

# Drafting Room Practice in the Signal Department

## Outlining the Signal Drafting Methods Adopted by the Illinois Central

A L B E R T G . M O O R E

Probably in no line of engineering work are there more urgent requirements for an efficient drafting force than in the signal department of a large railroad. To handle signal construction work properly, or to recall past or present signal conditions, at any location, requires signal plans and signal plans which are reliable. Too often the plan leaves one in doubt as to the actual conditions on the ground. This efficiency, which is required by a well organized signal de-

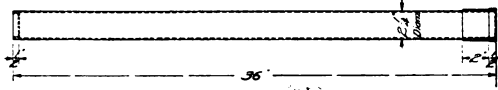


Fig. 1.

partment, can be brought about only by definite drawing room practice.

The need of uniformity in the sizes of signal department drawings is very great. They should, when folded, be of standard size. This is realized most by signal companies and state railroad commissions. The plans received by these two bodies vary from a size smaller than a letterhead to that of a daily newspaper. The Railway Signal Association is

tions to draftsmen, entitled "Drafting Room Practice." This book consists of about seventy pages and contains positive instructions to the draftsmen. Additions and changes are made in it from time to time and draftsmen are expected to conform to them as closely as possible. This book illustrates the style of lettering for all drawings, the method of dimensioning, the character of titles, the size of plans, etc. It sets forth the different styles of locking used, the standard symbols to be shown on plans, etc. By a careful study of this book, a new man can readily produce plans, which will be in accordance with the regular work of the drafting room.

The second essential in drafting practice is the size of the plans. The size to which all plans will fold is 8 in. x 13½ in. This is about the same as the size of the New York Central Lines' plans. All plans have a margin of 1 in. which is used for binding. (More on the size will be mentioned further on in this article.)

The method of filing tracings, plans and records is always an interesting study and calls for careful thought. The tracings pertaining to interlocking are largest in size, and in a majority of cases are too large to be filed flat. Therefore, in filing these tracings, tubes are used which are 2 in.

