

A SYSTEM OF ANALYZING WORKMEN'S COMPENSATION BUSINESS BY MEANS OF PERFORATED CARDS.

BY

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The work usually hitherto undertaken by the statistical department of a casualty company writing compensation business may be divided into two general headings:

- (1) An analysis of business for annual statement requirements, which includes the classification of premiums written and losses paid
 - by states for computing taxes,
 - by agencies,
 - by policy years for computation of loss reserves, and also a continuous classification of premiums on policies in force by months of expiration for calculation of unearned premiums; and
- (2) An analysis by states of premiums written and payroll exposure and of losses, by trade classifications, compiled upon what is known as a policy-year basis.

With the change that has taken place in the nature of the business of casualty companies from employers' liability to workmen's compensation, it has now come to be realized that in addition to the compilation by states of a financial experience by trade classifications, an accident investigation should also be made. For the calculation of a scale of pure premiums for compensation insurance based upon the combined experience of states having compensation laws, it is necessary to know the accident rate by trade classifications with an analysis of the gravity of accidents and their resulting periods of disability. The Workmen's Compensation Service Bureau has promulgated a plan for combining the experience of companies writing compensation business who are members of the Bureau, from which it will be possible to deduce not only the pure premiums by trade classifications under the benefits provided by any particular state law, but also the accident frequency in different trades, analyzed by causes and results.

No attempt is made in this paper to outline in what form accident statistics should be compiled, or to deal with the difficult problem of the best method of treating outstanding claims in preparing a financial experience. The object of this paper is simply to outline the plan that the Aetna Life Insurance Company has adopted for classifying business for annual statement requirements, for analyzing premiums written, payroll exposure, and losses paid by trade classifications, and for collecting the data required by the Workmen's Compensation Service Bureau for an accident investigation.

The system of perforated cards is peculiarly adapted for compiling the statistics required by a casualty company. The Hollerith system of punched cards was adopted by the company with which I am associated for compiling its statistics over five years ago. The Hollerith sorting and tabulating machines are so well known amongst the statisticians of casualty companies that no explanation of them will be required. For any one who is not fully familiar with their working, reference can be made to a full description of the machines contained in a paper by Mr. Arthur Hunter on "Mortality Investigations by Perforated Cards" in Volume 11 of the Transactions of the Actuarial Society of America.

DESCRIPTION AND PREPARATION OF CARDS FOR ANALYSIS OF PREMIUMS WRITTEN FOR ANNUAL STATEMENT REQUIREMENTS.

It might be thought at first that one set of cards could be prepared for the whole of the premium analysis required, and this is the system adopted by some companies. It is my opinion, however, that work will be facilitated without increasing cost by preparing two sets of cards, one for the analysis of premiums written by states, agencies, policy years, and for computation of unearned premiums, etc., and the other set of cards for compiling financial experience by trade classifications. The actual number of cards to be punched will not be greatly increased in following this plan because it must be remembered that since every application contains on the average premiums for three or four different trade classifications, requiring the preparation of three or four experience cards, one for each trade classification, it will be necessary to prepare only one card for use in analyzing premiums for annual statement work unless the application is written for business carried on in more than one state.

ETNA LIFE INS. CO. ACCT. AND LIAB. DEPT.
Register Card.

| 0 0 | 0 | H. O. No. | No. of Policies | E | LT | Premium | Agent | State | Policy Year | Return Premium | 12 ENTERED | | Date MO. DAY YR. | Date of POL. | Date of EXP. | Ledger | |
|--------|---|-----------|-----------------|----|----|---------|-------|-------|-------------|----------------|------------|-------------|------------------|--------------|--------------|--------|--|
| | | | | | | | | | | | 11 | Mo. Day Yr. | | | | | |
| Lts. | 5 | 10 | 7½ | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 100 | 200 | | | | |
| | | | Expiry Mo. Yr. | P | ST | V | XX | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | |

“Register” Card for Recording Original Premiums upon Applications.—On the opposite page is illustrated this card for analysis of original premiums for annual statement requirements. The printed headings of the columns upon the card are all self-explanatory with the following exceptions: the symbol “R” in the first column is punched to designate the card as being prepared from an application. In the second field the letters “Lts” stand for the limits of the policy. The symbols in the sixth field stand for the general class of business, as this card is used for analyzing Liability as well as Compensation premiums: “E” stands for Employers; “P,” public; “V,” teams; “AV,” automobile; “GL,” general liability; “H,” elevator; “WC,” workmen’s collective; “C,” compensation; and “D,” physicians’ liability. In the next field “LT” and “ST” stand for “Long Term” and “Short Term,” in other words three-year and one-year policies; if a company writes business for other periods, a separate column would have to be provided for “Term of Policy.” In the field headed “Entered,” the date upon which the business is recorded is gang-punched each day. The reason for inserting the field headed “Return Premium” is explained later.

Cards are prepared in duplicate by clerks working independently, and upon one set the spaces on the left hand are filled in with pen and ink. This set is then filed away in numerical order. It is unnecessary to keep a book register of business written, as this set of cards will very conveniently replace such a record. The space marked “Ledger” in the corner of the card is used in checking typewritten cards, which are prepared from the applications for the accounts department for premium collection purposes. The duplicate punched cards are used for tabulation.

If the punched cards constitute the sole record of business written kept by a company, as is the case with the Aetna Life Insurance Company, it is essential that a proper check should be made of them.

CHECKING OF CARDS.

It is hardly necessary to state that there are two methods of checking perforated cards. The first is to punch a card and read it back with the copy from which it was prepared, and the second method is to have two cards punched by different operators and to compare them by placing them together and holding them up to the light, noting that the perforations on the cards are identical.

Additional and Refund Premium Card.
ETNA LIFE INS. CO. ACCIDENT AND LIAB. DEPT.
 Additional and Refund Premiums

| JOURNAL Page | H. O. No. | No. of Policies | 12 Expiry | | E | LT | ST | Premium | Y Y Agent | State | Policy Year | Return Premium | Premium Cancelled | Premium Reinstated | 12 Entered | |
|--------------|-------------|-----------------|-----------|----|----|----|----|---------|-----------|-------|-------------|----------------|-------------------|--------------------|------------|----|
| | | | Yr. Mo. | 11 | | | | | | | | | | | Yr. Mo. | 11 |
| 0 0 | 0 0 0 0 0 0 | 0 | 0 | 0 | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R 1 1 | 1 1 1 1 1 1 | 1 | 1 | 1 | AV | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| LT 2 2 | 2 2 2 2 2 2 | 2 | 2 | 2 | GL | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| A 3 3 | 3 3 3 3 3 3 | 3 | 3 | 3 | H | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| B 4 4 | 4 4 4 4 4 4 | 4 | 4 | 4 | WC | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| C 5 5 | 5 5 5 5 5 5 | 5 | 5 | 5 | C | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| D 6 6 | 6 6 6 6 6 6 | 6 | 6 | 6 | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| E 7 7 | 7 7 7 7 7 7 | 7 | 7 | 7 | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 8 8 | 8 8 8 8 8 8 | 8 | 8 | 8 | D | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 99 9 9 | 9 9 9 9 9 9 | 9 | 9 | 9 | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |

The first method is usually adopted on the grounds that it is more economical. My own experience has been in the contrary direction. It is difficult to obtain a proper degree of accuracy without punching the cards in duplicate. Moreover, the punching of cards in duplicate by independent clerks takes very little longer than punching one set and "calling it back," and further, the duplicate set can usually be made to serve some other useful purpose. Furthermore, in such a case as that in which the punched card is the sole record of the amount of premiums written that a company keeps, accuracy is essential and by punching two sets of cards an additional check can be made of the amount of premiums written by running through the tabulator both sets of cards and noting that the premiums on each set are identical. Such a check as nearly eliminates errors in compiling the amount of business written as is possible.

Additional and Refund Premiums.—Record of these premiums can be made either upon vouchers or sheets. Upon these vouchers or sheets should be entered, in addition to the amount of the premium, the agent, state, policy year, term of policy, date of expiration, trade classification, payroll, and in the case of cancellations the amount of the original premium cancelled.

