZINE

The Frisco Mechanic

Published in the
interest of the F. A.
of M. C. & C. D.
Employees

VOLUME I

MAY, 1925

No. 8

The FRISCO MECHANIC

Published and Edited as a Department
of the

Frisco Employees' Magazine

WM. L. HUGGINS, Jr. Editor
MARTHA C. MOORE Assistant Editor

Associate Editors

WM. UNDERWOOD Chairman
HOWARD PICKENS Secretary

The Editor will be glad to receive
interesting contributions at all times.

VETERAN GONE

Ezekiel White, Former Station Agent, Dies

Beaumont Junction, Kansas, Employee
Served the Frisco 36 Years

Death has again entered the ranks of our pensioned employes and taken as its grim toll, Ezekiel White, age 72, former pensioned agent.

Mr. White was born in Marshfield, Ind., April 11th, 1853, and first entered the service of the Frisco in 1888, as agent at Beaumont Junction, Kans. It was while working at this point that Mr. White received injuries which left him crippled for life, but not so badly maimed that he was incapacitated for work.

Stationed as crossing watchman in Springfield, Mo., at the Boulevard crossing, he served for many years until he was transferred to the Broad Street crossing.

Remaining there until 1911 he was again transferred to Wishart, Mo., where he became station agent. This position he filled until March 24, 1914, when he was retired on pension.

June, 1920, proved to be a sad month for Mr. White, as he lost his faithful companion, Sarah M. White, to whom he had been married 44 years. From this time on, Mr. White's health began to fail, and in September of 1924, he became seriously ill, suffering from hardening of the arteries and high blood pressure.

It was necessary to remove him to the Frisco Hospital in St. Louis, and on January 24, 1925, he passed away.

A man of generous impulses and unimpeachable character, he leaves a host of friends who remember this kindly old man, who served the Frisco for thirty-six years, faithfully and well.

He is survived by five children, three sons and two daughters.

Section Men Perform Important Work For Those Who Travel Rails

Average Traveller Disregards Guardians of Track and Roadbed Who Labor Toward Safety and Comfort

The observation car is always crowded with folks who want to get a wider view of the country through which they are passing, and more than once a comment is made on the roadbed as it disappears into two thin lines of steel for mile after mile. But the average traveler, who gives a wave of the hand or a nod to the section men who step out of the way while the train passes by, does not realize just what relation these section men have to the fine roadbed over which he is passing.

The section man's work is largely confined to the track and roadbed, therefore it necessarily follows that his work is extremely important and at the same time he probably receives less pay than any other class of labor

to proper gauge; it must be properly lined; it must be properly surfaced, as well as properly tied, that is, the proper number of good ties be maintained at all times under each rail on the main line and each rail on the passing or other auxiliary track. The switches must be kept in good condition; the switch lights properly cleaned, and kept lighted at all times and burning so that they will give a clear view to the engineer.

Care of Lights Is Important

But more in detail as to his duties: the care of the switch and signal lamps is one of his most important. This means cleaning and lighting them. It means there must be no light failures and these lights, which the section men take care of are in-



Superintendent E. L. Magers of Eastern Division, section foreman and gang, at Brookline, Mo. Reading from left to right: E. L. Magers, superintendent; Claude Tuter; Earl House, foreman; Robert Staggs; Hubert Forster, and Doc Sumner.

employed on a railroad. If there is any imperfection in the track, that is, to any great degree, (and by track this also includes the switches, etc.), it is bound to be felt in the train operation and may be extremely hazardous.

This hazard the section man attempts to avoid under the supervision of his foreman. In order to make this track safe, certain standards must be followed and certain work performed. The track must be kept

stalled on switches, block signals, interlocker signals, railroad crossing signals, etc. They mean a very great thing that there is either danger or deal to the engineer, indicating to safety ahead and generally speaking, of course, red means danger and green means safety. These lights are the sign language for the engineer and more perfect than speech.

Another duty of the section men is applying ties. The section foreman and all concerned have instructions

and know that there must not be a broken tie in the track anywhere. The section men are the ones who get the instructions last and who literally comply with these instructions.

They are also required to load and apply ballast. This may refer to rock, gravel, chatts, or cinder ballast, all of which are used on the Frisco and the application means as a general rule, retamping every tie where the ballast is applied, so that each individual tie will have a firm foundation and there will be no material letting down, or giving way, under the pressure of heavy engines and loads.

Quite important to the even riding of the cars, engines and trains, is a straight and level track. This requires lining and surfacing to do away with any rough spots, and prevent damage or derailment.

