

ELEMENTS OF MINE ACCOUNTING.

A THESIS.

SUBMITTED TO THE FACULTY OF THE COLLEGE OF ENGINEERING  
IN CANDIDACY FOR THE DEGREE OF  
MINING ENGINEER.

( Mackay School of Mines )

By

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## PREFACE.

One of the outstanding features of the criticism of College graduates is their lack of Business Training. Especially is this true of Mining and Technical students. This point was early brought home to me in my experience following graduation and it has been impressed more and more as the years have passed.

Realizing that an extensive course in Economics is not permissible in the limited time allotted to undergraduate work, in engineering schools, I have for some time considered various methods which might be introduced to give every graduate engineer a basic understanding of the business side of mining.

Inasmuch as Accounting is essential to all forms of business a good working knowledge of this subject appeals to me as being the logical angle from which to undertake this problem.

A survey of the technical books on this subject reveals some excellent references for those advanced in commercial technique, but in no case have I found an elementary treatise on Mine Accounting. It was my purpose therefore in undertaking this work to present the subject in a form which would be easily understood by the student and serve as a ready reference for those engineers whose practical experience may have led them into other fields than those of the executive. I regret that lack of time has prevented me from carrying out my original plan of designing a model set of accounts to be worked out by the student and also including numerous tables of value in computing costs.

Acknowledgement is made for many valuable suggestions and for having drawn freely from the information contained in American Mine Accounting by Charlton, from the Book-keeping course of the I.C.S. and from the various mining companies with which I have come in contact. Most of the forms presented are those which I have found useful in my own experience with several mining and industrial concerns. Some are original, but all are evolved from those which I have considered most practical. There has been no attempt to illustrate them all; to do so would involve infinite time and labor. That all of those contained herein will apply in every case is not claimed, but it is hoped that the suggestions they offer may be useful in solving some of the local problems of other engineers and in laying a foundation for a better understanding of this most important factor of the economics of the mining industry the "Business Side".

F.D.B.

## INTRODUCTION.

The basic principle for the establishment of all business is to realize a profit. It will be well to bear this in mind when installing an accounting system; for many auditors in their zeal to analyze costs have lost sight of this fundamental idea and have devised such involved methods for recording their information that they have needlessly augmented the costs which they started out to set down.

The primary consideration in all forms of accounting, whether for mining, manufacturing or other industrial pursuits is to record the cost of doing things and from that to determine the Profit on the business. With this idea in view it is proposed to take the reader through the various steps in the work of a Book keeper that he would naturally follow in the line of promotion with any well organized company, progressing through the positions of Timekeeper, Stores clerk, Mine accountant, Cashier, Auditor and Secretary of the company. By assuming the work as that for a small company he is supposed to cover the first three positions at one time. The last three come more within the realm of the Expert Accountant and will not be described in such detail. The engineer, for whom this treatise is originally designed will have changed his course before that point is reached, whereas the man who expects to specialize in accounting will find advanced books on the subject.

TIME KEEPING.  
LABOR ACCOUNTS.





TIMEKEEPING.

The primer of bookkeeping is the "Timebook". Most of us are familiar with the ordinary forms, such as shown in Fig. 1. These serve for the preliminary or field record of the employee's labor. In cases where the laws require semi-monthly paydays, a similar form ruled with 16 days may be used, but for all practical purposes the standard "Monthly" book has been found to serve fully as well. On small properties, employing thirty men or less, the monthly book may be utilized for the entire time record, until transfer is made to the "Payroll".

Task	Time	Day	Total
Smith John	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	15	4 <sup>00</sup> 60 00
Crushing	2 4 2 3 2 3 2 3 2 2 2 4 2 2 3	15 38 H. 4 <sup>5</sup> / <sub>8</sub>	60 00 19 00
Tube Milling	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ 1 1	41 9 1 <sup>1</sup>	20 50 4 50
Concentrating	4 2 $\frac{1}{2}$ 3 4 2 3 4 3 4 $\frac{1}{2}$ 4 3 4 3 4	48 6-	15 00 24 00
Settling	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1 $\frac{1}{2}$ -	4 37. 9 1 <sup>1</sup>	18 50 4 50
Mill General	1 2 1 $\frac{1}{2}$ $\frac{3}{2}$ 1 -	9 10 12	4 50 5 00
Stages	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1	2 3 1 3 1 1 1	6 00 3 00
	2 1 1 1 1	6	3 00

Fig.2. Method of carrying segregation of employees' time in ordinary Time book. Note that by proper spacing the two half month periods may be recorded on one page.

MONTHLY AND WEEKLY.

Large construction jobs usually employ a timekeeper whose duty it is to make the rounds of all work, twice daily, and tally each man by name or number. In well organized manufacturing or mining concerns, the employees are of a more permanent class known more or less intimately by their department foremen, and their time is checked by the latter. Modifications of the forms presented will make them applicable to almost any similar institution.

A word of caution should be given here to those installing this system of timekeeping for the first time. Some bookkeepers expect the workmen to take out these cards to show the foreman accounts properly charged with their time. A little knowledge of working men reveals to us that the simpler the card, and the less they have to think about it, the more successful will be the results.

It has been found that the most practical way to handle this system is to require the man to state in a few words, like those in the illustration, just what he did and the time consumed in the work, leaving to the foreman to determine the account to be charged. The average man, though he may be meticulous and careful in his own work, rebels at the idea of "keeping books" as he terms this distribution of his time, and the less his mentality is taxed the less liable he is to confuse accounts.

I have seen books kept in construction work but to put in their time on a complicated card only to have them fill it out all wrong or with as little as their own services, turning

TIME TICKETS OR TIME SLIPS. From the general manager's view.

The modern method of recording the time of mechanics or other employees whose work is divided between numerous jobs during the day is by means of the "Time Slip". These tickets are made out by the workmen themselves and deposited in a locked box to be collected daily by the foreman, shift boss or master mechanic in whose department they are working. They are usually "okehed" by the latter, turned in to the local office, and posted directly to the payroll, or entered in the foreman's time book for future reference.

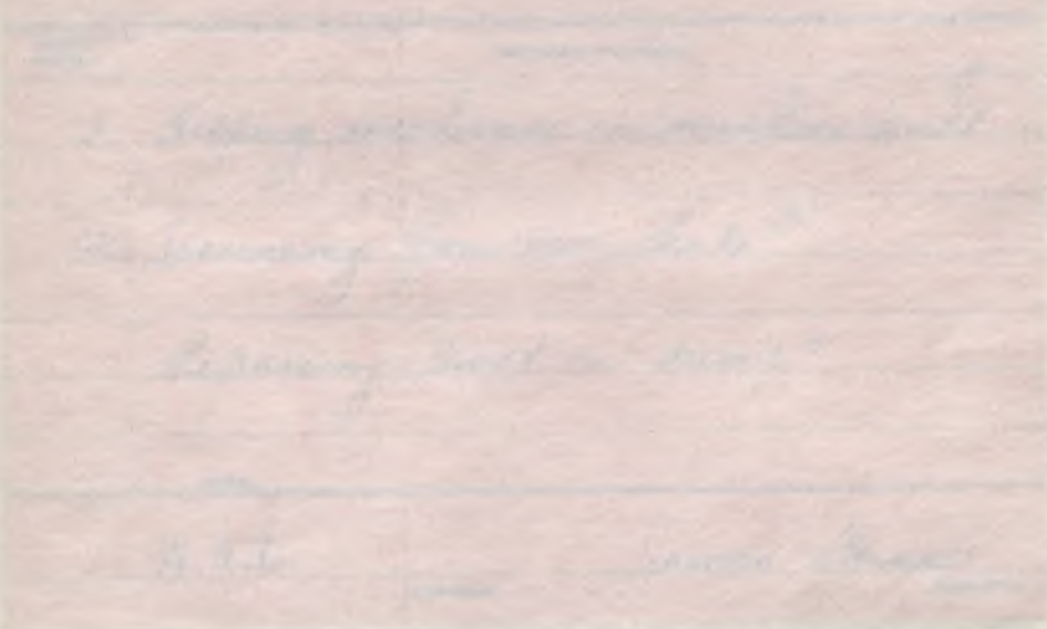
A word of caution should be given here to those installing this system of timekeeping for the first time. Some bookkeepers expect the workmen to make out these cards to show the various accounts properly charged with their time. A little knowledge of working men reveals to us that the simpler the card, and the less they have to think about it, the more successful will be the results.

It has been found that the most practical way to handle this system is to require the man to state in a few words, like those in the illustration, just what he did and the time consumed in the work, leaving it to the foreman to determine the account to be charged. The average man, though he may be systematic and careful in his own work, rebels at the idea of "keeping books" as he terms this distribution of his time, and the less his mentality is taxed the less liable is he to confuse accounts.

I have seen hours spent in instructing men how to put in their time on a complicated card, only to have them fill it out all wrong as soon as left to their own devices, causing

discussion and disturbance from the general manager down. Whereas, a simple slip and a little time spent in explaining the accounts to an intelligent foreman, and the reason for charging certain items to their several heads would have solved the problem in the beginning.

In the case of Employees who have regular assignments, requiring distribution of their time to the same accounts daily, the record of work done is entered in the time book directly without the tickets.



REPRODUCED FROM THE OFFICIAL RECORDS OF THE NATIONAL ARCHIVES AT COLLEGE PARK, MARYLAND. REFERENCE TO THE ORIGINAL SOURCE IS REQUIRED FOR PROPER CITATION.

**DAILY TIME SLIP**

DATE 4-14-19  
SHIFT 3

HOURS WORKED	NATURE OF WORK
3	Helping mechanic on machine drill <sup>A.</sup>
4	Tramming from #4 chute <sup>O.T.</sup>
1	Repairing track on dump <sup>S.</sup>
TOTAL	
W.A.E.	James Dunn
FOREMAN	EMPLOYEE

Fig.3. Time slip or ticket which the workman makes out at end of each shift. The initials are the foreman's classification.

## PAYROLLS.

The payroll is the monthly, semi-monthly, or weekly statement of the labor account. It is a summary of the individual accounts in the time book, together with the deductions for Board, Hospital or other charges against each employee.

It was usual, formerly, to omit the names of the Superintendent or other executives, when it was the custom to require the signature of employees as receipts for payment; but with the advent of the "Voucher Check" and acceptance of cancelled "Checks" legally as receipts, signatures are no longer necessitated.

There appears to be little argument for omitting any of the department heads under the latter conditions; since "time" is properly segregated under the head of "Labor"

In the case of General Superintendent or Manager, these higher officials' salaries are often classed under Overhead or General Expense, to be distributed later. Their salaries are accounted for by separate voucher.

A convenient form of payroll for this system is given below. It will be noted that neither the daily time record nor signature column are included, this with a view to save time in accounting and to provide a more convenient size.