The illustration on the opposite page is of a card used for analyzing additional and refund premiums. The second and third columns on the card are provided for punching, for reference purposes, the number of the sheet from which the card is prepared. It will be noticed in this illustration that the card is exactly similar to the "Register" card from the third to the twenty-ninth columns, inclusive. This arrangement of columns is made so that the "Register" and "Additional and Refund Premium" cards may be sorted and tabulated together. The headings upon the card are all self-explanatory with the exception of the letters in the first column. In this column "LT" stands for renewals on policies written for a term of years by annual premiums, "A" for fully earned additional, "B" for miscellaneous additional, "C" for refunds on audits, "D" for refunds on cancelled policies, and "E" for refunds on not-taken policies. In the last field upon the card headed "Entered" is gang-punched the month and the year in which the business is recorded.

The provision on the card for two columns, one for "Premium" and another for "Return Premium," instead of providing only

ÆTNA LIFE INSURANCE COMPANY
ACCIDENT AND LIABILITY DEPARTMENT

State *Illinois*

Agent

| 1915 | Premiums Written | Misc. Additionals | Additional Earned Premiums | Misc. Refund Premiums | Refund Premiums | Not Taken | Net Premiums |
|-------|------------------|-------------------|----------------------------|-----------------------|-----------------|-----------|--------------|
| Jan. | \$10986.96 | \$3935.34 | \$1056.71 | \$2440.74 | \$180.80 | \$2347.55 | \$11009.92 |
| Feb. | 16637.31 | 2347.85 | 2204.03 | 1260.44 | 95.50 | 2858.01 | 16975.24 |
| Mar. | 13156.13 | 1822.55 | 3568.64 | 1535.38 | 230.25 | 2729.10 | 27985.16 |
| Apr. | | | | | | | 14052.59 |
| May | | | | | | | 42037.75 |
| June | | | | | | | |
| July | | | | | | | |
| Aug. | | | | | | | |
| Sept. | | | | | | | |
| Oct. | | | | | | | |
| Nov. | | | | | | | |
| Dec. | | | | | | | |

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one column, and denoting by punching a symbol as to whether the amount recorded thereon is a premium or a return premium, greatly facilitates the tabulation of results. A card punched "A," for example, with an amount in the "Return Premium" column designates a credit to additional earned premiums. A card punched "E" with an amount recorded in the "Premium" column designates a credit to not-taken premiums, in other words a reinstatement; and in this case the same amount would be punched in the "Premium Reinstated" column. In the case of a policy cancelled during its term, the authorized refund will be punched in the "Return Premium" column and the full premium cancelled in the "Premium Cancelled" column. In the case of a not-taken policy, the amount of the full premium will be punched both in the "Return Premium" and in the "Premium Cancelled" columns.

There are great advantages in tabulating gained by designing cards in this way. On classifications where all that is required is an analysis of net premiums written, all cards for original, additional, refund, and not-taken premiums may be sorted together according to the classification required. They will then be run through a tabulator furnished with two adding counters, the plugs on one counter being set for the "Premium" column and upon the other counter for the "Return Premium" column. Before transcribing the figures appearing upon the counters, the amount on the counter corresponding to the refund premiums is deducted mentally or otherwise from the amount appearing on the counter corresponding to the premium column, and the net result transcribed.

MONTHLY TABULATION OF CARDS.

It is my experience in compiling results that the best method for efficiency and accuracy is to compile the necessary classifications of business each month, transcribing the monthly totals directly from the tabulating machine counters to summary cards. An illustration is given on page 96 of a summary card for the analysis of premiums by states. If all the classifications that have to be made are drawn off every month, the cards can be packed away and stored, a plan that will effect considerable saving of space. If tabulation is made of six months' or a year's business at a time, much space is required for filing cards, considerable difficulties encountered in balancing results, and delay involved in compiling them.

