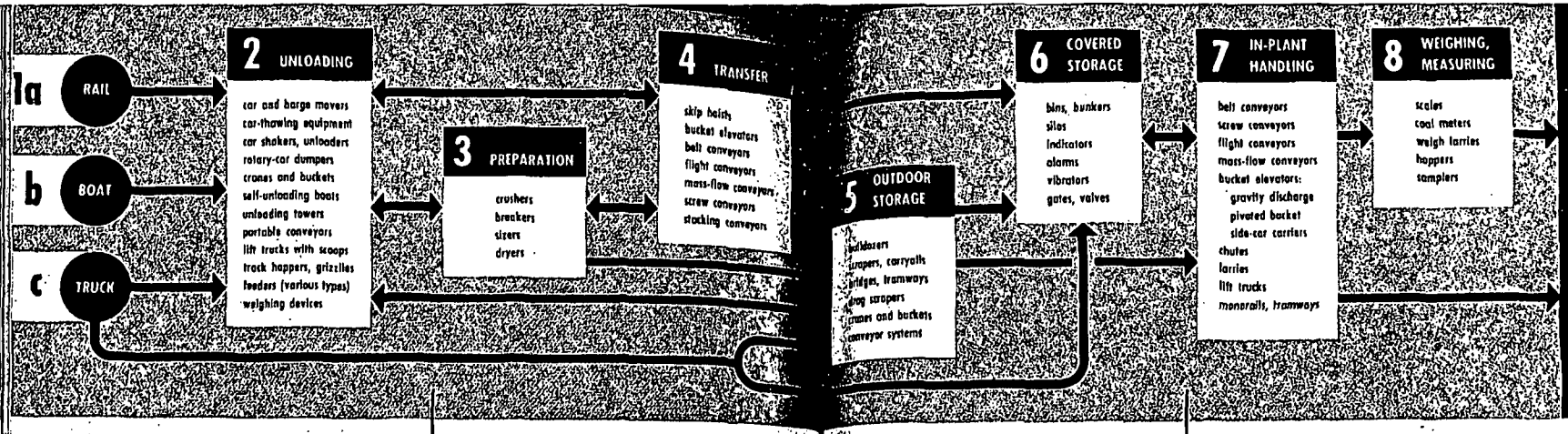

RECEIVING, UNLOADING

Unloading setup depends largely on the way coal arrives. Some forms of shipping — barges, for example — can't self-unload at all, so unloading equipment is an absolute necessity. Other types, like hopper cars, can self-unload, but we often install equipment to speed the job or make it easier under bad conditions (dumpers, thawers, shakers, etc). And frequently we add devices, such as feeders, to set up a controlled flow to the next step in the handling process.

PREPARATION, TRANSFER

If coal is bought unsized, and sizing is desirable for storage or firing, *preparation* may be done near the receiving point, as diagrammed, or in plant near point of use.

By *transfer*, we refer to handling between the unloading point and the final storage point from which coal normally discharges to the firing equipment. It may involve only one piece of equipment, or several, depending on local conditions and whether there is more than one storage.

STORAGE

Since it isn't practical to deliver coal at the rate it's burned, we use storage to permit less frequent shipments and to iron out variations in delivery. Storage may be outdoors or under cover — either in a silo or similar outside structure, or in bins or bunkers in the plant. It's now common practice to have a relatively small storage for normal needs and a larger one (often outdoors) for reserve, with means for transferring from dead to live storage.

IN-PLANT HANDLING

In plant here refers to handling between final storage and the firing equipment. Sometimes this would mean no more than chutes to direct flow to individual firing units and gates or valves to control flow. Or, we might have a conveying system to feed coal from any bunker section to any firing unit and to move coal from one bunker section to another. Weighing or measuring may be done near firing units, at the receiving point, or at both locations.

COAL HANDLING: For its few or many steps . . . a growing array of equipment combinations

In essence, the job of a handling system is to move coal from a receiving point to the firing equipment. Whether it's simple or complex depends on how we receive the coal, how the plant is situated, and what we expect from the system in capacity, flexibility, convenience, etc. To meet such a variety of conditions and requirements, we have an extensive array of mechanized handling devices, which may be combined in almost innumerable ways.

Basic Steps. It just isn't possible to set down what we might call a *typical* coal-handling system. What we've tried to do in the chart above is break down the over-all operation into typical steps, explain the general function of each, and give some idea of the many ways they can be combined. And for each step, we've listed typical devices used.

How Chart Works. Before taking a look at some of the combinations diagrammed, let's be sure we know how it works. To make the over-all picture clearer, the chart divides it into steps or functions. Not all of these need be involved in any actual case. Nor will they always stand out clearly as separate operations — a single piece of equipment may, in practice, handle two or more of these functions.

The order in which steps are charted is close to that likely to be followed in many cases. But specific operations, such as preparation or weighing, may be handled at other points than those shown. Finally, while flow arrows indicate a great number of combinations, the chart cannot, in the nature of things, cover all of the many possible arrangements.

Within these limitations, however, the chart helps to show what's involved in this coal-handling job and thus serves as a useful introduction to discussions of functions and equipment that follow.

Simple Setups. Now let's look at some possible setups, see how conditions influence them, and how the chart pictures them. Simplest situation might be a basement plant in a city building, with coal received by truck. Truck dumps directly to a bin, from which a screw conveyor carries coal to a stoker. On the chart this would be 1c-6-7-9.

In another relatively simple setup, railroad cars discharge over a track hopper and a bucket elevator lifts coal to the plant bunker. From here it flows through chutes to stoker hoppers (1a-2-4-6-7-9).

Adding Elements. Now let's suppose the plant gets some more boilers and extends the bunker. To distribute along the length of the bunker we add a horizontal conveyor over it. This means more transfer equipment, although chart sequence is still 1a-2-4-6-7-9. But to improve operation we add coal scales. Then we have another chart step, and sequence is 1a-2-4-6-7-8-9.

To protect against major delays in shipments, we add an outdoor storage and a bulldozer for building the pile. To provide an initial pile for the dozer to work from we use a portable conveyor. The dozer reclaims to the track hopper. Then, when we're using the outdoor pile, the coal-handling sequence becomes 1a-2-5-4-6-7-8-9.

Complex System. Now, to give the chart a real workout, let's look at an actual system receiving coal by both water and rail. A coal tower unloads the barges and a conveyor carries coal to a crusher house (1b-2-4-3). A rotary car dumper unloads rail shipments to a hopper feeding another conveyor leading to the crusher house (1a-2-4-3).

The crusher house serves as a transfer point for routing coal into the plant or to a drag scraper for building an outdoor pile and reclaiming from it. So for direct handling into the plant the over-all lineup is: 1a-2-4-3-4-6-7-8-9 or 1b-2-4-3-4-6-7-8-9. When we're stockpiling and reclaiming, the procedure is 1a-2-4-3-4-5-4-6-7-8-9 and its equivalent for water shipments.

Many Combinations. While these examples are but a few of many possible arrangements, they're enough to show that each system consists of certain basic functions combined to meet specific job requirements and conditions.