Proper drainage is said to be the life of track, therefore a great amount of time is spent by section men cleaning ditches along the side of the track, so the rain will flow away from the track and the roadbed, thus doing away with any possibility of soft spots, which if allowed to exist, will cause serious trouble and possible accidents.

Called Out in Emergency

In times of extreme heavy rainfall, cloudbursts, or storms bordering on cloudbursts, the section man is called upon to get out and patrol the track, to make sure that it is entirely safe for the operation of trains and if he finds it is not, he sees that proper flag protection is maintained in order to keep the trains from running into trouble, reporting the conditions just as soon as he can to the dispatcher.

Switches must be inspected every day. They require close attention. The points must always fit closely, all bolts must be tight and so applied that the nut will be uppermost, thus being visible and free to inspection. In addition to the nut being tight, a cotter key is inserted which prevents any possibility of the nut working off and the bolt being dislodged from its proper location.

There are, of course, a great many other duties which are required of these men, such as: grassing track, mowing and burning right of way, dressing ballast, cleaning station grounds and yard, laying rail, applying tie plates, tightening bolts, repairing right of way fence, repairing or putting in cattle guards, looking after public and private crossings, gauging track, coaling engines, cleaning snow and ice from switches and frogs or station platforms.

All of these duties are performed under the supervision of the section foreman.

As the track requires constant inspection, these men are required to live very near to their work, as they do not know at what hour of the night or day they may be called upon to perform any one of the above duties.

The accompanying picture, which was taken at Brookline, Mo., on the

Eastern Division, shows in the rear a section tool house, superintendent of the Eastern Division, E. L. Magers, section foreman and his section men on their section car ready to go to some point on their section.

The railroad could be likened to a huge wheel, with hundreds of spokes, each important to the rotation of the wheel, but one of the strongest and one of the most necessary spokes is the section men, who brave ice and snow, rain and wind, patrolling the track, mile after mile in dreary solitude, perhaps far into the night, to see that the track is safe for the burden of life which must pass over it.

Forty Year Badge to Engineers Morrill and Hufschmidt

B. F. Cooper, General Chairman of
B. of L. E., Presided Over
St. Louis Meeting

You have no doubt thought it a comparatively easy matter for a man to secure a position as fireman, after he had gone through the necessary work.

But have you ever given a thought to the time it takes for him to become an engineer?

Here are some statistics: Out of every 100 men who apply for a position as a fireman, 15 per cent fail to pass the physical examination. These same men can go into any army or navy enlistment office and pass a perfect physical examination, but their failure to pass the examination standards set by the railroad, is because they are so very rigid.

If they happen to pass, out of every 100 firemen, only 17 of them ever get to be engineers, and out of these 17, only 6 finally reach the position of passenger engineer.

These statistics were given by B. F. Cooper, general chairman of the Brotherhood of Locomotive Engineers, when the engineers met on the night of March 11th to present the Forty Year Honorary Badge to Brothers J. W. Morrill and Charles Hufschmidt.

It was a meeting of old friends, and comrades and many a story was recalled when the two honored members were "firing" long before they reached the coveted position of engineer. The presentation of the badges was made by Carl Rudolph, an organizer for the Brotherhood of Locomotive Engineers, and in his presentation, he brought out the four standards set by the Brotherhood: Sobriety, Truth, Justice and Morality.

Mr. Morrill, who is better known to the Frisco folk as "Uncle Billy," and Mr. Hufschmidt were deeply touched and their short speeches of respect showed deep emotion.

H. W. Hudgens, of the Claim Department, represented the officials and expressed the respect and high regard the Frisco officials hold for these veterans.

E. T. White, local chairman of the Brotherhood, presented each of the

honored guests with a beautiful gold watch charm from the firemen. On one side was the monogram of the Brotherhood, and on the other the emblem of the Masonic Order.

The Ladies Auxiliary was represented by Mrs. Ella D. Turner, who extended the congratulations of that organization.

During the evening, Mr. Cooper called on the following for short talks: D. W. Gramling, chairman of the Missouri State Legislative Board; General Chairman of the Missouri Pacific System A. W. Machin, and General Chairman of the St. Louis Terminal Railway R. H. Wadlow.

John Weckerly of Division 428, who resides at Newburg, Mo., was introduced by the chairman as "The Daddy of Them All". Mr. Weckerly is the oldest of the veteran engineers on the Frisco Lines. Many of the present day veterans have fired for him.

Martha C. Moore, associate editor of the Frisco Employes' Magazine entertained the veterans with a musical monologue and a humorous selection entitled "The Railroad Crossing", which added to the merriment of the evening.