If the course is adopted of tabulating at the beginning of each month all classifications of premiums recorded in the previous month that will eventually be required, it is very desirable to have a card so designed that corrections in the state, policy year, agency, expiration, etc., can be readily made. The device of having a column upon both the "Register" and "Additional and Refund Premium" cards for "Return Premium" as well as "Premium" facilitates changes in classifications that may be required on cards already tabulated. If, for example, it is required to change the state upon a premium for which a card has already been punched and tabulated, an adjustment in the tabulation of the premiums in the month in which the error is discovered can be readily made by punching a credit card for the data as originally recorded, and a new debit card with the correct data. For example, if it were discovered in February that the premium on an application charged in January had been assigned to New York, whereas the correct state was New Jersey, all that would be necessary to correct the error would be an adjustment in the tabulation of business recorded in February. This would be done by punching a "Register" card with the state as New York and the amount of premium punched in the "Return Premium" column, and a new card with the amount of premium punched in the "Premium" column for the state of New Jersey. The inclusion of these cards in tabulation with the cards for business recorded in February will automatically adjust the error.

COMPUTING UNEARNED PREMIUMS.

In tabulating the cards for classification of business arranged for computing unearned premiums, it is evident that cards punched "A" and "C," which are punched for additional and refunds charged after audits upon expirations of policies, need not be used. All that is necessary, therefore, is to tabulate together by months of expiration the difference between the amounts in the columns "Premium" and "Return Premium" upon cards punched "R," "LT," and "B" in the way just described to obtain the new business written to be added to the business in force, and to tabulate by months of expiration the difference between the amounts punched in the fields headed "Premiums Cancelled" and "Premiums Reinstated" upon the cards punched "D" and "E" to obtain the business cancelled, to be deducted from the business previously in

AETNA LIFE INSURANCE COMPANY

[Form 2341]

ACCIDENT AND LIABILITY DEPARTMENT

Class *Compensation*

| | Expiration | | Business in Force February 28, 1915 | | Business Written Month of March, 1915 | | Business Terminated Less Reinstatements Month of March, 1915 | | Business in Force March 31st, 1915 | | |
|-------|------------------------------|-------|--|-----------|--|-----------|--|----------|---------------------------------------|-------------|--------------|
| | Year | Month | No. | Premiums | No. | Premiums | No. | Premiums | No. | Premiums | |
| | Policies Run- ning 1 Year | 1915 | Mch. | 1563 | \$126597.02 | | | 1563 | \$126597.02 | | |
| April | | | 1518 | 140894.88 | 17 | \$1278.95 | 32 | 1836.69 | 1503 | \$140337.14 | |
| May | | | 1369 | 127540.38 | 17 | 529.64 | 43 | 5820.39 | 1343 | 122249.63 | |
| June | | | 9567 | 660336.14 | 28 | 2387.72 | 292 | 19642.65 | 9303 | 643081.21 | |
| July | | | 3359 | 176298.71 | 17 | 3098.23 | 134 | 8308.93 | 3242 | 171088.01 | |
| Aug. | | | 1492 | 91916.88 | 9 | 919.07 | 53 | 2128.57 | 1448 | 90707.38 | |
| Sept. | | | 1436 | 95395.21 | 19 | 1138.87 | 43 | 2312.74 | 1412 | 94221.34 | |
| Oct. | | | 2082 | 155574.43 | 7 | 4242.74 | 39 | 7283.29 | 2050 | 152533.88 | |
| Nov. | | | 1251 | 98171.18 | 13 | 4000.55 | 32 | 2629.42 | 1232 | 99542.31 | |
| Dec. | | | 1246 | 126679.38 | 29 | 8327.69 | 46 | 4107.65 | 1229 | 130899.42 | |
| 1916 | | | Jan. | 4144 | 336467.92 | 161 | 25133.05 | 416 | 46237.88 | 3889 | 315363.09 |
| | | | Feb. | 1567 | 128841.65 | 461 | 40681.28 | 195 | 25315.44 | 1833 | 144207.49 |
| | | Mch. | | | 2064 | 144120.40 | 67 | 11828.12 | 1997 | 132292.28 | |
| | | | | 30594 | \$2264713.78 | 2842 | \$235858.19 | 2955 | \$264048.79 | 30481 | \$2236523.18 |
| | | | | | | | | | | Unearned | \$1022385.53 |

ANALYZING WORKMEN'S COMPENSATION BUSINESS.

force. A sample of the sheet upon which the business written and cancelled, analyzed by months of expiration, is recorded is illustrated on page 99.