PAYROLL OF

MONTH OF *March 1919*

NAME	OCCUPATION	SHIFTS	RATE	AMOUNT	DEDUCTIONS			Total Deduct.	AMOUNT RECEIVED.	CHECK NO.
					BOARD.	HOSPITAL	Safety Loan			
<i>own E.R.</i>	<i>Mine Supt.</i>	<i>30</i>	<i>10.00</i>	<i>300.00</i>	<i>—</i>	<i>1.00</i>	<i>30.00</i>	<i>31.00</i>	<i>269.00</i>	<i>432</i>
<i>nes J.L.</i>	<i>Mill "</i>	<i>30</i>	<i>10.00</i>	<i>300.00</i>	<i>40.00</i>	<i>1.00</i>	<i>20.00</i>	<i>61.00</i>	<i>239.00</i>	<i>433</i>
<i>icson L.V.</i>	<i>Book-keeper</i>	<i>30</i>	<i>20.00</i>	<i>200.00</i>	<i>40.00</i>	<i>1.00</i>	<i>—</i>	<i>41.00</i>	<i>159.00</i>	<i>434</i>
<i>ason S.A.</i>	<i>Maat Mech.</i>	<i>30</i>	<i>10.00</i>	<i>300.00</i>	<i>40.00</i>	<i>1.00</i>	<i>20.00</i>	<i>61.00</i>	<i>239.00</i>	<i>435</i>
<i>ack J.C.</i>	<i>Pass Carpenter</i>	<i>29</i>	<i>6.00</i>	<i>174.00</i>	<i>—</i>	<i>1.00</i>	<i>10.00</i>	<i>11.00</i>	<i>163.00</i>	<i>436</i>
<i>ith Geo</i>	<i>Carpenter</i>	<i>30</i>	<i>5.00</i>	<i>150.00</i>	<i>40.00</i>	<i>1.00</i>	<i>—</i>	<i>41.00</i>	<i>109.00</i>	<i>437</i>
<i>nson J.</i>	<i>"</i>	<i>28</i>	<i>5.00</i>	<i>140.00</i>	<i>40.00</i>	<i>1.00</i>	<i>5.00</i>	<i>46.00</i>	<i>94.00</i>	<i>438</i>
<i>cker L.S.</i>	<i>"</i>	<i>25</i>	<i>5.00</i>	<i>125.00</i>	<i>—</i>	<i>1.00</i>	<i>—</i>	<i>1.00</i>	<i>124.00</i>	<i>439</i>
<i>thurs D.O.</i>	<i>Mine S. Pass</i>	<i>30</i>	<i>6.00</i>	<i>180.00</i>	<i>40.00</i>	<i>1.00</i>	<i>10.00</i>	<i>51.00</i>	<i>129.00</i>	<i>440</i>
<i>nes M.M.</i>	<i>" "</i>	<i>30</i>	<i>6.00</i>	<i>180.00</i>	<i>—</i>	<i>1.00</i>	<i>10.00</i>	<i>11.00</i>	<i>169.00</i>	<i>441</i>
<i>cker J.K.</i>	<i>" "</i>	<i>30</i>	<i>6.00</i>	<i>180.00</i>	<i>—</i>	<i>1.00</i>	<i>20.00</i>	<i>21.00</i>	<i>159.00</i>	<i>442</i>
<i>icks J.</i>	<i>Miner.</i>	<i>26</i>	<i>5.00</i>	<i>130.00</i>	<i>40.00</i>	<i>1.00</i>	<i>10.00</i>	<i>51.00</i>	<i>79.00</i>	<i>443</i>
<i>iggins M.J.</i>	<i>Timberman</i>	<i>20</i>	<i>5.50</i>	<i>110.00</i>	<i>30.00</i>	<i>1.00</i>	<i>—</i>	<i>31.00</i>	<i>79.00</i>	<i>444</i>
<i>wis Tom</i>	<i>Miner.</i>	<i>10</i>	<i>5.00</i>	<i>50.00</i>	<i>14.00</i>	<i>1.00</i>	<i>—</i>	<i>15.00</i>	<i>35.00</i>	<i>445</i>
<i>ansen Ale.</i>	<i>Shoaler</i>	<i>30</i>	<i>4.50</i>	<i>135.00</i>	<i>40.00</i>	<i>1.00</i>	<i>5.00</i>	<i>46.00</i>	<i>89.00</i>	<i>450</i>
<i>ranson John.</i>	<i>"</i>	<i>30</i>	<i>4.50</i>	<i>135.00</i>	<i>40.00</i>	<i>1.00</i>	<i>10.00</i>	<i>51.00</i>	<i>84.00</i>	<i>451</i>
<i>hite Jas.</i>	<i>Millman</i>	<i>24</i>	<i>5.00</i>	<i>120.00</i>	<i>37.00</i>	<i>1.00</i>	<i>—</i>	<i>38.00</i>	<i>87.00</i>	<i>460</i>

Fig. 4. Payroll for use when payments are made by check.  
Size of sheet 8½" X 14" (Double invoice size)



The older type of payroll and one still frequently used, contains the detail of each man's service including the total number of hours for each day. The wide sheets necessary for recording so much data make it unwieldy for filing and the progressive accountants are rapidly replacing them with the narrower statement illustrated.

Having transferred each employee's total time to the proper column opposite his name, the next step will be to consult the other record books for such items as may be found charged against him. There are a few of these which are more or less standard. They are:

Board  
Hospital  
Commissary  
Advances

In some cases several or all of these may be omitted. Where the company does not run a boarding house, or commissary, it is obvious that these items would be unnecessary. Collections for Hospital or Doctor are prohibited by statute in some states, and many companies make it an unbreakable rule that no advances be made before the regular payday. This can be carried out quite satisfactorily where weekly paydays exist, but the progressive companies are inclined to adopt a more liberal attitude toward their workmen, and will issue them a reasonable amount of the money due for labor, upon request, until after the first payday. This is a policy which is not only commendable from the humanitarian view point, but is a measure for promoting a better feeling between the employer and employee.

A separate account is kept for the boarding house, which

is controlled by local conditions. The individual accounts are figured and totals transferred to the payroll the same as from the time book. Extensions are then made to their proper columns and footing totals brought down.

A detail worthy of mention here is the method of posting the names. Two general systems are followed either of which are good. The one to be adopted depending entirely upon its application to the particular case.

Where industrial insurance applies, and it is required to classify the men into groups for different ratings, it will be found convenient to make this classification at the time of posting, in order that the reports may be taken off more readily when the proper time arrives. For example, office help, miners, carpenters, mill men or mechanics will be grouped under each of these occupational heads, so that totals for each group may be taken directly from the Roll without transcribing each amount to another sheet.

The other method is to arrange the names alphabetically, usually in circumstances where there is a paymaster, or the checks are issued by a cashier, or bookkeeper other than the local office.

It is well for the local accountant to bring down all totals and to figure averages where possible. This information, besides being useful for statistical data, furnishes an excellent check on his work.

Having completed this much of the labor account, it is ready for issuance of the pay checks, and may be laid aside until time is available to make up the distribution and carry the various charges to the "back". This part of the work will be taken up again under "Segregation of Costs."

The storehouse or "stuffer" as it is more commonly called is the clearing house for all supplies entering into the manufacture of the product. It is the distributing agency thru which the manufacturer secures an accurate check upon the material consumed in each department or branch of the business. As the name implies it serves to provide means for supplying a surplus of those materials in constant demand and such repair parts or machinery that may be needed upon a moments notice to keep the plant in operation.

The magnitude of the stock depends upon the scope of the operations and the nature of the equipment. It may vary from a few hundred dollars for the small developing office to six figures for the operating property of large testing outfits. Considerable judgment should be exercised **STOREROOM**, the storehouse stock. While it is inadvisable **ACCOUNTING** of money for inactive equipment or supplies, it is always well to bear in mind the seriousness of an idle plant or office of a single unit. The breaking of a part of any important machine may result in suspending operation of a large section of the plant for days. In the large concerns such important single units generally have <sup>or</sup> duplicated already accumulated for replacement in addition to a stock of the smaller, easily broken parts. Experience is paramount in deciding to what extent the concern must go in their investment in "extras". Consultation should always be had with the superintendent or department head when it comes to such matters. In ordering minor supplies such as bolts, nuts, nails or other materials of daily issue the storekeeper will be able to refer to the old records to determine the average consumption, besides his orders upon such supplies. It is obvious that one of the

## STORES

The Storehouse or "Stores" as it is more commonly called is the clearing house for all supplies entering into the manufacture of the product. It is the distributing agency thru which the accountant secures an accurate check upon the material consumption of each department or branch of the business. As the name implies it serves to provide means for supplying a surplus of those materials in constant demand and such repair parts or machinery that may be needed upon a moment's notice to keep the plant in operation.

The magnitude of the stock depends upon the scope of the operations and the nature of the equipment. It may vary from a few hundred dollars for the small developing mine to six figures for the operating property of large tonnage output. Considerable judgment should be exercised in the selection of the storehouse stock. While it is inadvisable to tie up large sums of money for inactive equipment or supplies, it is always well to bear in mind the seriousness of an idle plant or often of a single unit. The breaking of a part of any important machine may result in suspending operations of a large section of the plant for days. In the large concerns such important single units generally have ~~extra~~<sup>or</sup> duplicates already assembled for replacement in addition to a stock of the smaller, easily broken parts. Experience is paramount in deciding to what extent the concern must go in their investment in "Extras". Consultation should always be had with the superintendent or departmental head when it comes to such matters. In ordering minor supplies such as bolts, nuts, nails or other materials of daily issue the storekeeper will be able to refer to the old records to determine the average consumption, basing his orders upon such averages. It is obvious that one of the

qualifications of a good stores accountant is a knowledge of mechanics<sup>1</sup> equipment. For that reason it is often found more advantageous to employ a clerk trained in mechanics rather than an outright book keeper for the storehouse work. Other requisites for this position are alertness, a good memory, attention to details and above all interest in and faithfulness to ones work.

The state  
 authority for such an  
 authority for such an  
 less costly  
 of such an  
 for the purpose.

REQUISITIONS

This term has been confused to some extent by its application to two forms in general use in stores accounting.

The first of these forms is the "requisition" of the storekeeper upon the Manager or Purchasing agent for new stock. It is in fact the storehouse "order" for material. It will be taken up more in detail under "Purchasing".

The second form is the requisition upon the "Storekeeper for supplies to be used in some department of the work. It may be issued by a foreman or department head or by the storekeeper himself. This usually depending upon the number of men employed and the nature of the work. In the larger establishments material is drawn from the stores through the foreman, who then knows for what it is being used. These requisitions correspond to the "sales slip" of the department stores in serving as the temporary record of the delivery of stock. To distinguish them from the first form they will in this work be termed "Delivery Slips". They should always contain

- The date
- Quantity and name of article
- Description of article
- Place used
- Name of person responsible
- for its issuance.

