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Purchasing & Store System of Saco- Lowell Shop, Newton Upper Falls, Mass.

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General remarks. The products of the shop consist of textile machineries, namely, Carding, Drawing and Evener Drawing machines. All products are standardized and they are manufactured on orders. The chief material used in the shop is pig iron, the others are, such, bolts nuts, wire, card clothing and steel sheets etc. which used for part constructions. The production per month is about 200 cards and 350 drawing frames. Number of employees varies from 700 to 800 , partly skilled and partly unskilled males of all nationalities.

They maintain one store room in the central part of the shop for general supplies and small parts used for machine construction. Pig irons are piled in the yard near the foundry and carried into the shop on the trucks. No store room for semi-finished goods is maintained but they are left in any available space of the shop. The finished goods are shipped out as soon as they are ready.

Purchasing. All purchases of the corporation is concentrated at the Boston office, under the purchasing agent whose duty is to supply materials required in the three plants of the corporation.

This concentration of purchasing under one authority

has many advantages. First; being all the purchasing orders come to him, it will enable him to place the orders in large quantities and obtain better terms. Second; can afford to employ high class man: if purchase is done at each shop, either must keep the purchasing agent for each shop or part of time of the superintendent must be devoted on this matter. Third; as he is given sole authority it is possible to hold him responsible. Fourth, being his office is located in the business center, can keep in the close contact with market conditions.

The concentration of all purrchases under on head is quite satisfactroy, though there are some disadvantages; such, difficulty of cummunication with shop and difficulty of familiarizing with the shop conditions on the part of the purchasing agent.

Purchase of pig iron & coal. Pig irons and coal are bought at discretion of the purchasing agent. As the average comsumption of the shop is known to him, generally orders are placed in such a way that deliveries be made at certain intervals. When fluctuation of markets is too much he uses his best judgement in placing orders. A complete record is kept, of monthly consumption, quantitiy ordered, receipt and balance etc. for his guidance.

When goods received at the shop, if there is any doubt

on quality and quantity, they are tested by foremen in charge; pig iron by foundry foreman, coal by the power house foreman.

Purchase of supplies. The supplies are purchased by request of shop. The purchasing requisition is originated by the store keeper, with approval of the superintendent, send to the purchasing agent. A close watch kept on the stocks by the stre keeper and when the stocks become low or when the store keeper feels to have more stocks he sends out requisitions. Two copies of requisition made, one retained by himself, the other is send to the office, where, again two typewritten copies of requisition made. The original copy from store keeper is retained by the book keeper for the purpose of checking up invoice, the other by superintendent and the third is send to the purchasing agent with signature of the superintendent.

The purchasing requisition of the store keeper is based on the store records and actual goods on hand. Analysis is made in the store records all articles required for the construction of each machine; its specifications, amount etc. By consulting ~~with~~ this records and by receiving advice from superintendent, the amount of outputs they intend to make in the coming months, the store keeper can estimate the kinds and amount of materials he must purchase. The difference between the goods on hand and goods required in

coming months is the amount he must prepare. The requisition for special materials required in the shop is originated by the foreman of the department and send to the store, from there it passes same routine as the standard materials.

As the work of the shop is repetitional, and because little changes in total output, the store keeper can fairly well foresee the requirement of month in month out, so, generally orders are placed to have monthly deliveries. However, this general practice can not be applied at this extrodinary time so they are getting materials all they can; in some line of materials they have obtained enough to last one year.

Receiving and Checking. All goods are directly received by the store keeper as they do not maintain a separate receiving department. Upon the arrival of goods the store keeper is required to check up goods with invoice and then with oder copy which he keeps in file. Actual counting of goods is seldom done, as it is confessed by the store keeper, it involves great extra labor on the part of the store attendants, generally seller's words are taken and counting is omitted. The invoice is compared with the order copy to see whether they have received more or less than they have ordered, however, a little discrepancy

is disregarded.

Inspection. There is no proper system of inspection. It is done by the store keeper in most cases but if he has any doubt on its quality or specification, it is send to the department foreman for test. In case the goods are unsatisfactory, the fact is reported to the purchasing agent at once and the matter is taken up by him with the dealer.

Store accounts & records. When goods are received and invoice is checked, they are charged to the accounts which will be the ultimate destinations of those goods; that is to say, if bolts or nuts are bought for the cards they are carried to the debits of the card account, instead of holding the store room responsible. Therefore, all goods in the store room are charged to some accounts when they are received and no entry is necessary when goods are issued from the store room.

No goods are issud without written requisition from foremen. This requisition is torn up and thrown into the waste basket as soon as goods are issued, and no pains are taken to keep record. The foremen are required to make entries in their stubbooks when requisitions are issued but seldom it is done. There is no way of knowing the cost and amount of goods issued from the store except by taking inventory; though, this will tell the amount disappeared

from the store it will not tell its destination.