In passing it may be useful to describe a simple but convenient device for computing the actual unearned premiums, i. e., the actual unearned premiums on the assumption that policies are effected on the average in the middle of the month in which they are issued. A movable slip is prepared, as illustrated below, with lines at the same distance apart as those on the unearned premium reserve sheet, with the fractions $\frac{1}{24}$, $\frac{3}{24}$, $\frac{5}{24}$. . . $\frac{23}{24}$ entered one below the other, expressed in decimals.

| VALUATION FACTORS. | |
|----------------------|---------------------|
| Premiums Expiring in | Fractions Unearned. |
| 0- 1 month | .041667 |
| 1- 2 months | .125000 |
| 2- 3 months | .208333 |
| 3- 4 months | .291667 |
| 4- 5 months | .375000 |
| 5- 6 months | .458333 |
| 6- 7 months | .541666 |
| 7- 8 months | .625000 |
| 8- 9 months | .708333 |
| 9-10 months | .791667 |
| 10-11 months | .875000 |
| 11-12 months | .958333 |

This slip is placed beside a table of premiums upon policies in force classified by months of expiration, and the amount of premiums for each month is successively multiplied by the corresponding factor upon the slip by means of any standard calculating machine, the product after each multiplication has been made not being effaced from the machine. After the last multiplication has been made, the total on the face of the machine will be the computed amount of unearned premiums. Similar slips can be prepared for policies whose terms are 2, 3, 4, 5 years, etc.

ANALYSIS OF PREMIUM AND PAYROLL BY TRADE CLASSIFICATIONS.

A copy of the card used for analysis of written premiums and corresponding payrolls upon which they are based for investigating financial experience by trade classifications is shown on page 101. It differs from the card recommended by the Bureau in

ETNA LIFE INSURANCE COMPANY
Compensation Payroll Card

| 11 | | 12 | | Date Pol. | Sch. | Class | Payroll | Premium | Rebate Payroll | Return Premium | Entered |
|--------------|-----------|-----------|---------|-----------|------|-------|---------|---------|----------------|----------------|---------|
| Journal Page | H. O. No. | Date Pol. | Yr. Mo. | | | | | | | | |
| 0 0 | 0 0 0 0 | 0 0 | 0 0 | 11 10 | 0 0 | 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 | 11 0 0 |
| R 1 | 1 1 1 1 | 1 1 | 1 1 | 1 1 | 1 1 | 1 1 | 1 1 1 1 | 1 1 1 1 | 1 1 1 1 | 1 1 1 1 | 1 1 1 1 |
| LT 2 | 2 2 2 2 | 2 2 | 2 2 | 2 2 | 2 2 | 2 2 | 2 2 2 2 | 2 2 2 2 | 2 2 2 2 | 2 2 2 2 | 2 2 2 2 |
| A 3 | 3 3 3 3 | 3 3 | 3 3 | 3 3 | 3 3 | 3 3 | 3 3 3 3 | 3 3 3 3 | 3 3 3 3 | 3 3 3 3 | 3 3 3 3 |
| B 4 | 4 4 4 4 | 4 4 | 4 4 | 4 4 | 4 4 | 4 4 | 4 4 4 4 | 4 4 4 4 | 4 4 4 4 | 4 4 4 4 | 4 4 4 4 |
| C 5 | 5 5 5 5 | 5 5 | 5 5 | 5 5 | 5 5 | 5 5 | 5 5 5 5 | 5 5 5 5 | 5 5 5 5 | 5 5 5 5 | 5 5 5 5 |
| D 6 | 6 6 6 6 | 6 6 | 6 6 | 6 6 | 6 6 | 6 6 | 6 6 6 6 | 6 6 6 6 | 6 6 6 6 | 6 6 6 6 | 6 6 6 6 |
| E 7 | 7 7 7 7 | 7 7 | 7 7 | 7 7 | 7 7 | 7 7 | 7 7 7 7 | 7 7 7 7 | 7 7 7 7 | 7 7 7 7 | 7 7 7 7 |
| 8 8 | 8 8 8 8 | 8 8 | 8 8 | 8 8 | 8 8 | 8 8 | 8 8 8 8 | 8 8 8 8 | 8 8 8 8 | 8 8 8 8 | 8 8 8 8 |
| 9 9 | 9 9 9 9 | 9 9 | 9 9 | 9 9 | 9 9 | 9 9 | 9 9 9 9 | 9 9 9 9 | 9 9 9 9 | 9 9 9 9 | 9 9 9 9 |