Two good practical forms are shown in Figure 5,

No. ....
191

**STOREKEEPER:**  
PLEASE DELIVER TO BEARER THE FOLLOWING

QUANTITY	ITEM AND WHERE USED	

NO. ....
191

**STOREKEEPER:**  
PLEASE DELIVER TO BEARER THE FOLLOWING

QUANTITY	ITEM AND WHERE USED	

For use in \_\_\_\_\_

Foreman

Fig. 5. Storehouse requisition blanks.

The stores clerk will find it advisable to see that these slips contain all of the information above, even if he has to assume a belligerent attitude to accomplish it. The importance of it will be seen in the following.

At the end of every month these slips are segregated, the price of the articles entered and each account charged with the proper total. The quantities and values are likewise deducted from the stock records for each item and the credited accounts balanced against the segregated charges. Where the "delivery records" are properly made out and the full data covered, it is a comparatively simple task to check and total them. If through inadvertence or otherwise there has been an omission on the slips, with the date and name of person drawing the supplies recorded, it is still possible to trace it through the time cards for that date. This failing, either the workman or foreman will usually remember the occasion and disposal of the article.

As the purpose of this discussion is to propose a direct and simplified method of accounting, a short description of a system of expediting this work may not be amiss.

Segregate all delivery records into the departments to which they are charged. Then under each department assemble the slips covering the same article. Total each of these and add all for the total of the account. Transfer the totals to the stock cards or stock books indicating the account charged thereon. A summation of these accounts can be made from the cards later. These sums should then check the like amounts when the slips are totaled.



## STOCK CARDS

Two systems of stock records are in use. The first is the employment of loose leaf ledgers. Ordinarily one page is assigned to each article. This saves confusion and gives ample room for extensions, new purchases and issues. The objection to the use of books of this kind is the unwieldy proportions to which they grow when large assortments are carried <sup>in the</sup> with storehouse, making them extremely awkward to handle.

The other system is the use of "stock cards". These may be ruled the same as the books above described. They can not of course contain so much detail as the books in the limited space available, but by condensing the least important items, practically all the information required may be pasted thereon. The chief criticism raised against this form of accounting is the liability to loss of the card. However in any well regulated office there seems little room for such argument. A clerk careless enough to misplace or destroy his record-card might as easily lose an entire book. The advantages of the card are many. It adapts itself readily to any kind of file or container. It files vertically in a drawer for quick reference. It is easily indexed and easily removed or transferred to another file. When pasted it lies flat on the desk and is not elevated as the page of a thick book. There are no ring holes to tear out or binder mechanisms to adjust. When filled it may be stored in a comparatively small space and is more accessible for later reference. The illustrated form is one which has given satisfactory service. (Figure 6).

STOREHOUSE RECORD		ARTICLE <u>Machine Bolts</u>					
		DESCRIPTION <u>1/2" X 4"</u>					
Date	Firm or Requisition No.	Quantity	First Cost	Freight, Express, Hauling	Ledger Value	Unit Cost	Charge
1919	P.H. & S.	100	2.00	1.50			
	Rev. Transf.			.50			
	Sal. old stock	10	.40		4.40	.04	
May	T.M. 2-6-21	12					.48
	PL. 3-9-13	6					.24
	Com. 12-6-9	3					.12
June	Bal.	89			3.56		

Fig. 6. Storehouse Record card posted as in use. Illustration shows initials of firms from whom purchases were made. This reference may be by Invoice Number as well. Red initials stand for the accounts to which supplies were issued and the figures for the Storehouse requisition numbers.

It will be noted that the credits or deliveries from stock are entered in red while the debits or receipts are in black. The advantage of this system is in the saving of columns and consequent reduction in width of the page. The more elaborate double entry systems are just as effective, but involve more paper, more ink and more labor. When all the Delivery records are posted to the stock cards the latter are balanced as seen in Figure 6 and the values transferred to the Storehouse Statement, (Figure 9) which is totaled and mailed to the main office. Accompanying this statement or backed on the outside is the distribution of the contained charges. (To be referred to again under "Segregation of Costs").

The Storehouse Clerk will note the debits of various articles and posting his stock cards, as "order-book" consisting of one statement of each day in which he sets down the items as they come to his attention. The usual practice is to place orders for articles once a week and other items for which there is no regular order may be included in the week list. This is done so that the purchasing department may, in order to receive the best advantage of freight rates on the larger quantities. Figure 7 shows a statement of a form supplied by the manufacturer in which the items are listed in full for the week's supply. The first page is filled in shortly after the order is placed and the other pages are filled in as the items are received. The invoice from the manufacturer is attached to the bottom of the page for the week's supply. The items are listed in full for the week's supply. The first page is filled in shortly after the order is placed and the other pages are filled in as the items are received. The invoice from the manufacturer is attached to the bottom of the page for the week's supply.

(COMPANY NAME)

PURCHASING

The tendency in buying is toward purchasing through a central office or purchasing agency. This practice is growing rapidly. As the mining business becomes more concentrated, the larger corporations as a matter of economy find it advantageous to employ a purchasing agent who establishes a department for handling all of the parent company's business. The subsidiary concerns send their orders to this department, which through its larger purchasing power and developed facilities obtains a much lower price for the articles ordered.

The requisition (Figures 7 and 7A) formerly mentioned, is the medium for making known the wants of the local office. It is designed to save labor. The Stores clerk will note the depletion of various articles when posting his stock cards. An "order-book" consisting of any standard blank form may be utilized to jot down "wants" as they come to his attention. The usual practice is to place orders for staples once a month and other items for which there is no particular hurry may be included in the same list. This is done so that the purchasing department may, in so far as possible, take advantage of freight rates on the larger shipments. Figure 7 is an elaboration of a form rapidly becoming a standard in manufacturing establishments and is ideal for the mining company. The first page as noted is shorter than the copies. It is the order to the Vendor to be signed by the Manager or Purchasing agent. The instructions and spaces for notations at the bottom of the copies are for the purchasers use, therefore unnecessary on the original. In using this form of requisition or order the procedure is as follows.

The Stores clerk fills in the date, shipping point, consignee or buyer, name of article or articles required and time of delivery following the instruction at bottom of duplicate copy. The name of

ORIGINAL

(COMPANY NAME)

REQ NO.  
ORDER NO.

(DATE)

TO \_\_\_\_\_  
GENTLEMEN: PLEASE SHIP BY (Express, Freight, Parcel Post) VIA \_\_\_\_\_

TO \_\_\_\_\_ ADDRESS \_\_\_\_\_  
THE FOLLOWING

QUANTITY	ARTICLES AND DESCRIPTION	DELIVERY	
		FOR WHAT PURPOSE	PRICE F.O.B.

Fig. 7. Combination Requisition and Order blank (Original)  
This sheet is usually white.

PLEASE COMPLY WITH THE FOLLOWING DIRECTIONS:

- Acknowledge order as soon as received and advise of delays or shortages.
- Mail invoices in Triplicate with bill of lading on day of shipment.
- Refer to Order number on Invoices, Shipping receipts and Correspondence.
- Mark order number on all packages.
- Do not substitute on this order until this office is consulted.

GENERAL MANAGER.

PLICATE.

REQ. NO. 25  
ORDER NO.

(COMPANY NAME)

(DATE)

GENTLEMEN:

PLEASE SHIP BY Express, Freight, Parcel Post. VIA

ADDRESS

THE FOLLOWING

DELIVERY.

RECEIVED	QUANTITY	ARTICLES AND DESCRIPTION	FOR WHAT PURPOSE	PRICE P.O.B.
----------	----------	--------------------------	------------------	--------------

BY

Fig. 7 a. Combination Requisition and order blank ( Duplicate)  
The Triplicate and quadruplicate sheets are identical,  
except they are different colors.

DATE	VENDOR'S ORDER NO.	INVOICE AMOUNT	CHECK NO.	FREIGHT CHARGE	CHECK NO.
------	--------------------	----------------	-----------	----------------	-----------

ORDER COMPLETE

INVOICES "

FILE NO.

INSTRUCTIONS-

MAKE A SEPARATE ORDER FOR EACH CLASS OF GOODS.  
GIVE FULL DESCRIPTIONS WITH CATALOG REFERENCES.  
SEND SKETCH WHEN A SPECIAL ORDER.

BY

STOREKEEPER.

APPROVED

SUPERINTENDENT.

the Vendor is left blank. All copies are sent to the Purchasing Department but one. The one is retained as a temporary record for storehouse use. When the purchasing agent sends the order he inserts the name of Vendor and price quoted on all copies, returns one to the storehouse and one to each of the other departments necessary, retains his copy and mails the original to the Vendor. It is not necessary through this operation to rewrite the order. The record at the bottom is used at the storehouse. The spaces for x several entries are to be used when the supplies are not received altogether or when separate invoices are received. Where this method is followed up closely it is not possible for an invoice to be passed for payment a second time, which occasionally occurs where large numbers are disposed of regularly.

The copy returned to the storehouse becomes the permanent record. It is attached to the invoice along with all other correspondence in connection with the transaction and filed away when posted in the local ledger.

The idea of "aggregation" which is to be dealt with later, the items ordered to stores are noted and the quantities, value and value transferred to the Stores Record Cards is made up. All entries having been made on the cards from the invoices the "credits" practically mentioned follow leaving them ready to be posted and also for the month. This accomplishes the statement (or the) of the main classifications is made for the month and sent to the office. Again it is manifest that a high degree of flexibility must be given to such classifications.

This statement issued monthly by each company is in my opinion an unnecessary refinement. It is in effect a detailed monthly inventory of the stores account and supplies. I stated that such a

INVOICES

The modern business invoice has been well standardized as to form. It is still to be improved upon in its size, but this will probably come about as the demand for standardization becomes more insistent. The illustration, Figure 8, is the reverse side of an invoice with the storekeeper's "backing". Two or more copies of the invoice are always requested, one of which is mailed to the main office or ~~cashier~~ <sup>cashier</sup>, the other retained in the local files. It is the practice now when dealing with reputable firms to check up the invoice prices, quantity, size of goods and if the extensions are correct, pass for payment immediately in order to take advantage of all cash discounts. Such business houses are always ready to make reasonable adjustments in case of error or dissatisfaction in their sales. The decision as to the advisability of immediate payment usually rests with the local superintendent.

Figure 8 illustrates an invoice containing items for the Stores account and some to be used directly in Construction work. It exemplifies the idea of "Segregation" which is to be dealt with later. The items charged to Stores are now noted and the quantities, sizes and values transferred to the Stores Record Cards in black ink. All debit entries having been made on the cards from the invoices the "Credits" previously mentioned follow leaving them ready to balance and close for the month. This accomplished, the statement (Figure 9) of the main classifications is made for the month and sent to the main office. Again it is manifest that a high degree of flexibility must be given to such classifications.