The following is the form of the stock records kept by the store keeper; to the left of the form a few more columns are added, containing, name of articles, description and per unit required for construction of each machine.

MONTH OF 191

On Hand	Quan. Ord'd	Date	From Whom	To be Ship'd	Ship'd	Here	Rec'd for Month	Used for Month

The articles contain in this record are all standard articles and must be kept on hand constantly. The first column"On hand" is entered monthly balance, to this plus amount received during month minus "Used for month" will be new balance to be entered in the "On hand" of nest month. The last column "used for month" is peculiarly treated and need further explanation. The entry in this column is not made from actual issue but from theoritical issues. This theoritical issues are obtained by multiplying per unit required for each machine by the total outputs, so this is standard required and if no waste ever occured this theoritical issues must correspond with actual issues. On the other hand, if wastefulness occurs in the shop or within the store the figure will not agree so is the balance. In case discrepancy is great it will be investigated by the superintendent

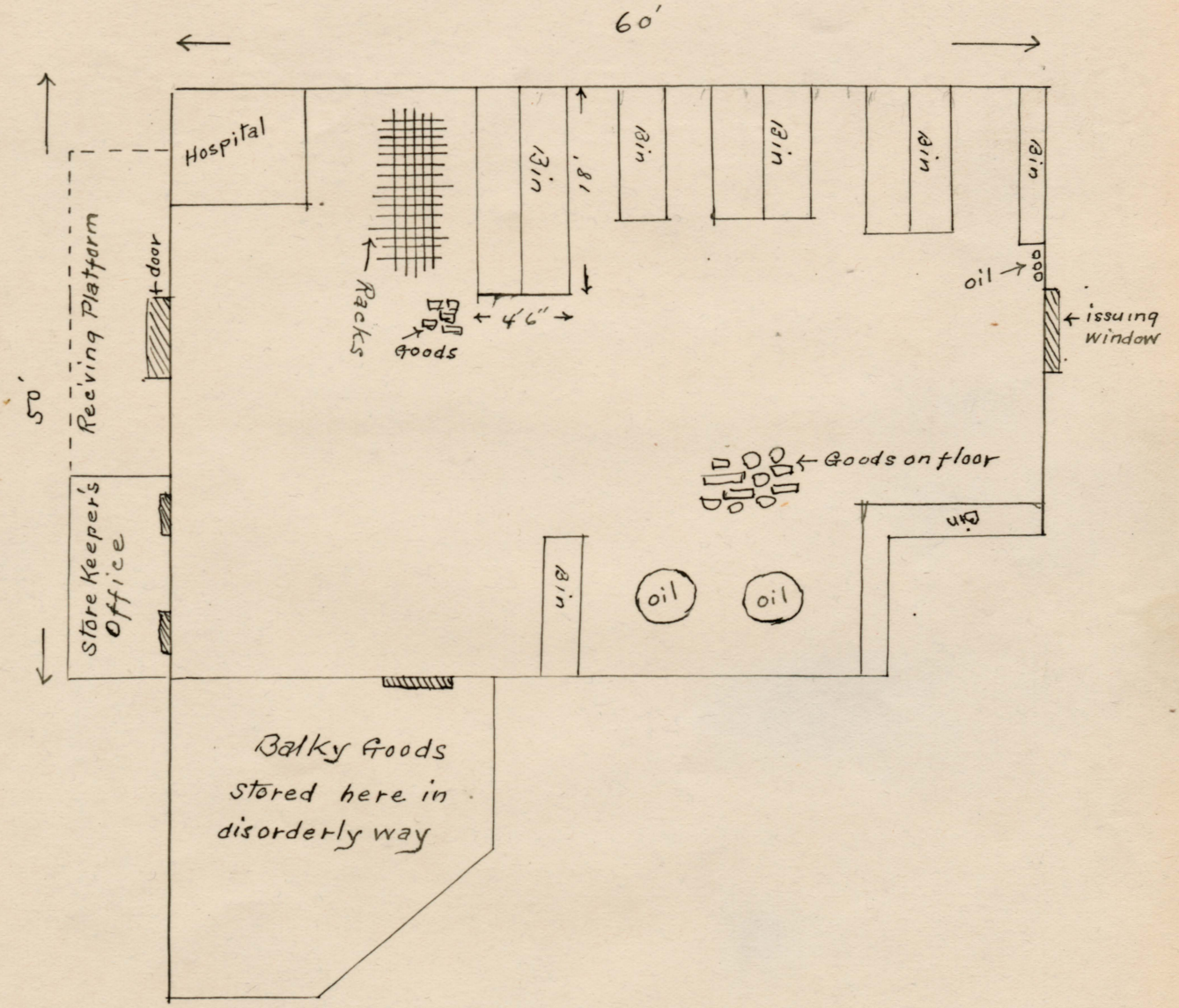
but it will be not very easy matter to trace it, because of no record of issues are kept. The store keeper supposed to check up goods every month but it is not done, only checking is done at the time of taking semi-annual inventory.