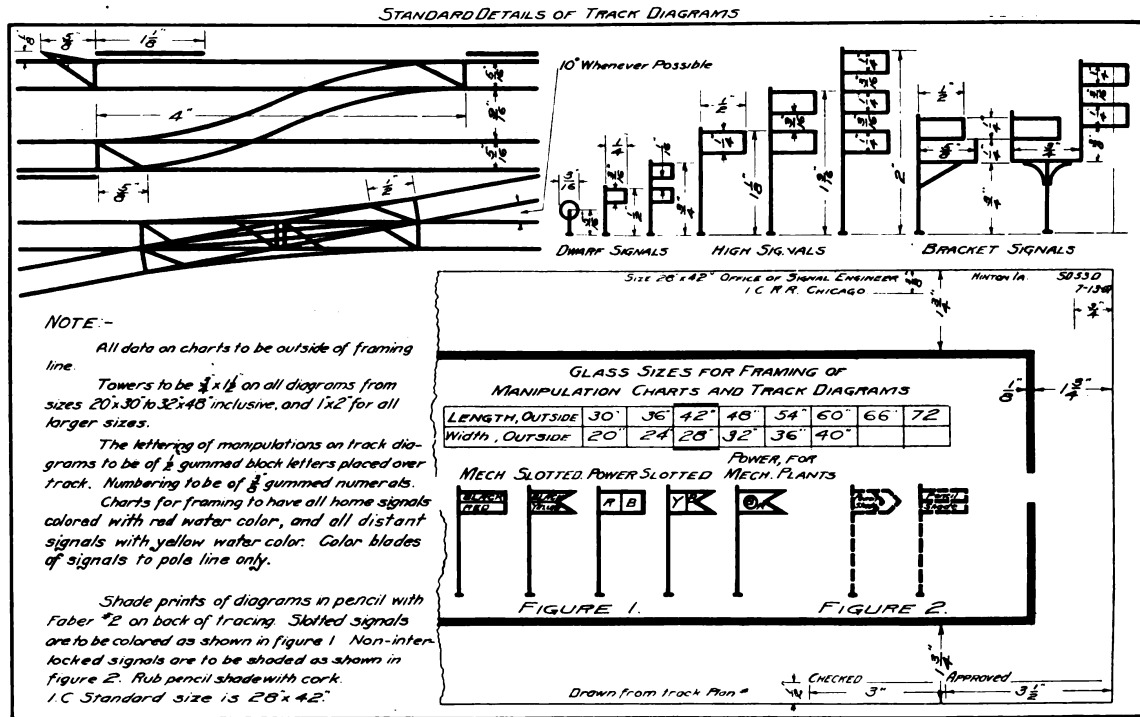


Fig. 2.

gradually bringing about standardization of all features in signaling, and it is to be hoped that the standardizing of signal plans will shortly come about.

It is the desire of the writer to present to those interested, the drafting system, as practiced by the signal drafting department of the Illinois Central Railroad. The most valuable asset of the drawing room is a book of instruc-

in diameter by 37 ins. long. I am embodying with this paper an illustration (Fig. 1) which will indicate the construction and general outline of these tubes. Particular attention is called to the ends of the tubes. In general, tubes are of lighter construction than ours, and the ends are knocked off and the tracing ends exposed.