This statement issued monthly by some companies is in my opinion an unnecessary refinement. It is in effect a detailed monthly inventory of the stores account and supplies. I contend that such a



Invoice No.	809
Goods Recd.	3/16/20 By C.S.
Price O. K.	Jones, P.A.
Extens. Checked	B.
Distribution:	
Stores	\$ 465.00
Construction	36.00
Approved	Jas Smith Supt.
Paid by Ck. No.	

Stamp for backing Invoice  
Main Office segregation.

Fig. 8.

Invoice No.	809
Goods Recd.	3/16/20 By C.S.
Price O. K.	Jones, P.A.
Extens. Checked	B.
Distribution:	
Stores	465.00
Construction	
J.M. Foundations	30.00
Electric Lines	6.00
Approved	Jas Smith Supt.
Paid by Ck. No.	

Same with Local office  
segregation.

REPORT

detailed account is not required by the main office. Under the central account "Stores" the cashier will have posted all invoices returned to him for payment and a simple statement of the value of materials issued from Stores during the month properly segregated is sufficient to permit him to make up his Balance and Cost sheets for the month. Such a form, however, is valuable for a semi-annual or quarterly inventory, at the end of which periods a careful checking of the stock should be had.

The statement suggested should take the form shown in Figure 10 and Internal Transfers should be sharply contrasted with invoices from outside firms. It will be noted that while there is a debit and credit in this latter transaction, no cash is involved and consequently there is a distinction between the two. Interdepartmental transfers marked by some distinctive method such as "Transfer Memorandum" or "Journal Voucher" will save endless confusion when making up later reports.

One account to be observed on the distribution is "Accounts Receivable". It will be found <sup>an</sup> advantage ~~to~~ to "credit" all outside "sales" from stock under this head and debit the account when the bills are sent out, leaving it to the main office to balance the profits or losses. This is assuming that the bank account is controlled by that office. Where the conditions are such that the mine has a local bank account and pays the supply as well as labor bills it is handled in the ordinary business way.

A number of companies in charging out supplies from Stores, add a percentage or profit sufficient to cover the cost of handling. Once a basis for estimating this cost is established, it becomes a convenient means for disposing of endless loss and adjustment of accounts and overcomes an infinite amount of detail in distributing the minor expenses. It also gives a more equitable distribution of these costs.



Under this system the Storekeeper's salary, hauling and delivery expense are charged against the control account "Stores", no further distribution of these items being made. When the paper percentage is determined it is added to the "Ledger Value" of every article immediately when posted on the Record Cards, thus being included in the Unit cost and ready for charging out. The commoner method is to carry a "Storehouse Expense" account which takes up all of these minor charges and distributes them again later when making up the cost sheet. This latter account would be a sub-account under Operations.

Development	2087.00		
Ops	2716.00		
Material	393.00	1,200.00	
Operations	2850.00		
Equipment	197.00		
Construction	700.00		
Control	170.00	3,500.00	23,000.00
		<hr/>	
			26,500.00

Fig. 10. Example of proposed Monthly Statement

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STORES STATEMENT  
FOR MONTH OF APRIL 1919.

Balance stock on hand April 1, 1919	\$ 46,292.00	
Received during month (Invoices)	<u>16,160.00</u>	\$ 62,452.00

DELIVERIES DURING MONTH.

Cash sales	\$ 500.00	
Accounts Receivable	980.00	1,480.00

INTERNAL TRANSFERS FROM STOREHOUSE TO

MINE

Development	2087.00	
Ore	1718.00	
General	395.00	4,200.00

MILL

Operation	3650.00	
Equipment	197.00	
Construction	782.00	
General	359.00	<u>9,988.00</u>
		15,668.00

Balance on hand May 1, 1919.		\$ 46,784.00
------------------------------	--	--------------

Fig. 10. Example of proposed Monthly Storehouse Statement

REVENUE ACCOUNTING

The most critical subject connected with cost accounting, is the "segregation of costs". This important detail of the bookkeeper's work is one that can be mastered only with experience and studied application of the principles gained upon each job. The diversity of applications existing in business and the uncertainty as to the various classifications and the point of limitation for the detail thereunder, requires that the accountant be approached with caution. The amount of detail, however, is a matter to be determined in each particular case, and in the progress, arbitrary assumptions are herein made for the purpose of a general outline.

The accountant not familiar with the local distributions usually finds ready cooperation in the superintendent of a small plant in being more vitally interested in the costs than anyone else, will generally see that charges are properly made.

COST DISTRIBUTION.

When making up a cost sheet, which is the final effort in the cost accountant's work, there are a few cardinal points to keep in mind.

The main or "control" accounts must represent one of three classes of value,

- I. CAPITAL ACCOUNTS
  - (a) That which until converted has the full market value, and may be considered a liquid asset.
    - Stocks
    - Bonds
    - Real Estate, etc.
    - Bill receivable
  - (b) That having a partial or second hand value.
    - Buildings
    - Equipment
    - Inventory, etc.
- II. OPERATING ACCOUNTS
 

That which is converted immediately into cash or other

## SEGREGATING COSTS.

The most critical subject connected with Cost accounting, is the "Segregation of Costs". This important detail of the bookkeeper's work is one that can be mastered only with experience and studied application of the knowledge gained upon each job. The diversity of opinions existing among executives and accountants as to the various classifications and the point of limitation for the detail thereunder, makes it a subject to be broached with caution. The amount of detail, however, is a question to be determined in each particular case, and to make progress, arbitrary assumptions are herein made for the purpose of a general outline.

The accountant not familiar with the local distributions usually finds ready co-operation in the superintendent of a small mine; he being more vitally interested in the costs than anyone else, will generally see that charges are properly made.

When making up a cost sheet, which is the final effort in the cost accountants' work, there are a few cardinal points to keep in mind.

The main or "control" accounts must represent one of three classes of value.

### 1. CAPITAL ACCOUNTS

(a) That which until consumed has its full market value, and may be considered a 100% asset.

Stores  
Bonds  
Real Estate etc  
Bill receivable

(b) That having a partial or second hand value.

Buildings  
Equipment  
Livestock, etc.

### 11. OPERATING ACCOUNTS.

That which is consumed immediately, and has no recover-

Operating supplies  
Power  
Labor, etc

111. SUSPENSE ACCOUNTS.

That which is expended for operation or improvement, with no prospects of recovery, but which cannot be charged out in one payment.

Insurance  
Taxes  
Large machinery renewals, or  
Repairs which have several  
months' life.

(This class of accounts might properly come under division No. 1 as a sub-account, but it is usually disposed of in the above manner.)

The accounts and sub-accounts under these three divisions are:

Division 1.

(a) Stores  
Bonds  
Bullion (in storage or transit)  
real estate  
Cash  
Accounts Receivable

(b) EQUIPMENT  
Mining property  
Headframes  
Buildings  
Office Furniture  
Machinery of all kinds  
Livestock

CONSTRUCTION

New construction of a permanent nature (i.e. that adds value to the plant)  
Excavations  
Grading & Filling  
Foundations for bldgs.  
" for machinery  
Erection of new equipment#  
Laying of new or additional pipe lines,  
electric lines, etc.

#Note the distinction between equipment and the erection of same. The equipment itself has a depreciating value, which ultimately reaches what is termed "Scrap value", but always retains some worth. The "construction" costs may include labor charges, material, such as cement, nails, reinforcing steel, paint, etc, whose collective value lies in the service it gives; therefore, it should be charged out with a view to having it entirely consumed in "Depreciation" before the mine is worked out.



11. OPERATING.

Overhead (Main Office Accounts)

- Officers' fees
- Main Office Expense
- Legal "
- Insurance (Fire)
- Taxes
- Amortization of capital
- Interest

(These accounts are inserted to complete the list, but would not be handled by the accountant at the mine.)

(Carry in Columns.)

Controls::Subs::Items:S: S: P: T: PT:

INDIRECT OPERATING ACCOUNTS (Mine Office Accts.)

General Expense

- Administrative
- General Office Expense
- Camp Maintenance
- Industrial Insurance
- Assaying & Surveying
- Bullion Tax
- Marketing of Product

DIRECT OPERATING ACCOUNTS.

Mine General (Items, not accounts)

- Timekeeper
- Superintendent & Foreman
- Miscellaneous
- Hauling

Stopping (Sub-accounts) Items.

- |           |                          |
|-----------|--------------------------|
| Drilling  | Miners                   |
|           | Compressed air, etc      |
|           | Pipe Lines               |
| Breaking  | Caps                     |
|           | Powder                   |
|           | Fuse                     |
| Tramming  | Muckers                  |
|           | Car Repairs              |
|           | Track Laying & Repairs   |
| Hoisting  | Hoistmen                 |
|           | Fuel or Power            |
|           | Lubricants               |
|           | Cage & Hoist repairs     |
| Timbering | Timbermen                |
|           | Stulls, square sets, etc |
|           | Wedges                   |
|           | Framing                  |

Mine Development.

Drifting	(may be subdivided)	Drilling
Crosscutting	(into each working)	Breaking
Raising	(place, and take a)	Tramming
Sinking (Winzes)	(detailed division)	Hoisting
	(as those above. )	Timbering

Shaft Sinking.

Mill General. (Items, not accounts)

Timekeeper  
Superintendent & Foreman  
Office Supplies  
Miscellaneous  
Hauling

Mill Operation.

Crushing & Conveying	Filtering
Stamping	Clarifying
Classifying	Precipitating
Tube Milling	Refining
Concentrating	Bullion Expense
Neutralizing	Tailings Disposal
Settling	Superintendence
Agitating	Miscellaneous

Accounts Receivable.

List names of individuals or firms.

These accounts are finally divided into the classifications Labor, Supplies, and Power, totaled and carried out to the cost per ton bases.

With this list, it will be possible to take up in detail the distribution of charges contained on a standard invoice. (Fig. 11)

The first three items on the bill are obviously for use in operation, but as they will be drawn when used, and may be in stock for some time, they are charged into "Stores". No sub-accounts exist under this control except those carried on the record cards; the information for the latter is taken in detail from the face of the invoice, therefore, it is not required on the back.

Construction is a control which is subdivided; in this

case both accounts falling to the mine account. It will be observed that either article debited to these sub-accounts will have no future value, and therefore could not be charged to equipment.

Mill Tools is an account which is sometimes carried under Operation. It is believed that this is not the proper procedure. Tools newly purchased to increase the stock on hand are Equipment. However, the fact must not be overlooked that some of these will wear out or be lost as time passes, and when replacements are ordered, they are properly chargeable to Operation, in the department in which they are used. It is recommended that all such articles should be charged through the Storehouse, to be distributed when put into commission.

PACIFIC HARDWARE CO. INC.

RENO, NEVADA.

Order to University Mining Co.

APRIL 1, 1925.