The musical part of the program was given by the following: Miss Davis, daughter of Engineer Harry Davis of the Chaffee District, a piano solo; Little Miss Hedges, six year old daughter of W. K. Hedges entertained with a number; Miss Donahue, daughter of W. J. Donahue, delivered an appropriate selection; Morrill Crowe, son of Thomas Crowe and P. Clancy sang selections which were enthusiastically received.

A buffet luncheon was served at the close of the meeting, and introductions were not necessary, as everybody was acquainted, and a half hour of good fellowship followed before the guests departed.

HUGO, OKLAHOMA

W. F. MOORE, Reporter

The first social meeting of the Hugo Chapter of Federated Shop and Car Employes was held Monday, March 2, 1925, in assembly room of passenger depot.

The first meeting was held mainly as a "get-together," "get-acquainted" meeting. Between 75 and 100 people were present and of the total number of employes that could come without laying off, only three families were not represented.

Due to the large crowd and small room afforded, no planned program was followed.

Speeches of the foremen and visiting members from Paris, Texas, and readings from the ladies constituted the program for the evening.

Music and cards were enjoyed by a number, and at the close of the meeting, refreshments were served.

The next social is to be held the first Monday of the month and is to be a real entertainment. Elaborate preparations are being made so that the crowd can be kept moving and fun abound in great quantities.

The Question Box

Conducted by A. H. OELKERS

The following questions and answers were submitted to the Question Box by J. A. Pullar, apprentice instructor. These were taken from Apprentice Lessons. Send all your questions to Mr. Oelkers, in care of the Magazine, and he will give you an answer:

Question: What is the object of locomotive boiler inspection?

Answer: It is to determine as to whether the boiler is in good condition for service, and the amount of steam pressure to which it can be safely subjected.

Question: How is the inspection made?

Answer: By making a careful examination of all parts of the boiler.

Question: What are the parts of the boiler that should be examined in detail?

Answer: The shell or barrel, the sheets of the firebox, the stay bolts, the braces and the tubes.

Question: How is the barrel to be examined?

Answer: For a complete examination of the shell of the boiler it is necessary that the tubes should be removed and the jacket and lagging removed from the outside. When this has been done, the metal of the shell should be carefully examined in every part for defects due to corrosion and leaks. The interior is to be examined by entering through the top of the dome, which is large enough to admit the body of a man.

Question: What are the usual forms of corrosion to be found in the shell of the boiler?

Answer: They are pitting and grooving.

Question: What is the appearance of pitting?

Answer: It appears as its name indicates in the form of pits in the surface of the metal. These pits may vary in size, from the size of the head of a small pin to large patches cut into the surface and presenting the appearance of a skin that has been pitted with smallpox. Usually, however, there is an area of smooth metal between the pits.

Question: What is the appearance of grooving and where does it occur?

Answer: Grooving, as its name also indicates, is the formation of a groove in the body of the metal, and it usually occurs close to a lap or seam in the shell.

Question: What is most important in firing an oil-burning locomotive?

Answer: Keeping the fire regulated to suit the draft of the engine. The amount of air drawn into the firebox is dependent on the amount of steam being used because the exhaust steam in passing through the stack sucks the air into the firebox. The fireman must at all times observe the working of the engine and feed the quantity of fuel oil to suit the draft created by the exhaust steam.

Question: What is meant by the flash point of oil?

Answer: It is a term used to indicate the physical property of any oil that will burn and has reference to the ease with which it may be ignited. When an oil is heated so that it gives off vapor the flash point is designated as the temperature at which it evaporates fast enough so that a flame brought to the surface of the oil will ignite the vapors with a flash and then go out again. When the temperature is brought high enough so that the vapor comes off fast enough to sustain the flames, the "fire point" is reached.

TRIBUTE TO ENGINEERS

Recognition is coming to the valient members of the engineering profession, as indicated by this splendid article from the Scientific American. It is justly so. Wherever the vanguard of civilization leads, wherever dangerous days and lonesome nights abound, wherever work of a constructive nature calls, though it be nerve-racking and soul-straining—there the world will find the engineer. We produce this article with pleasure:

From the Scientific American

If we were asked to name the body of men to whom more than any other civilization owes its marvelous facilities, we would name the engineers. Furthermore, if we were asked to pick from among the leading professions that one whose prominent names pass most readily, even though most unjustly, into partial or absolute oblivion, we would have to name again the profession of engineer.

During the prosecution of any great and difficult engineering construction, both the work and its author supply good copy for daily papers. But once the great work is completed in service, the politician and the banker begin to play the star parts in connection with the enterprise, and the man of genius, who had the imagination, skill, perseverance and the executive ability to put the work through, slips quietly into the background.