All file cases are built on the unit or flexible plan, so that

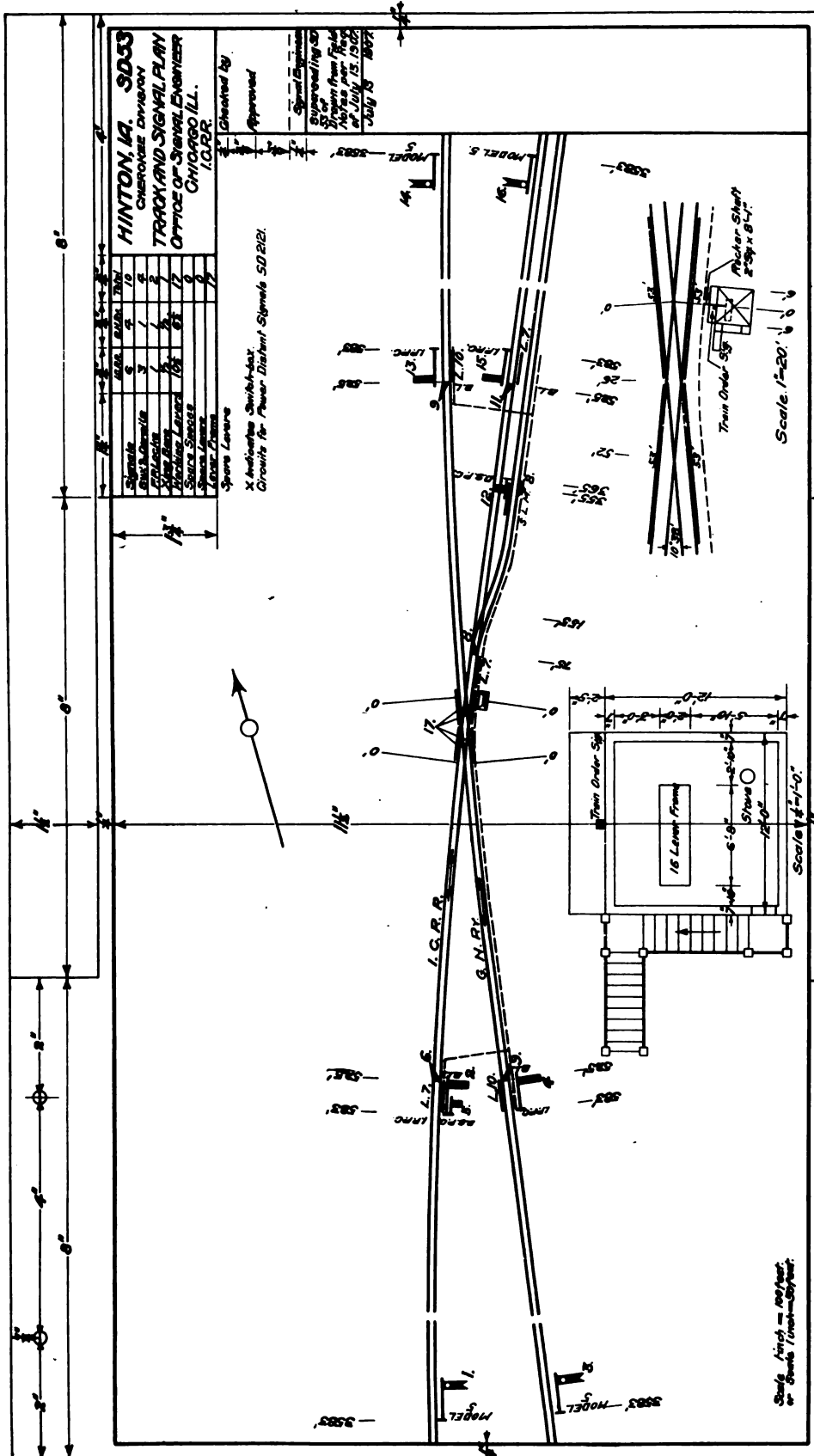


Fig. 3.

a relocation of the office or re-arrangement of furniture necessitates very little delay in work and no inconvenience.

The filing cabinet for the accommodation of tubes is built along the same plan as the above, being provided with small doors to keep out the dust.

Block signal and special wiring plans are drawn 8 in. wide and are kept in numbered partitions in shallow drawers, which permit of each tracing, which is 1 in. in diameter when rolled up for filing, to occupy a separate compartment; each separate compartment being numbered consecutively in a series of tracings which go to make up a long block signal plan. Experience has shown this to be a more satisfactory practice than the filing of narrow plans, which are comparatively long, in tubes. Signal department standards are 8 in. x 13 1/2 in., and the miscellaneous letterhead size plans are filed in the ordinary vertical files.

Another important part of a drafting room system is the numbering method used. In the