10/2/25

10	6	Dr. Hooks, blades	4.30
	5	new Mill files 12"	1.25
	10	Only 3" C.I. flanges,	1.00
	10	lbs. Pipe cement	1.00
3000	100	lbs. 3/8" twisted steel rebar	1.00
	1	stayer speed indicator	1.00

Fig. 11. Cotton illustration showing the  
Top surface side with 20...

Invoice No. 860  
 Goods Recd. 4/10/19 By C  
 Price O. K. Jones P.A.  
 Extens. Checked B  
 Distribution: \$ 57.00  
 Stones  
 Construction  
 Pipes 3.00  
 Compressed Air 160.00  
 Equipment = Tools 2.00  
 Approved J. Smith Supt.  
 Paid by Ck. No. 42-10

PACIFIC HARDWARE COMPANY.  
 Reno Nevada.

Your Order - M-42  
 Our Order 134650  
 Req. No. 256

Sold To University Mining Co. April 1, 1919.

Terms 60/2/10

Mar. 30	4	Gr. hacksaw blades	\$ 37.00
"	6	Doz. Mill files 12"	14.40
	10	Only 3" C.I. Flanges.	5.60
	10	Lbs. Pipe cement	3.00
	2000	Lbs. 3/8" twisted steel reinforcing rods	160.00
	1	Starret speed indicator	<u>2.00</u>
			222.00

Fig. 11. Bottom illustrates invoice as received.  
 Top Reverse side with segregation.

A C C O U N T   B O O K S .

INVOICE NO.	FIRM	AMOUNT IN INVOICE.	STORES.	ACCOUNTS RECEIVABLE	EQUIPMENT	MILL	MINE CONSTRUCTION	MILL. CONSTRUCTION	GENERAL	MINE ORE	DEVL'PMT.	GENERAL.	MILL. OPERATION REPAIRS.
860	Pacific Steamers	222.00	57.00										
861	James Foundry	872.00			872.00	2.00	163.00						
862	J. W. Brown Co	94.00							37.00			37.00	

DIV I

DIV II

DIV III

Fig. 12. Invoice Register. Indentations at lower edge were made to show these accounts under their respective divisions.

ACCOUNT BOOKS.

The invoice charges having been properly distributed and "backed", it remains for the superintendent to approve it and send it to the M. O.

An excellent method of keeping the accounts checked closely, is to have a form (Fig. 12) known as an Invoice Register made up to accompany each batch of invoices sent to the main office. It has columns for the control accounts only as will be seen. A duplicate of this is kept on file at the local office. This form is not absolutely essential, but will aid in the discovery of losses of invoices between the two offices, and save future time in checking. Where a large number of invoices are handled, it is advisable to adopt it.

MINE LEDGER.

The usual procedure is to accumulate a number of bills before posting them to the "Mine Ledger", thus systematizing the work, and avoiding unnecessary handling of books and bills.

The method of backing the invoice adopted in this case, is that being installed by expert accountants in many large manufacturing establishments. A rubber stamp with the proper heads and blanks is used to make the impression, the operation requiring little time or effort. The items are filled in by pen and ink, or stamped. When posted they are filed without folding in a box file or drawer, where they may be indexed in accordance with the system adopted.

The popular method at small mines for collecting the costs represented on the invoices, is known as the "Voucher System". The idea is a modification of the well established Journal used in commerce. This book is the detailed record of every transaction.

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The "backing" on the voucher which is the receipted invoice serves the same purpose as the Journal; it gives the name of vendor, total amount of bill, and segregation of the account.

The permanent book of record for this system, is the "Voucher Record". This latter is a multi-column combination Ledger, Journal, and cost sheet, in which the month's accounts may be collected and totaled under their various heads, (Fig. 13). This simple system is in use very generally throughout the country.

This record, however, does not conclude the work of the local bookkeeper, for he has yet to make up the cost sheet for the <sup>month's bill</sup> M.O. and on the latter it is customary to divide the costs under the three heads - Labor, Supplies and Power.

It will be observed that to complete the work then the accountant must again refer to his vouchers to get the latter information. To overcome the inconvenience of this double handling of vouchers, and at the same time, to have a more detailed record, it has been deemed advisable, in a number of instances, to return to the old single entry ledger, but using a specially designed wider page.

Attention is called to the omission of detail from the Voucher Record. As an example of its inadequacy, suppose a certain machine or repair were purchased from a Machinery Company, and that numerous transactions were concluded with this company during the year. It is obvious that a new bookkeeper coming in a year later would have great difficulty in determining the cost of that machine, were he called upon to find it. Only the memory of someone who knew when and where it was purchased, or an accident, would save him from endless search through all of the vouchers of that firm over a long period.



# Voucher Record.

Month of April, 1919.

Voucher No.	In Account With.	Total Voucher		Stores	Acco Receiv
		Dr.	Cr.		
1060	Brown - C. R.	4350			
a-60	B. & R. Ry. Co.		6200		
a-61	Jones Foundry		3000		
1061	Pacific Hardware Co.	5000			
860*	" " "	22200		5700	
936	Reno Mercantile "	95640		5700	
		127190	9200	11400	
Total External Transactions		127190	9200	11400	
Internal Transfers From:					
Tr. W. 19	Stores			43200	
20	Mill Equipment				
21	Mine "				
Total Internal Transactions				43200	
Net Total for Month				31800	

\*. Voucher illustrated in Fig. 11.

Fig. 13 Voucher Record showing a portion of the accounts. This book is usually ruled and printed from special designs. Two Methods of posting are illustrated. " Total Voucher " has two columns. In some cases it is desirable to have all accounts so posted; in which event the same colored ink is used for both Debits and Credits and the red indicates the Balances only. For Mine cost keeping the numerous accounts preclude doubling the space required for this method. Therefore it is customary to carry the Debits in Black and the Cred in Red in one column for each account.

Voucher Record  
Construction

Surface & Plant.		Mine.		Repairs.	
Life Lines	Ele. Lines	Compressor	Headframe	Push & Convey	Tube Milling
5000					
300		16000		10000	10000
5300		16000		10000	10000
				1000	2000
				1000	2000
5300		16000		11000	12000

Month of April,

Voucher Record  
General Equipment

Voucher No.	In Account With.	Surface & Plant.		Mine	
		Buildings	Machinery	Tools	Machinery
1060	Brown - C. R.	4350			
1060	B. & R. Ry. Co.				
1061	Jones Foundry				
1061	Pacific Hardware Co.				
860*	" " "				
936	Reno Mercantile "				
Total External Transactions		4350			
Internal Transfers From:					
Tr. W. 19	Stores	3500		3500	
20	Mill Equipment				75
21	Mine "				30
Total Internal Transactions		3500		3500	45
Net Total for Month		7850		3500	45

\*. Voucher illustrated in

Fig. 13 Voucher Record is usually ruled and posting are illustrated in some cases it is desirable in some event the same colored ink is used the red indicates the various accounts precluded. Therefore it is customary to use red in one column for

Voucher Record  
General Equipment

Tools.	Mill Machinery	Electrical Lines	Machinery	Repairs.	Tusk & Convey	Tube Milling
--------	----------------	------------------	-----------	----------	---------------	--------------

200	5600			10000	10000	
-----	------	--	--	-------	-------	--

200	5600			10000	10000	
-----	------	--	--	-------	-------	--

	7500	10000		1000	2000	
--	------	-------	--	------	------	--

	7500	10000		1000	2000	
--	------	-------	--	------	------	--

200	1900	10000		11000	12000	
-----	------	-------	--	-------	-------	--

Month of April,

Mine Operation - Ore.

Voucher No.	In Account With.	Stope #3		Stope #3	
		Breaking	Tramming	Hoisting	Timber
1060	Brown - C. R.				
1060	B. & R. Ry. Co.				
1061	Jones Foundry				
1061	Pacific Hardware Co.				
860*	" " "				
936	Reno Mercantile "		2000	8000	
Total External Transactions			2000	8000	
Internal Transfers From:					
Tr. W. 19	Stores	7500	1000	1500	2000
20	Mill Equipment				
21	Mine "				
Total Internal Transactions		7500	1000	1500	2000
Net Total for Month		7500	3000	9500	2000

\*. Voucher illustrated in

Fig. 13 Voucher Record is usually ruled and posting are illustrate some cases it is desirable event the same colored the red indicates the errors accounts preclude Therefore it is custom in Red in one column f

Voucher Record  
Milling

General

operation

Repairs.

Automobile Liability Insur

Crush & Convey Tube Milling

Crush & Convey Tube Milling

10000

14000

26000

10000

10000

10000

14000

26000

10000

10000

2650

2000

1000

2000

2650

2000

1000

2000

10000

16650

28000

11000

12000

Fig. 14 is a suggested form for the mine or mill ledger and a method for its posting. It is not assumed that this is entirely novel; on the contrary, it is a composite of numerous forms and ideas offered by others on this subject.

The points of advantage claimed for it are: (1) The final cost sheet takes a similar form, it being a summary or recapitulation of the Ledger entries; for convenience then we have a form, wherein each invoice is posted under its various heads, and the determination of its classification made at once; i.e. it is entered at that time as Labor, Supplies, or Power. One handling thereby disposes of the invoice, and leaves the accounts ready to be totaled in the form they will be used on the final cost sheet.

(2) The name of vendor and item may both be posted without crowding, thus showing at once where a particular item was purchased, and its price at the time, without further reference to the vouchers.

(3) If the charges against one account far exceed all others, it may be forwarded to another page without totaling, and forwarding all of the remaining columns.

(4) An ordinary 3 column Journal may be utilized for this record without involving the expense of the high priced, specially ruled and printed "Voucher Record".

If it is desired to make a distinction between Operation and Repairs in a book of this kind, it would be well to allot two pages to each account; one side to be Operation, the other Repairs. Credit entries would then be made in red ink, debit in black. In the event the two are charged together, one page may represent Debits, the other Credits. (The old single entry system.)

### Equipment - Mill Tools.

No.	Date	Items	Supplies	Power	Labor
641	Mar 19	1- 36" Chain Tongs	8 00		
643	" "	1- Lodge + Shipley Lathe # 1462	2600 00		
643-F	" "	Freight " " "	240 00		
672	" "	1- Best Drill - 17"	4 00		
			<u>2852 00</u>		

### Mill Operation - Tube Mills

No.	Date	Items	Supplies	Power	Labor
601	Mar 19	Payroll - 1st 1/2 mo			462 00
613	" "	14- A-Liners	140 00		
620	" "	3- 1" " Bolts	45		
651	" "	Payroll - 2nd 1/2 mo			439 00
683	" "	Power Bill. Distrib. 1 mo		340 00	
682	" "	Rebblers - 12,000 lbs. mo.	150 00		
			<u>290 45</u>	<u>340 00</u>	<u>901 00</u>

Fig. 14. Two pages from Mill Ledger. The ledger divisions may be carried under the three main heads, or as Mine Ledger & Mill Ledger. Invoices are here numbered. They may be referred to by the firm name or initials if desired.