Inventory. Inventory is taken every 6 month and the book is closed.

Store room & its physical arrangement. The store room is located about central part of the shop, its dimension is about 50' x 60', excluding a small annex which used for balky materials; on one side there is receiving platform, on the other side is issuing window. The small materials are placed in the bins according to kinds while balky materials are laid on the floor without any idendification marks. Each bin bears name of the material it holds but no classifications or bin tags nor any index are used.

Virtually, all bins are of same size and no variation is made according to the balk of quantity of materials they hold. As the result, some bins are filled more than they can hold and extra goods are piled on the floor around the bins, while the other bins are nearly empty. Those materials which have frequent calls placed in easy reach of hands and the others are placed in the lower or higher bins.

The bird-eye- view of the store room is shown in the following page.


60'
50'
Hospital
Receiving Platform
door
Store Keeper's Office
Racks
Goods
13in
18"
4'6"
Bin
Bin
Bin
Bin
oil
issuing window
Goods on floor
Bin
oil
oil
Bin
Balky Goods stored here in disorderly way

Defects of system & its remedy.

A- Lack of self-sustaining:- The foundamental err of the store system is in the lack of self-sustaining; the system depends too much on the personality of the attendant, not ~~of~~ on the system itself. So long as the present store keeper stays and never tempted to accumulate wealth secretly there would be little trouble, but, if on the other hand, the good will of the store keeper ceases or in case he retires, the system requires tremendous supervision of the supperior officers. Only remedy to this is to install self-sustaining system which wll be discussed in the following paragraphs.

B- Danger of leaving purchasing orders in the hand of cheap help who lacks knowlege of business condition of the shop:- To avoid sending out orders often, he may be tempted to place orders in a larger quantity than actually needed, which may results in lacking up of unnecessary capitals. Again. as the monthly issues are assumption, not actual issues, the book balance will not tally with the goods on hand; if orders are based on the book balance, it may results in over or short purchases. As the maximum or minimum point is not fixed, experience is only guide for him to use best judgement which may not dependable under varying conditions. There is another unfavorable reason, that is, because of incomplete records no one can assume his place.

during his absence.

For above reasons, it is desirable to place purchase requisitions in the hand of the clerk in the office who comes in close contact with the superintendent; and store keeper's time should be devoted to some other duties, such as proper checking and recording etc. To enable a clerk in the office handle purchase requisitions and store accounts, the following form will be serviceable.

"Steel Bolts for Cards"

	Required		Ordered		Rec'd		On H'd		Issued		Apportioned		Available	
#1	5/10	1.000	3/30	500	5/1	500	5/1	500	5/10	.....	#1	500		—
			5/3	700	7/1	700	7/1	700	7/..	.....	#1	500		200
				1200		1200		1200	..	.....		1000		100
								1100	9/1	1100			9/1	100
							9/1	100						

To illustrate this elaborate scheme, we assume that production order for 1000 cards is taken by the company which we call order #1. By assuming one steel bolt is required for each card we must have total of 1000 bolts for this order, so we enter in the first column 1000. Later, purchasing requisition is send out for 500 bolts, this 500 bolts is not for any other job but for order #1, we enter this amount in both "Ordered" and "Apportioned" columns. ~~To~~ By following chronolgical order, next 500 bolts received, which must be

entered in the "Rec'd" and "On hand" cloumns. The issuing is already has started but we leave this aside for a moment and assume 700 more steel bolts ordered. Next, we must apportion 500 more for order #1 and bring its total to 1000 which is equal to required quantity; rest of 200 we put in the "Available" column which mean this can be used for some other order. Again, this 700 bolts received so we add to received and On hand columns, bringing both totals to 1200. By this time order #1 is finished total issue amounts to 1100 instead of 1000 which ought have been if there was no err in caluculation or no waste occured. The entry for this 1100 will be subtraction from amount on hand and amount apportioned; as we apportioned only 1000 we write off this amount and rest of 100 from "Available". As the balance stand now is 100 on hand and 100 available.

Balance on hand must agree with goods in the store room it must be checked by some one in the office not by the store keeper. If the bill of materials made up right, the amount required must check with amount issued, the difference will indicate the wastefulness of the department. Entries in the issued column be made every day from foremen's stub books, other columns entered once a week or when ever necessary; " "Required" column is entered from the bill of materials when the production order is taken.