Fortunately, there are exceptions; though they are painfully few. To look at a locomotive is to remember Stevenson, and the river steamboat brings Fulton to mind. Charles Parsons, Bell, and Marconi, without any direct effort on their part, have stamped their names forever on the steam turbine, the telephone and wireless transmission. But for the few that, by the accident of things have been thus fortunate there are hundreds, nay thousands, of engineers both civil and mechanical, who as contributors to the upbuilding of our modern civilization are forgotten; whose names are not now and probably never will be associated in the public mind with their public works.

Parsons Built Gotham Subways

William Barclay Parsons designed and built the first New York subways. To judge from daily talk, a stranger might well believe that a certain John Hylan did it.

Our commerce thunders on steel rails across the wide span of the Mississippi, or moves safely by ship out through the bars and sandbanks at the mouth of that river; but who among us today

ever think of the credit due to that great engineer Eads, who, by his system of jetties opened up to commerce the entrances to the Mississippi and to an untold number of harbors and rivers throughout the world.

Give Them Credit

Ask yourselves, good friends, when you have solved your nightly crossword puzzle, who it was that built the first transcontinental railway or the great 125-mile aqueduct from the Catskill Mountains to New York City, or the vast irrigation dams of the West; or name the men who were responsible for the marvelous water turbines, generators, and vast tunnels and shafts which have made the power of Niagara available for industrial service. If you fail to answer these questions, perhaps you can call to mind the names of the men to whom we owe the present huge steel industry, upon which more than upon anything else the industrial development of the world depends. Who was it that rendered steel so cheap that it became available for almost any constructive work of architecture or engineering? Do you realize that the world has been very ungenerous to its engineers in the matter of memorials? We have shafts, effigies and "forget-me-nots" to kings, popes, bishops, soldiers, politicians and what-nots without end; but how many great memorials can you find to the engineers who, more than all of these, have made this boasted civilization of ours what it is?

"Hoots From Springfield's Night Owls"

South Roundhouse, Springfield, Mo.,
Night Force
EMERY HAGUEWOOD, Reporter

Claude White, S. M. W., has been absent several nights on account of the death of his mother. Your reporter, having recently experienced that same loss, offers you his sympathy, as does the entire night force.

We were very agreeably entertained several nights ago by the presence and talk of our genial general chairman, Wm. Underwood, and as a result, "Every employe is a member", of the Frisco Association of Metal Crafts and Car Department Employes.

Tommy Elkins informs us a fine big boy took up his abode at his home several days ago. Hope to have the little shiek's picture for the Baby Page soon.

Say, if the rest of you fellows hear someone go whizzing by, but can't see them, we'll just tip you off as to who it is. It's the boilermaker and his helper going from one hot one to another.

Otis Cook is our new electrician, taking the place of Charles Fletcher, transferred to Wichita, Kans.

The whole force is interested in the bill now in the State Legislature to legalize racing in Missouri. The chief cause of this interest is the proposed race between Evan Carr (flue borer) and a terrapin. The race will start in the roundhouse at the east end and extend to the south end where the contestants will do a square right-about and return over the same course to the starting point. The reason for doubling back is that neither one can claim a handicap by being on the outside track all the way.

Shop Methods of Counterbalancing Driving Wheels

Some few months ago, instructions were issued to those concerned, regarding the rules for counterbalancing of driving wheels.

This technical data, besides proving itself valuable, is unusually interesting to the shopmen, and in answer to numerous requests, and through the kindness of R. F. Peters, mechanical engineer, these complete instructions are given below:

1. Proportion of weights to be balanced.

All of the revolving weights and two-thirds of the reciprocating parts should be balanced.

2. Revolving parts—weights:

Weights of one-half of each side rod bearing on crank pin for each driver; for main crank pin add the back half of main rod.

Each wheel should be accurately balanced for all its revolving weights. See Figs. 4 and 5 for method of weighing rods.

3. Reciprocating parts—Weights:

Piston with rings, piston rod, keys, crosshead complete, crosshead pin, and the front end of the main rod with brasses. See Fig. 5 for method of weighing main rods.

Take two-thirds of the weight of reciprocating parts and distribute it equally among all wheels.

If the small diameter of the main wheel will not allow of sufficient counterbalance according to rule, then increase the balance in each of the other wheels to compensate, but in no instance must this excess be greater than 50 pounds per wheel.

4. To find the amount of lead required:

Place axle with its journal on the straight edges as shown on drawing, see Figs. 1 and 2, and level the straight edges by means of the adjusting screws. Turn the wheels until the center of one crank pin is above and exactly in a vertical line drawn through the center of the axle.