INTERNAL TRANSACTIONS.

The reader will have received some idea of disposing of transactions between departments from the illustration in the preceding discussion.

Although transfers aside from Stores, are infrequent, it occasionally becomes necessary to make changes whereby material charged to one department is removed to another. The "Transfer Voucher" is brought into use in such cases where the voucher system is used. The inside of the form is the ordinary invoice. One department bills the other for the items specified. The outside is backed as in Fig. (11).

Where the other system is followed, a "Transfer Memo" is in loose leaf sheet form, and all such transactions are noted upon it. The original is sent to the M. O. The copy is retained and filed, usually in a loose leaf Binder, the same as the "Voucher Register".

Fig. (15)

Fig. 15. Transfer Memorandum (Form). This form takes the place of the transaction voucher or journal voucher where a cost accounting. It is made in duplicate, supplied a copy for each office.

*Items not covered by ordinary accounting, but which are transferred from the one office to the other.*

TRANSFER MEMORANDUM

NO. 47

Date April 30, 1919.

	ACCOUNTS.	MINE ACCOUNTS		MAIN OFFICE.	
		SUBSIDIARY	CONTROL.		
DEBITS	40-1	Equipment - Headframe	30 00		
	2	Hoist No. 1.	26 50	56 50	
	3	Mill General	120 00	120 00	
	4	Mine "	120 00	120 00	
	5	Mill - Operation - Tule Mills	43 20		
	6	Classifiers	18 80		
	7	Pumps.	21 00	83 00	
CREDITS	40-1	Stores Lumber	30		
	2	" Hardware	26 50	56 50	
	3	General Expense - Insurance			120 00
	4	" "			120 00
	5	Stores Machine parts	43 20		
	6	" " "	18 80		
	7	" Packing.	21 00	83 00	

Fig. 15. Transfer Memorandum Sheet. This form takes the place of the Transaction Voucher or Journal Voucher common to cost accounting. It is made in duplicate, supplying a copy for each office.

REMARKS. Items 3 & 4 would not ordinarily occur on the same sheet with the other transfers, but would be transferred from the Main Office.

APPROVED

J. D. B.

ENT'D MINE

5/10/19

ENT'D MAIN OFF.

5/30/19

REPORTS.

Included in the diverse duties of the mine accountant is the receipt, interpretation and compiling of reports.

The competency of a mine bookkeeper is perhaps better demonstrated by his ability to handle such information than by correctly post and balance his books. He performs the function of the detective service of the police department, or the intelligence service of the army, in his relation to the management. In so far as he can correlate the information contained in the various daily or monthly reports with his cost records, and present them to the Superintendent, to that extent will the latter be able to take advantage of the collected data, and adopt corrective measures when necessary.

**REPORTS AND STATEMENTS.** The daily plant or mine reports falls upon the mine bookkeeper along with the timekeeping and Stores accounting and should be taken up with these topics to follow in the progressive order of his work; but to avoid confusion of subjects, it has been necessary to leave this discussion until we could consider all reports under one head.

As in the case of the time and stores records, the detail emanates from the working men. The shift bosses utilize this detail for their reports. These latter make up the information for the Foreman's statement, and the data becomes more collective and concentrated as it is summarized in the various reports up the line to the Superintendent and Manager.

The accountant is the custodian of all of these data (daily and all) and in many cases checks them over for possible errors. A comprehensive idea of the use of reports and their course through the organization is best demonstrated in a flow chart

## REPORTS.

Included in the divers duties of the mine accountant is the receipt, interpretation and compiling of reports.

The competency of a mine bookkeeper is perhaps better demonstrated by his ability to handle such information than to correctly post and balance his books. He performs the function of the detective service of the police department, or the intelligence service of the army, in his relation to the management. In so far as he can correlate the information contained in the various daily or monthly reports with his cost records, and present them to the Superintendent, to that extent will the latter be able to take advantage of the collected data, and adopt corrective measures when necessary.

Much of the routine of handling and filing the daily plant or mine reports falls upon the new bookkeeper along with the timekeeping and Stores accounting and should be taken up with those topics to follow in the progressive order of his work; but to avoid confusion of subjects, it has been necessary to leave this discussion until we could consider all reports under one head.

As in the case of the time and stores records, the detail emanates from the working men. The shift bosses utilize this detail for their reports. These latter make up the information for the Foreman's statement, and the data becomes more collective and concentrated as it is summarized in the various reports up the line to the Superintendent and Manager.

The accountant is the custodian of all of these data (detail and all) and in many cases, checks them over for possible errors.

A comprehensive idea of the use of reports and their course through the organization is best demonstrated in a flow sheet

such as Fig. .16.

The individual report forms follow:

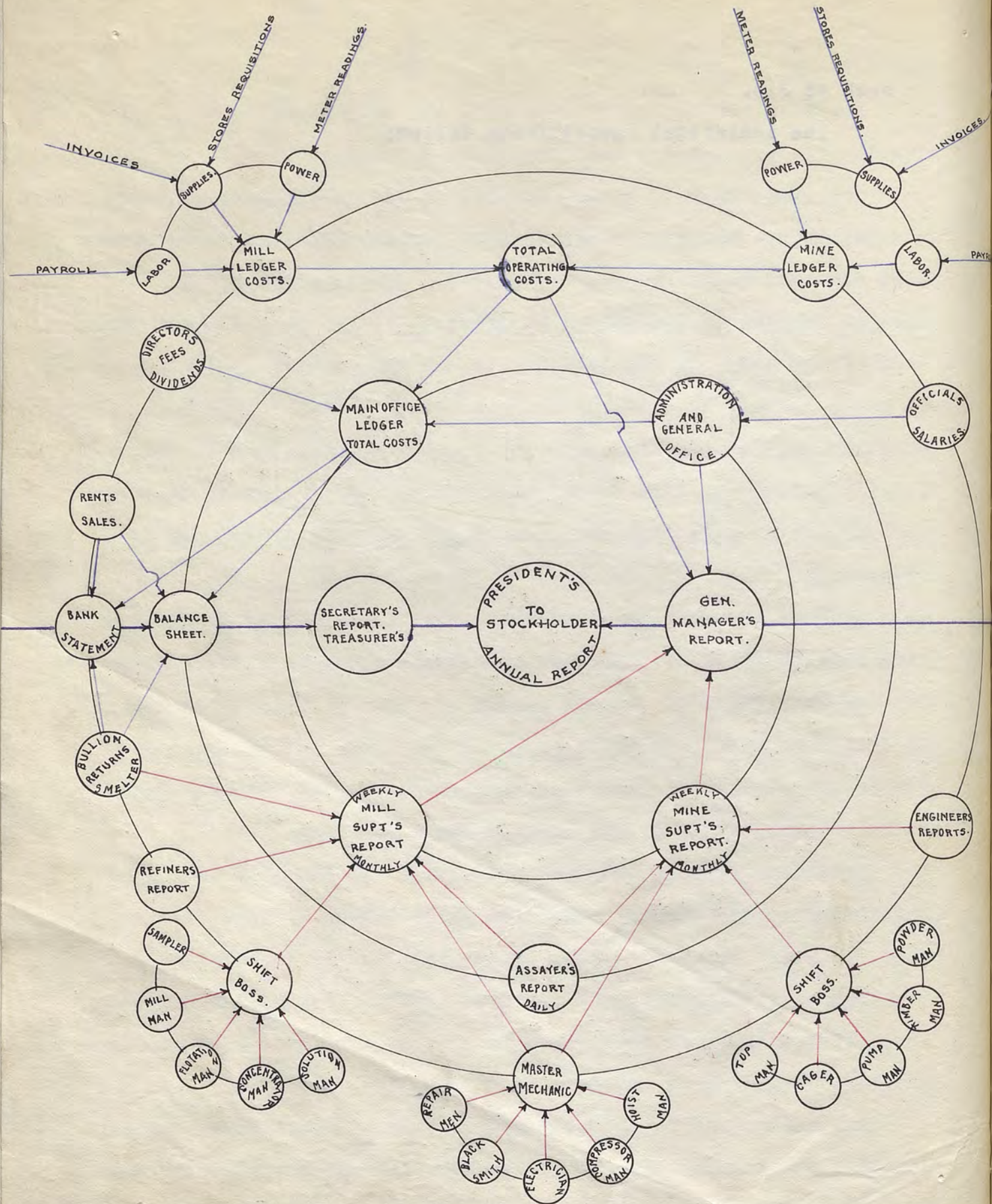


Fig.16. Flow sheet of Reports and Statements . For description see opposite page.

The flow sheet (Fig.16) is a graphic illustration of the course of reports and statements in their progress to the company stockholder.

A similarity is suggested to the solar system in which the President's report occupies the position of the sun. All information gravitates to this central point. The reports occupy smaller orbits as their importance increases. The red connecting lines are Reports of Progress and work, the blue lines Statements and Cost records. Upon reaching the General Managers or Secretary's reports they are merged into the purple lines to the President's Annual Report.

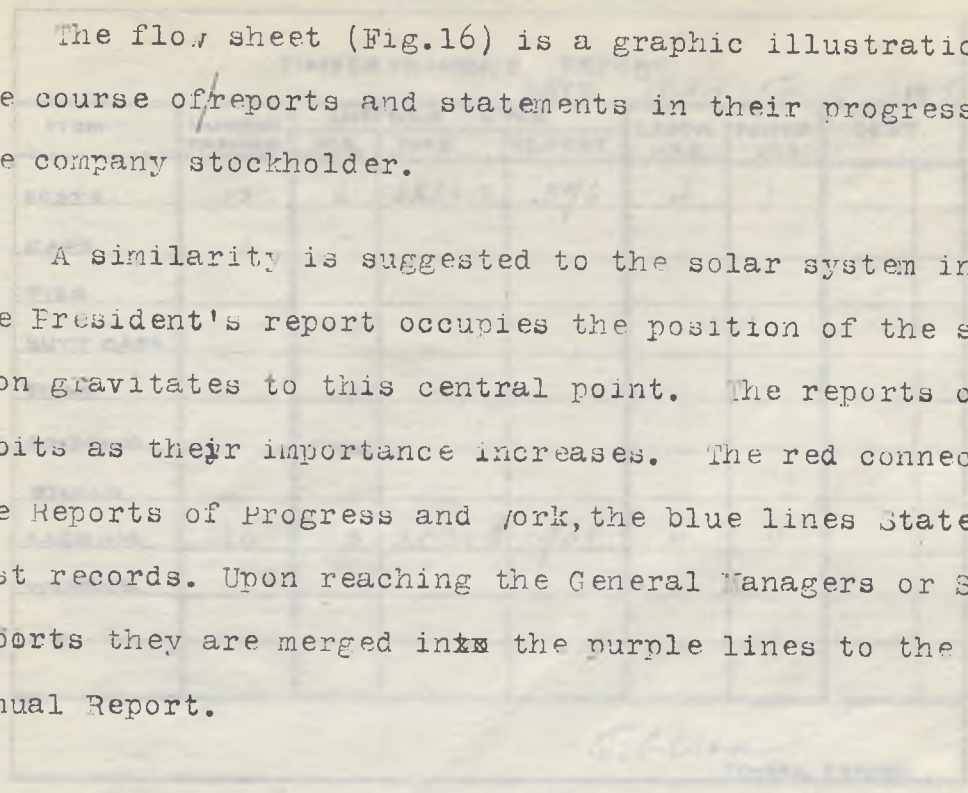


Fig. 17. Illustration of the report.