By this method the store keeper will be relieved of great deal of mental work he can devote his time for better arrangement of store etc.

C- Lack of proper checking and inspection when goods are received:- When purchase requisition is originated and when he makes mistakes in specification, he may be afraid to dispose his err and store the goods in the corner of the room, though he knows they will be never used and count them as the assets when he takes inventory. Again, it is ridiculous to take the words of the dealers and omit the checking and inspection as it is practised by this shop.

To enforce actual checking and inspection, it is desirable to keep store keeper ingnorant of what is coming and ~~make~~ let him count and inspect and report exctly what he has received. This seems too radical but as the store is run rather loosely long time this would be only remedy.

D- Lack of proper records, classification; necessity of bin tags and index:- A peculiar method of keeping store records is all ready described. By their method it is almost impossible to know, whether discrepacy is due to wastefulness of shop or of store but by keeping store's balance sheet described above it will be easy to trace the cause.

To simplify the work of store keeper and store's balance sheet clerk it is desirable to keep bin tags and

entries be made at the time of issue and receipt. The entry in the bin tags made independently from store requisitions and receipt of goods, yet this must tally with balance sheet kept in the office, so any err can easily be found.

The proper classification and index are desirable to put stores in good condition, however, this can be omited as the materials are not so numerous.

E- Lack of proper responssibilities on the part of the store attendants;- This is noticeable by the facts that no checking, no inspection, no record of issue and neclection of monthly checking. By application of system above described this problem will be solved without any difficulty. When proper records of stores are kept in the office it is not easy matter for any one to meddle them.

F- Necessity of proper arrangement of bins, selves and racks;- Without any figuring it will be noted that floor space occupied is more than actually needed. By adding a few shelves, bins and racks it would be unnecessary to pile the goods on the floor in disorderly way. It is my estimation that two thirds of total floor space will be sufficient to store goods in proper condition. The bins should be cut into different sizes according to the balk and demand of materials.

G- Improper way of handling store accounts:-
When goods are received, general practice is to debit the store, when goods are issued, the store is credited and the job or manufacturing account is debited. In the case of this shop, debiting of store is entirely omitted and goods are directly charged to the manufacturing accounts. This short cut method is neither logical nor proper way of keeping cost. It is unfair to hold manufacturing account responssible while goods still remain in the store, it is the store who is responssible until issued them in proper condition. In case store keeper makes private disposition of goods or destroy them by careless handling, who will suffer? Apparently by this system manufacturing accounts will suffer while it is no fault of ~~it.~~ theirs.

As the works are repetitional and doing same thing over and over again, it does not matter whether the cost is kept on the basis of each order or on the basis of of standard products, but, it is desirable to make clear distinction of responssiblities, so that, efficiency and defficiency can be distinguished from carefulness and careleness of the store room.

Final conclusion:- The shop is not controlling material. This loosely run store system is reflection of general condition of the shop; in order to install new system in the store, it is necessary to bring certain change in management.

Tool Room System.

Throughout the shop the machines are grouped accord- to their fanctions; that is, all milling machines are agregated in one place, drills in the other place and planers in still another group etc. Therefore, tools used particularly for specific machines, kept in the racks nearby the group of machines; for instance, all milling tools near milling machines, drills by drilling machines. No other tool room is maintained.

Both group of machines and tools belong to that group are under supervision of sub-foreman, he must see they are kept well.

No regular inspection or checking system is installed. When a workman wants any tools he can get from subforeman when he is through returns to him. If tools need repair sub-foreman report matter to the foreman and sends the tools to the repair room where all repairs of machines and tools are done. Expenses incured for repairs charged to the machine-tool repair account in the lump sum.

Records of date bought, cost and date of installation are kept only for larger tools, not for any small tools.

The milling tools and drills are ground to the standard shape by the regular grinders; lathe tools ground by the individual workman, if he is new man foreman must look after him. There are certain standard shapes for lathe

tools and the workmen are required to maintain prescribed shapes. However, this is not very strictly enforced.

There is one advantage in this system, that is, tools are always kept in easy reach of workmen so no messenger is needed and little time is lost by going forth and back to the tool room, if all tools are kept in one place.

Disadvantages are numerous; less accountabilities on on the part of the workmen, difficulty of keeping in the good shape because of no inspection, difficulty of keep-track of tools and difficulty of enforcing standard shape as they are ground by individual workman.

In this shop, it is not very advantageous to keep central tool room, but it is desirable to provide a regular grinder for lathe tools and the others. Also it desiable to install a regular inspection system. This should be done outsider not by the foreman or sub-forman.