Hang the yoke on the opposite (horizontal) pin, see Fig. 3, then add weights until the sum of the weight of the yoke and added weights just balance the wheel, then deduct this weight (weight of yoke and test weights) from the combined weight of revolving and reciprocating weight on the crank pin and the remainder will give you the amount of lead to put in the counterbalance pockets.

5. Shop method of counterbalancing driving wheels:

Place the axle with its journals on straight edges as shown in Fig. 1, and level the straight edges by means of the adjusting screws.

Follow the method of leveling shown in Fig. 2, to get accurately the center of crank pin on horizontal center line through axle.

Hang the yoke on pin as shown in Fig. 3, then add weights until the sum of the weight of the yoke and weights

Complete Diagram Instructions

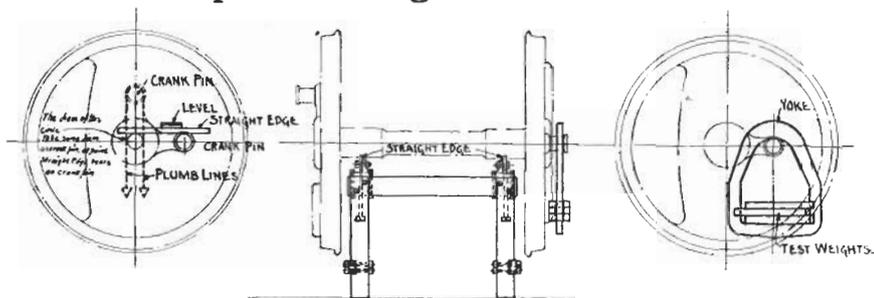


Fig 2

Fig 1

Fig 3

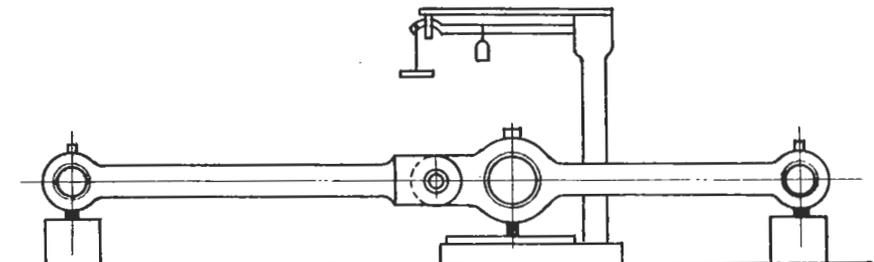


FIG. 4.

Side Rod Complete with Brasses.

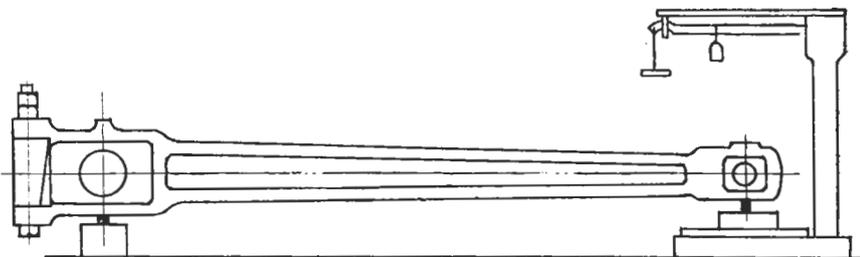


FIG. 5.

Main Rod Complete with Brasses.

equals the exact sum of weights of all detached revolving parts on this wheel, plus the proportion of the reciprocating parts as determined in paragraph No. 3. Increase or decrease the counterbalance opposite the crank pin until it exactly balances the weights hung on pin.

Example: Take engine 745:

	Pounds
One piston	310
One piston rod	195
One crosshead, alligator type, complete	570
One crosshead pin	36
One front end of main rod and brasses	298

Total weight of reciprocating parts1,409

Take two-thirds weight of reciprocating parts which is $1,409 \div 2/3 = 939$, and divide it equally among all drivers. $939 \div 3$ drivers = 313 lb for each driver.

For method of getting weights of side and main rods on crank pin, see Figures 4 and 5.

	Back	Main	Front
Reciprocating wts. to be balanced.....	313	313	313
Back end of main rod		413	
Front end side rod...			184
Center of side rod...		387	
Back end of side rod...170			
Wt. to be counterbalanced	483	1,113	497
Weight obtained	417	1,133	447
Over balanced.....		20	
Under balanced	46		50

Weather Wise

Widow Waffles: "Yes, three times I've dreamed you and me was going 'and in 'and down the church path. I wonder wot it do mean?"

Widower William (a laggard in love): "A-ah now—I shouldn't wonder if it don't mean we be goin' to 'ave a drop o' rain."