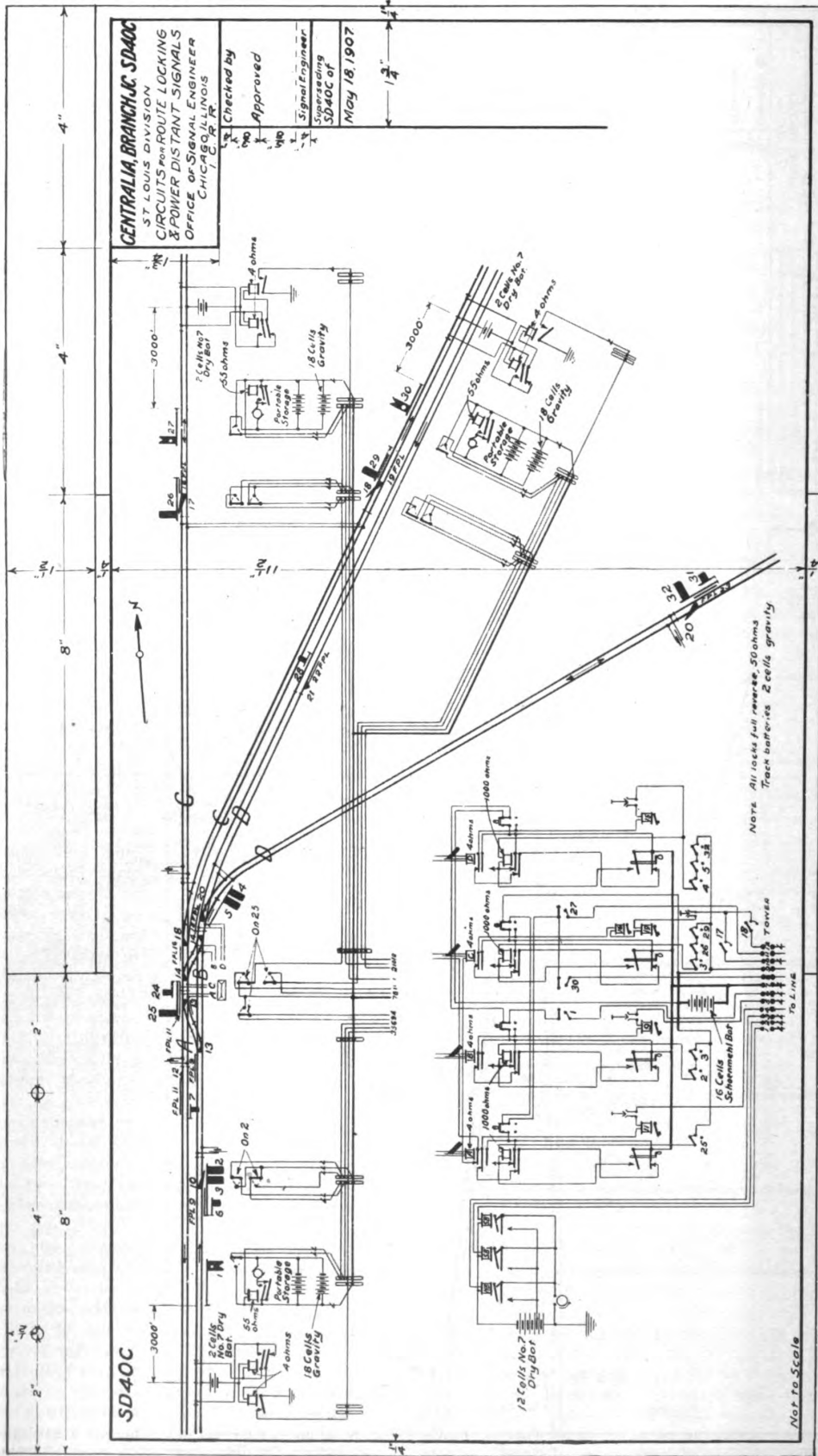


FIG. 4.

writer's study of the requirements, it has been impressed on him that the more simple the numbering scheme, the more efficient the system. Our numbering system is apportioned as follows:

Nos. 1 to 1,000 are assigned to interlocking plants (actual, not proposed).

Nos. 1,001 to 2,000 are assigned to block signal, crossing bell (etc.) plans.

Nos. 2,001 to are assigned to signal department standards. Each number in the interlocking series indicates the plant which is represented by the track and signal plan. All supplemental interlocking plans contain this number with a letter suffix, as for example:

67, Hanson City track and signal plan.

67A, Hanson City locking sheet.

67B, Hanson City dog chart.

67C, Hanson City circuit plan.

67D, Hanson City diagram of signals.

67E, Hanson City leadout plan.

67F, Hanson City future signal plans, etc.

All employees connected with the drafting room will, by this practice, become accustomed to the number of the various interlocking plants and retain them in their minds and



also will derive the number of any tracing of the plant. As all tracings, record and reference prints are found under this specific number of the interlocking plant, there is seldom a delay for index reference. For instance, all records of Hanson City interlocking are filed under No. 67 and all reference prints, appertaining thereto, are filed in another part of the file in a folder numbered 67. The tracings are filed in a corresponding tube numbered 67. Records of plans are made in loose leaf books, filed in a small cabinet.

In the drawing books one sheet 5 in. x 8 in. is given to each drawing number. In the case of interlocking, all plans under the special number of the plant are entered on this sheet, the same being applicable to block signal numbers.

The requisition is then filed under the number of the interlocking or block signal plan; the date on the requisition corresponding to the date in the change column of the plan, this being in order that the relation between the two is established. By this method, it is possible to follow all changes made in the plan from the beginning, and to state why the several changes occurred.