This report is to be made a part of the annual report, after recording the work done in the department for the year. It is to be made by the department head and should be made up of a summary of the work done, a list of the accomplishments, and a list of the deficiencies. It will be sent to the President and the Board of Directors. It will also be sent to the stockholders. It will be made up of a summary of the work done, a list of the accomplishments, and a list of the deficiencies. It will be sent to the President and the Board of Directors. It will also be sent to the stockholders.

A check card should be carried for each item and should have the number of the report filed in it.

TIMBER FRAMER'S REPORT.								
DATE <i>Mar 15</i> 1919								
ITEM	NUMBER FRAMED	LUMBER USED			LABOR HRS.	POWER HRS.	COST.	
		PGS.	SIZE	BD. FEET				
POSTS.	<i>12</i>	<i>6</i>	<i>8X8X18</i>	<i>596</i>	<i>4</i>	<i>1</i>		
CAPS.	<i>6</i>	-	"	-				
TIES								
BUTT CAPS.								
SILLS								
CRIPPING.								
STULLS.								
LAGGING.	<i>160</i>	<i>53</i>	<i>2X12X18</i>	<i>1908</i>	<i>4</i>	<i>4</i>		
WEDGES.								
<i>C. Olson</i> TIMBER FRAMER								

Fig. 17. Timber Framer's Report.

This report is in reality a part of the Stores records. While recording the work done it also serves to account for the lumber and timber stock. The finished pieces remain in Stores until used by the mine timbermen. It will be well to keep these reports of a size corresponding to the time cards and progress reports, file daily and post to the stock cards periodically.

A stock card should be carried for each item and credit made to "Lumber" for the amounts used in framing.



TIMBERMAN'S REPORT.			
SHIFT <u>7-3</u>		DATE <u>Apr. 10, 1919</u>	
HRS.	PLACE AND NATURE OF WORK.	MATERIAL USED	
		PCS.	KIND
6	100- N. Raise- 1 sett	2	End Plates
		2	Wall.
		4	Posts
		40	Wedges
2	200- Big Staps- 2 Stalls	2	4'-14"
		16	Wedges.
8			
		<i>W. Bennett.</i> TIMBERMAN.	

Fig. 18. Timberman's Report.

The Timberman's Report is self explanatory. It should be simple, made up daily and serve both as Time and Material card to assure a proper report on the latter. When the Book keeper has checked off the time it should go with the Stores requisitions for reference when balancing stock.

The forms are specially designed and are standard and are well utilized.

The shift boss checks up and verifies the Timberman's Report before it goes to the bookkeeper.

HOISTING REPORT.						
SHAFT NO. <i>Stary</i>						
SHIFT <i>7-3</i>			DATE <i>Apr. 3, 1920</i>			
LEVEL NO.	CARS ORE	CARS MILL DIRT.	CARS WASTE	WATER	WASTE TO FILLS.	
100	20	40	6			
TUNNEL	3		16			
200	40					
300		10	18			
420		30				
500	10		20			
710	73	40	24			
TOTAL.	73	120	84			
<i>R. E. S.</i>			<i>A. Johnson</i>			
SHIFT BOSS			TOPMAN.			

Fig. 19. Topman's Report.

The Cager's Reports at the small mine usually consist of a series of Tally-boards which are pegged as the ore and waste are hoisted. The totals are reported to the Topman who generally makes the report for the day. Where more elaborate systems exist the forms are specially designed and no standard can be well applied.

The Shift boss checks up and approves the Topman's Report before it goes to the Bookkeeper.

EXPLOSIVES RECORD.

MONTH OF February 1970

WORKING 200 Level North Crosscut #2

DAY	1 1/2" Powder Sticks	2" Powder Sticks	Fuse Feet	Water Fuse Feet	Caps.	Cap Protectors	Drawn By	Drawn For	Remarks.
1	44		32		8		Hepper A.P.H.		3 sticks returned by Haggerty.
2									
3									
30									
31									
Total									
<u>Owen Richards</u> POWDERMAN.									

Fig. 20. Powderman's Record and Report.

During the war and since, the strict regulations imposed upon handling explosives demand that an accurate account of these items be kept and responsible men placed in charge of the issues. Some properties had already installed systems for special accounting of such material and such a form is shown in Fig. 20 revised to meet the Government requirements. Except in the smaller properties where a Powderman would be unnecessary, there is no reason why such a record should be discarded after the restrictions are removed. Heretofore most companies had a loose method of checking out these supplies because of the necessity for storing them in unexposed places. One means of maintaining such a system is to designate one of the employees as powder-man during that part of the shift when withdrawals are made.



SHIFT BOSSES' REPORT.

Under the system described wherein individual reports of work and time expended thereon are made by the workmen, there is not so much need of a daily report from the Shift Boss. It is well to have it so, for with his time book to keep correctly posted, his stope and face samples to take, and the multiplicity of details which he has to attend, his time is well occupied. He should receive and check all daily reports from the mine and when he has attested to their correctness, these with the daily time-book, constitute his report.

As a matter of good management, however, and to retain his interest, he should receive a weekly summary of the work accomplished in his department; this, with intelligent advice from the Superintendent occasionally will go a long way toward keeping up production records.

ASSAY REPORTS are made as simply as possible to cover the mineral values contained in the ores. Usually, a system of numbers are adopted for identifying samples, and this system is adhered to, so that all parties concerned may know from what location they came. The Mine Superintendent receives the report on all mine samples and the Mill Heads, the mill Superintendent mill samples only. The Manager also receives copies of each.

A book of Repairs and Renewals is generally kept in the office in which the Master Mechanic makes report as necessary, otherwise, he makes a daily report which is carried to cost cards on individual pieces of equipment.

The Engineer reports ore reserves, Progress in Development, and ore extracted as called upon to do so. His data are kept ordinarily on mine maps, stope sheets, etc. in graphic form. The

reports submitted by him are checks against the daily reports coming through the shift bosses.

This information all coming into the Superintendent's office is now concentrated into a general report and submitted weekly or monthly to the General Manager. It may be well to suggest to the new Superintendent that complete detail reported at short intervals will serve to make less frequent the visits of the manager and thereby give him greater freedom of action in performing his own work. A specimen follows. ~~Fig. 23.~~

These have been utilized for illustrating because of their availability. Many of them could be materially improved for a general form, but they will at least offer some suggestions which the reader may find worth considering.

MILL REPORTS.

As in the case of the mine, the Mill has its detailed reports which likewise are checked by the shift boss or in some smaller plants he receives verbal reports from the various departments and includes the information in one report.

Several forms follow which were used extensively by the Goldfield Consolidated Mines Co at Goldfield, Nevada. These have been utilized for illustrating because of their availability. Many of them could be materially improved for a general form, but they will at least offer some suggestions which the reader may find worth considering.

DATE	TONS--WET	% H <sub>2</sub> O	TONS--DRY	Average Daily Tonnage Received	CAR DISTRIBUTION OF ORE RECEIVED							REMARKS	
					Mohawk	Combination	Clermont	Laguna	Assay				Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

TOTAL

Stock on Hand

Fig. 23. office record of ore milled.

Total to Account for Milled this Month

65

Stock on Hand



### MILLING DEPARTMENT

BATTERY	HOURS RUN	SHIFT ENDING ..... M. ...., 19..	
		CAUSE OF DELAY	REPAIR PARTS USED
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
Total Hours			
Tube Mill			Chilian Mill
1			
2			
3			
4			
5			
6			
Total Hours			

Fig. 24. Battery and millman's daily report.

# DAILY FLOTATION REPORT

Goldfield Consolidated Milling and Transportation Co.

ORE

Goldfield, Nevada

Date	Metals	ASSAYS							Total Recovery	CELLS			Moisture Ratio	Screen Analysis	Tons Treated	Oils Used Kind & Lbs. per Ton	Other Chemicals
		Heads	FLOTATION			TABLE				Rougher	Series or Parallel	Cleaners					
			Concentrates	Tails	% Recovery	Concentrate	Tails	% Recovery									
	Au. ozs.																
	Ag. ozs.																
	Cu. %																
	Insol. %																

REMARKS

448. 25. flotation report.

SIGNED .....

07

The Goldfield Consolidated Mines Company  
FILTER RECORD

SHIFT ENDING \_\_\_\_\_ M. DATE \_\_\_\_\_ 191 \_\_\_\_\_

Charge	No.	Minutes Filling	Minutes Making Cake	Minutes Returning	Minutes Washing	Minutes Discharging	TOTAL

REMARKS:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Operator \_\_\_\_\_

fig. 26. Filter record used in connection with Lutter's filter. At many plants a filter log book is kept and this information remains with the oncoming shift to serve as a guide to their work. The summary only is retained for the office report.

## CONSOLIDATED MILL DAILY REPORT

FOR 24 HOUR DAY

DATE

191

HOURS

BATTERY HOURS

TUBE MILL HOURS

LBS.

PEBBLES USED

KCN USED

LIME USED

ZINC DUST USED

LEAD ACETATE USED

	TONS	KCN	P. A.
STRONG SOL. PPT.			
WEAK SOL. PPT.			
SLIMES FILTERED			

Fig. 27. Supply report. This differs from the form on the opposite page in that the latter is a production report. Here the Shift boss system is in vogue the two reports should be combined with others here illustrated.

GOLDFIELD CONSOLIDATED MINES COMPANY  
DAILY MILL REPORT

	TONS	ASSAY	HEADS	TAILS	PRODUCTION
% Time Run					
Shifts					
Ore Received					
Ore Milled					
Mill Residues					
Mill Solutions					

Fig. 28. Daily Production report. See remarks under Fig. 27

Fig. 29. Refinery...  
a refinery...  
molten...  
refined...  
refining.