In the development of interlocking plans, a survey is first made either of the existing plant or proposed plant; notes are taken in a field book and plus readings taken for the location of all switches, derails, beginnings and endings of bars, signals, frogs, insulated joints, tower buildings, stand pipes, curvature of tracks, crossing of pipe lines and trunk-

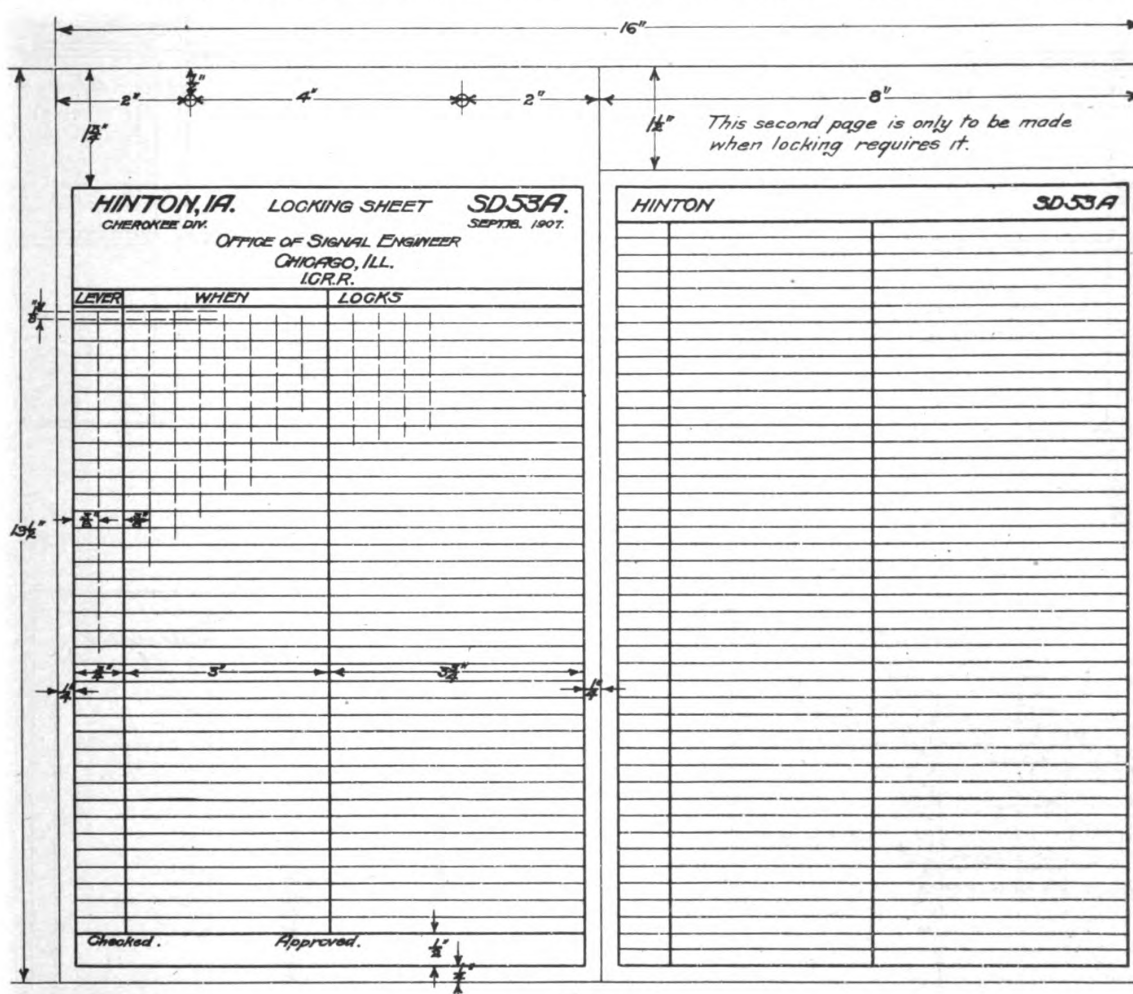


Fig. 5.

Considerable room for argument exists between the card index and the loose leaf index, each having several advantages.

It may be of interest to describe the method of recording changes in plans. A drafting requisition, the size of which is standard (8 in. x 13 1/2 in.) is issued for the change and states clearly what is desired. Such a requisition bears the signature of the originator and is approved by the signal engineer before any change is made. All notes, sketches, colored plans illustrating the change are attached. When the changes are complete, the draftsman goes to the reference file, destroys the reference prints affected, making note on the requisition to the effect that he has done so, entering the finishing date on the requisition. This requisition is then signed by the person who checks the plans, the signal engineer signing to the effect that the changes are satisfactory.

ing, telegraph poles where trunking runs are made, streets, etc. The angle of crossing, track centers, size of rail, run of pipe lines, location of bar, direction of derailment, etc., are all carefully noted.

It is customary to have all interested parties present and to have them state their wishes definitely as to the signaling and locations on their respective roads. This greatly reduces the changes in the plan and alterations in construction work.

Upon returning to the office, these notes are cut out of the field book and pasted in their relative positions on paper the size of the requisition, the plan being then drawn to a scale of 1 in. to 100 ft. All tracks are drawn to the correct alignment and readings only placed at the different locations, as shown in Fig. 8 (Hanson City SD 67). There is great convenience in not showing the dimensions from one function to

another and it greatly simplifies the plan as well as reduces the necessary drafting. This plan folds to the standard size of 8 in. x 13½ in., with a binding margin at the top. For the size and form of track plan see Fig. 3.

tween tracks. All figures are made by ¾ in. to ½ in. gummed characters. Fig. 1 illustrates the details of Standard Track Diagram. We use a black line print on a heavy cream colored paper, which is made by a direct process from

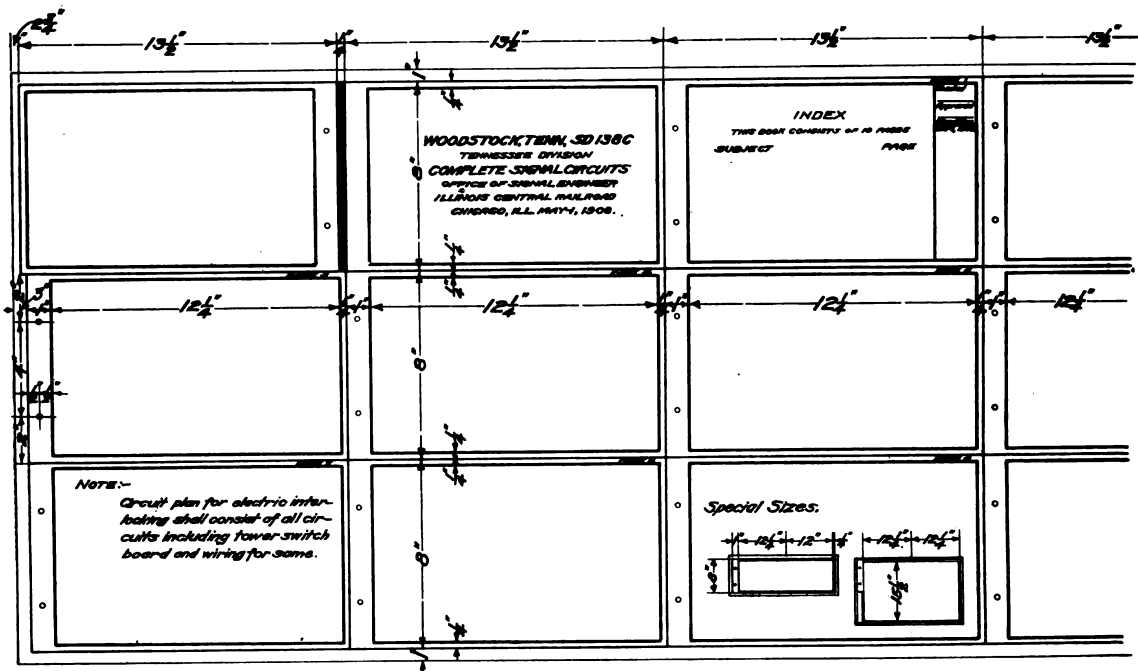
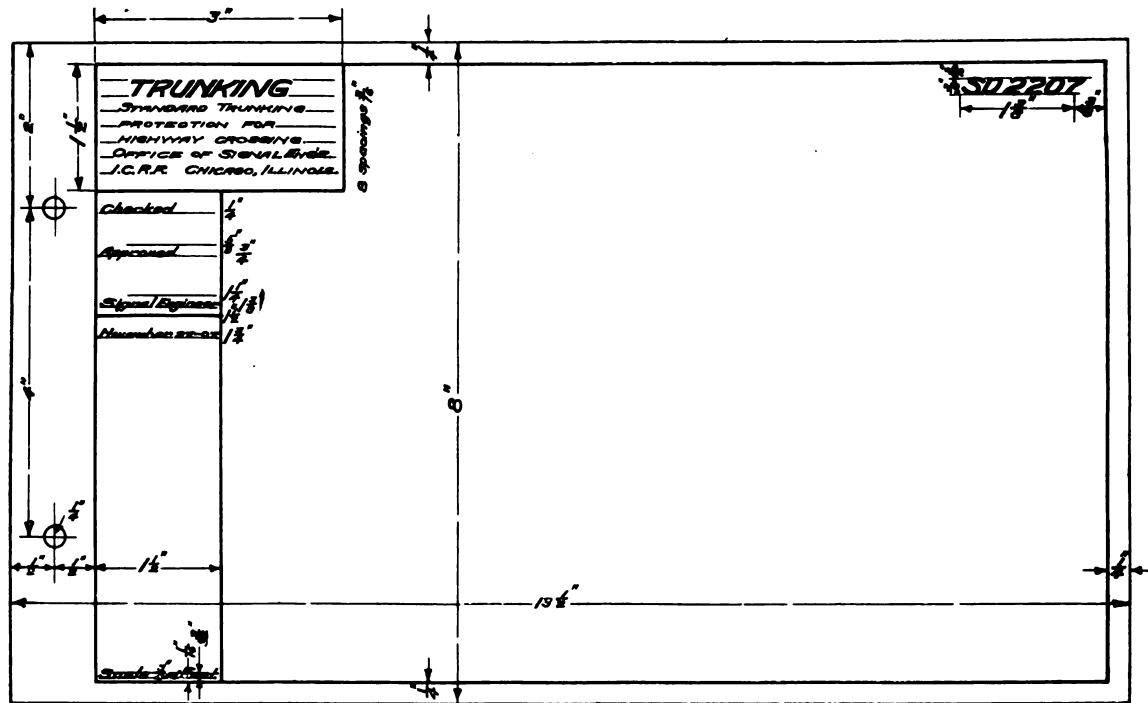