# GOLDFIELD CONSOLIDATED MILLING & TRANSPORTATION CO.

REFINERY RECORDS

DATE,

191

	SHIFT 12 TO 8	SHIFT 8 TO 4	SHIFT 4 TO 12	TOTAL 24 HOURS
Lbs. Dry Precipitate Received				
Lbs. Dry Precipitate Fluxed				
Lbs. Dry Concentrate Added for Flux				
Lbs. Litharge Added for Flux				
Lbs. Ashes Added for Flux				
Lbs. Flue Dust Added for Flux.				
Lbs.           Added for Flux.				
Lbs.           Added for Flux.				
<u>    Total Lbs. Dry Briquettes</u>				
Lbs. Dry Briquettes fed to Blast No. 1				
Blast No. 2				
Lbs. Base Bullion from    Blast No. 1				
Blast No. 2				
Lbs. Base Bullion fed to Cupel No. 1				
Cupel No. 2				
Ozs. Refined Bullion from Cupel No. 1				
Cupel No. 2				
<u>    Steele-Harvey</u>				

Signed, .....  
                    Watchman, 12 to 8

Signed, .....  
                    Watchman, 8 to 4

Signed, .....  
                    Watchman, 4 to 12

Signed, .....  
  Refinery Foreman.

Fig. 29. Refineryman's Report. This covers the work of a refinery practice closely following that in use in lead smelters, in fact is a small scale lead smelting plant. A remodeled form would be applied to a different system of refining.









The final reports of the Mine and Mill superintendents should be comprehensive and yet in such concise form that the General Manager does not have to spend his time in studying unnecessary detail. These reports, it must be realized are the summaries of those that have gone before including the costs of carrying out the work reported. Fig. 33 and 34 show the ideal form of monthly statement from the Mine superintendent while the forms illustrated by Figs. 35 and 36 cover completely the information required of a Milling and Cyanide plant.

The reader will have become familiar enough with the forms by this time to understand the monthly and yearly reports without detailed explanation. For the benefit of those who wish to follow the subject farther, a complete Annual Report to Stockholders formerly published by the Goldfield Consolidated Mining Company is appended. This is the final official report for the year and is the general form adopted by most mining companies. I submit it in its entirety as an excellent model and in the belief that it cannot be materially improved upon.

MINE REPORT FOR MONTH OF

WORKING.	THIS MONTH.			TO DATE.			
	Tons Produced	Value	Value Per Ton.	Feet Advanced.	Tons. Produced	Value.	Feet Advance
STOPES.							
No.1. West	1150	9200.00	8.00		6300	69,300.0	
No.3. East	250	1750.00	7.00		16250	138,125.0	
No.4. East	1600	16000.00	10.00		2800.	28,000.0	
DRIFTS.							
132				62.5			
134				18.0			
602				38.0			
608				103.0			
CROSSCUT.							
601				60.0			
603				82.0			
RAISES.							
N-6	30	540.00	18.00	30.0	30	540.0	30
S-2	40	320.00	8.00	45.0	90	720.84	100
WINZES							
300-4				18.4			46
TOTALS.	3070	27010.00					

INDIVIDUAL ITEMS CONSTITUTING MINING EXPENSE.

ITEM.	THIS MONTH.			TO DATE.		
	Quantity	Value.	Per Ton	Quantity	Value.	Per Ton.
Powder						
Fuse						
Caps						
Carbide						
Candles.						
Shaft Setts.						
Drift Setts						
Stope Setts.						
Lagging.						
Stulls						
Wedges.						

Fig. 32. Progress & Production Report.

MINE STATEMENT FOR MONTH OF

76

TOPING.	OPERATING EXPENSES THIS MONTH.				MONTHS TO DATE	
	Labor.	Supplies.	Power.	Total.	Per Ton.	Total.
Breaking						
Timbering						
Tramming						
Hoisting						
Winding.						
Surface.						
Total.						
DEVELOPMENT.					Per Ft.	
DRIFTS.						
132						
134						
602						
608						
ROSCUTS.						
601						
603						
RAISES.						
North 6						
South 2						
WINZES.						
300-4						
Diamond Drill						
Total.					Per Ton.	
GENERAL.						
Surveying						
Assaying						
Mechanical						
Electrical						
Sampling						
Superintendence.						
Automobile						
Miscellaneous.						
Total.						
TOTAL MINING						

Fig. 33. Mine Statement.

# Goldfield Consolidated Milling & Transportation Co.

## MONTHLY MILL REPORT

### INDIVIDUAL ITEMS CONSTITUTING MILLING EXPENSE

ITEM	THIS MONTH		MONTHS TO DATE	
	QUANTITY PER TON ORE MILLED	COST PER TON ORE MILLED	QUANTITY PER TON ORE MILLED	COST PER TON ORE MILLED
Cyanide, 100%				
Zinc Dust				
Lime				
Lead Acetate				
Muriatic Acid				
Water				
Belting				
Lubrication				
Borax				
Litharge				
Pig Lead				
Shoes and Dies				
Pebbles, Flint				
Pebbles, Rock				
Tube Mill Linings				
Chilian Mill Steel				
Machinery and Repairs				
Screens				
Office Supplies				
Filter Cloth				
Iron and Steel				
Assaying				
Hose and Fittings				
Pipe and Fittings				
Lumber				
Crusher Parts				
Mortar Linings				
Coal				
Coke				
Slag				
Pump Parts				
Waste				
Electrical Operation and Repair				
General Stores				
Fuel Oil				
Iron Ore				
<b>TOTAL SUPPLIES</b>				
Operating Labor				
Repair Labor				
Power				
<b>TOTALS</b>				

Fig. 35. This report should be the standard 11" length.

MILL OPERATING REPORT FOR MONTH OF

ORES MILLED

	WET TONS	PER CENT H <sub>2</sub> O	DRY TONS	OZS. AU. PER TON	TOTAL OZS. AU.	TOTAL VALUE AU
On Hand						
Re'ed. This Month						
Total						
Milled This Month						
On Hand						
Milled to Date						
Cyanide Plant Heads						
Ditto to Date						
Mill Tails this Mo.						
Mill Tails to Date						

MILL AVERAGES, ETC.	THIS MONTH	TO DATE	
Battery Hours Run			
Battery Hours Lost			
Per Cent. Time Run			
Per Cent. Time Lost			
@ Power			
@ Water			
@ Shoes—Dies			
@ Screens			
@ Stems			
@ Chilian Mills			
@ Tube Mills			
@ Cyanide Plant			
@ Battery Tank			
@ Miscellaneous			
Total			
Stamp Duty per 24 Hours (Running Time)			
Per Cent. Recovery by			
Concentration			
Cyanidation			
Total			
Per Cent. Recovery from Concentrates—Raw			
Per Cent. Recovery from Concentrates—Roasted			
Lbs. K.C.N. per ton ore milled			
Lbs. Lime per ton ore milled			
Lbs. "Special" per ton ore milled			
Lbs. Zinc Dust per ton ore milled			
Lbs. Lead Acetate per ton ore milled			
Lbs. Steel—Shoes and Dies per ton			
Lbs. Tube Mill Pebbles per ton			
Lbs. Chilian Mill Steel per ton			

Accountant

Mill Superintendent

Fig. 36 a. Mill Report. for Month. This report can be combined with Fig. 35 or 36 or both to make a complete summary for the month.

MILL STATEMENT FOR MONTH OF

DEPARTMENTS	OPERATING EXPENSES THIS MONTH					MONTHS TO DATE	
	LABOR	SUPPLIES	POWER	TOTAL	PER TON ORE MILLED	TOTAL	PER TON ORE MILLED
Conveying							
Separating							
Milling							
Grinding							
Flotation							
Smelting							
Refining							
Chemical							
Service							
and Plant							
Heat							
Light							
House and Office							
Contingencies							
Attendance							
Expense							
Tools							
Medical Department							
Electrical Department							
Water							
Total							
Generation							
Repairs							

PRODUCTION

	BARS TONS	ASSAYS		OUNCES		ACTUAL VALUE	
		GOLD	SILVER	GOLD	SILVER	GOLD	SILVER
Bullion							
Shipped							
Dumped							
Losses							
This Month							
Bullion to Date							
Shipped to Date							
Dumped to Date							
Losses to Date							
Production to Date							

Fig.36. A Monthly Mill Statement. This is a combined Cost and Production sheet.





STANDARDIZATION.

Before concluding, it will be well in connection with the foregoing, to state that greater headway can be made and less confusion result in all accounting systems; if an early attempt is made to standardize the account books and report forms, both as to size and methods of filing.

In this no set rule can be laid down, every business having, to a greater or less degree, its own peculiar problems; but the accountant who is far sighted will readily see the advantage of formulating a plan for recording his information, so that it can be followed out indefinitely. In so doing, he will save his company endless expense in later years in efforts to simplify their methods.

One of the STANDARDIZATIONS, lies in the adoption of as few sizes as possible. If all records can be kept to two or three standard sized forms, there will be found much greater flexibility in the entire system of handling and disposing of them.

As an example of this, numerous manufacturing concerns have adopted the Lefax notebook for their plant records. The various department heads are supplied with a loose leaf book of the same size, and as their notes are recorded, they may be passed on to the foreman, plant superintendent, or to another department for exchange of views or information. Proper files are provided in the office for preserving all data of which a permanent record is required. This may be referred to or sent out again to the plant at any future date without imposing labor on the office force.

The system mentioned provides a convenient size for pocket note book, and the originators of the plan carry the idea further by publishing their technical literature on the same sized sheets,

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One of the first considerations in this line is the adoption of as few sizes as possible. If all records can be kept to two or three standard sized forms, there will be found much greater flexibility in the entire system of handling and disposing of them.

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The system mentioned provides a convenient size for pocket note book, and the originators of the plan carry the idea farther by publishing their technical literature on the same sized sheets,

so that any information of value to the plant organization may be issued to the <sup>men</sup> mine, thus keeping up a continuous campaign of interesting instruction in their work. The double or triple sized sheets are made to fold to the proper size for the books, and general orders, or special instructions from the central offices may be printed or typewritten on these larger sizes ready for insertion in the books for later reference.

The next size of which almost universal use can be made, is the ordinary Business Letter size 8½ x 11". This for the purpose of making out reports either printed or typed, for statements of accounts, or for almost any other purpose, is hard to improve upon. It is of proper dimensions for attaching to correspondence. It is the same width as the standard invoice and may be punched and inserted in a loose leaf book, bound with letters or bills which apply to the same subject, or filed loose in any box, drawer, or portable container, always presenting a neat and compact manuscript that cannot be obtained with odd sizes.

Where possible all cost data should be kept on one <sup>or</sup> of the other of these sizes. If the Lefax is not suitable, a size should be adopted that will come nearest to filling all requirements and all additional records thereafter made to conform to it.

In the question of books requiring special ruling, this same principle should be followed as nearly as possible. These must again be adapted to the particular case, but for the sake of uniformity, a standard length or depth should be established.

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The foregoing may also be advantageously applied to drawings, sketches, or maps. By adopting a certain unit size for a minimum drawing, the larger tracings can be made twice, three or four times that size, so that the blue prints will fold into a uniform and compact package.

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