Fig. 6.

The standard forms of locking sheet and circuit plans are shown in Figs. 5 and 4. Diagrams of signals are not made of

the diagram of signals. These prints are framed for the towerman's use. The advantage of the direct process is in



Title and drawing number are 7/8" high, all other printing 3/8".

Fig. 7.

size to fold 8 in. x 13½ in., but the standard size for the glass. The charts are drawn approximately to a scale of 1 in. equalling 20 ft., with a spacing of 5/16 in. and 9/16 in. be-

not filling up the interlocking tube with clumsy negatives, which are only required once and in all probability will not be used again.

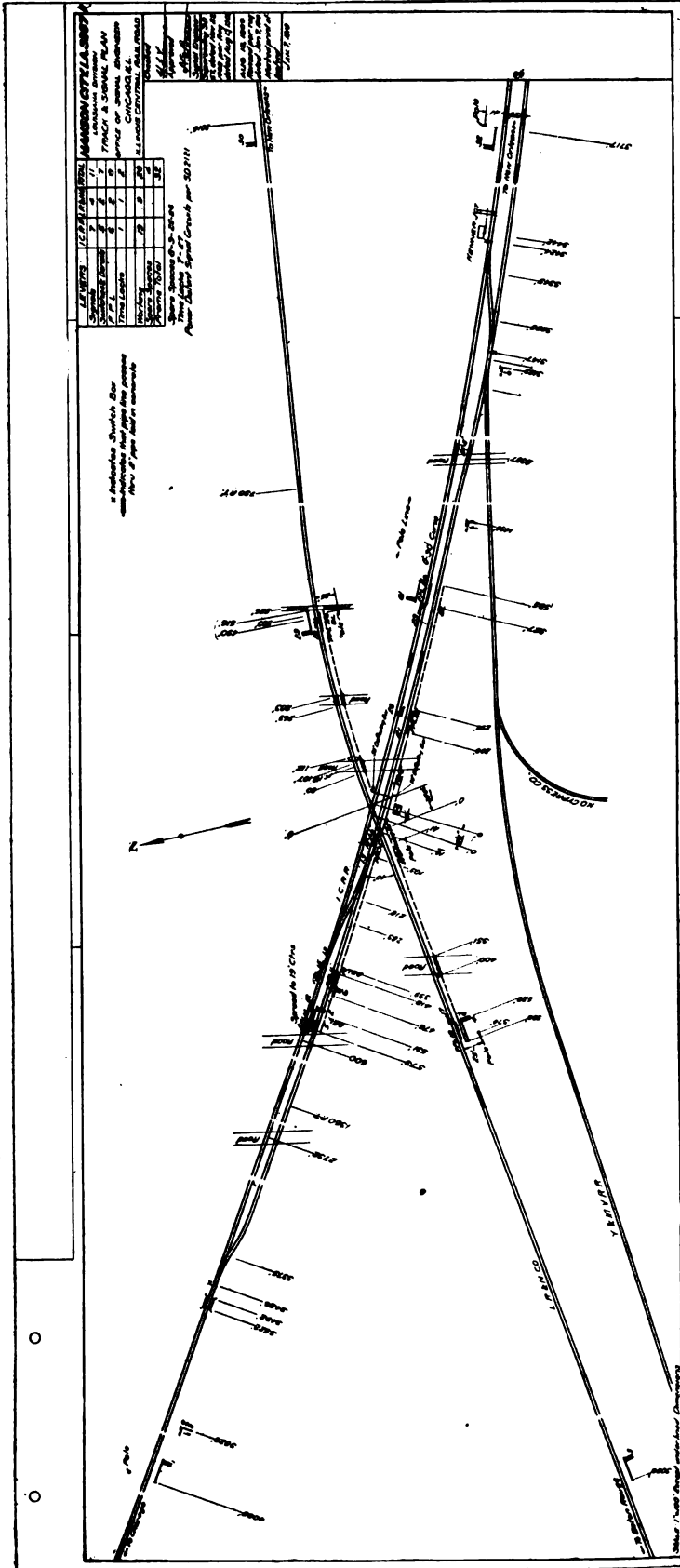


Fig. 8.

It is our practice to draw a leadout plan showing the pipe line run, the rocker shaft or crank arrangement, the drilling of leadout plates for rocker shafts, when required and the foundation of the tower, when required.

Block signal plans are developed the same as interlocking plans by a direct survey on the ground. The mile post is usually the zero for the measurements and plus readings are taken for signal locations, insulated joints, poles for line wire, cut sections, curvature, highway crossings, bridges, etc. A new zero is started at each mile post. The readings are shown only on the plan opposite the illustrated locations. The profile and curvature are also shown, the pole line being omitted.

The circuit plan shows all tracks and dimensions from one location to another. All circuits are shown except the local wirings which are referred to as a standard plan.

The signal department standards which illustrate the material furnished by the company's shops and also illustrate the standard method of installation as well as standard circuits, are too large in size, being 8 in. x 13 in., for the foreman to carry around with him conveniently; and it is our latest practice to photograph these on celluloid negatives, in a size suitable for a small looseleaf book. The foreman can therefore offer no excuse for not entering all prints in his book when they are received by him.

The last object of importance to be mentioned is the method of making estimates. The estimating sheets, or forms, are standard size, and are bound together with prints, colored or otherwise, together with all notes in an estimate cover. This cover is numbered and the location given and a general description of the estimate shown thereon. After being duly signed, the estimate is filed away in the usual manner. The principal thing is to make sure that the estimate will clearly give the information desired, regarding details and that the folder contains all necessary papers.

It is earnestly hoped that the above may be of interest to those in charge of drafting room work, and that there may be an exchange of ideas on signal drafting in these columns.