Card for Analysis of Business by Trade Classifications.

that a field is provided for the month in which insurance begins, to take care of the compilation of experience statistics brought up to intermediate dates of the year, as is sometimes required both by state departments and by the Bureau itself.

These cards are prepared directly from the applications and additional and refund premium sheets at the same time as the other cards already described, and the premiums are balanced on each set of cards. For tabulation, a four-counter tabulating machine will be required, as payroll, premium, rebate payroll, and return premium will be tabulated at the same time. It would not be feasible to analyze payroll and premium every month, because, owing to the large number of trade classifications, very few cards, when sorted, would fall in most of the groups to be tabulated. Analysis of these cards must be made at more extended intervals as may be found most convenient.

The Bureau has expressed to the companies a strong preference for having data furnished to it by perforated cards rather than by compiled results. No doubt there is good reason for this preference in reference to the furnishing of accident statistics, but as regards analysis of premiums written and payroll exposure by trade classifications, the question seems to me a different one. As regards accidents, the experience of individual companies will be too small to warrant, for each company, such a full analysis of its experience as may be made by the Bureau of the combined experience of all companies. As regards analysis of premiums written and payroll exposure by trade classifications, however, every company will have to undertake this for its own requirements, and it would seem a good course for the companies to send to the Bureau compiled results. Such results could be furnished on sheets or on perforated cards, one card for each policy year of the business (divided by states) for each trade classification. Such a course would save the Bureau much time by largely diminishing the number of cards to be handled.

ANALYSIS OF LOSSES.

An illustration is also given on page 103 of the card used for analysis of losses. The headings upon the card are all self-explanatory. The letter "L" in the eleventh column is punched to denote "Lump Sum Settlement." The code used for "Kind of Payment" is the code adopted by the Workmen's Compensation Service Bureau for a reason that is shown later.

ETNA LIFE INSURANCE COMPANY
Compensation Losses

| 12 Date of Pol. | 12 Date of Acc. | 12 L | Payment | Credit to Payment | Kind of Pay- ment | Policy Year | State | Y Agency X | Sch. | Class | 12 Entered |
|-----------------------|-----------------------|------------|------------|----------------------|-------------------------|----------------|------------|------------------|------------|------------|---------------|
| Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. | Yr. Mo. |
| 11 | 11 | | | | | | | | | | 11 |
| 0 10 | 0 20 | 0 10 | 0 0 0 | 0 0 0 | 0 0 | 1 1 | 0 0 | 0 0 0 | 0 0 | 0 0 0 | 0 0 |
| 1 1 | 1 11 | 1 1 | 1 1 1 | 1 1 1 | 1 1 | 1 1 | 1 1 | 1 1 1 | 1 1 | 1 1 1 | 1 1 |
| 2 2 | 2 22 | 2 2 | 2 2 2 | 2 2 2 | 2 2 | 2 2 | 2 2 | 2 2 2 | 2 2 | 2 2 2 | 2 2 |
| 3 3 | 3 33 | 3 3 | 3 3 3 | 3 3 3 | 3 3 | 3 3 | 3 3 | 3 3 3 | 3 3 | 3 3 3 | 3 3 |
| 4 4 | 4 44 | 4 4 | 4 4 4 | 4 4 4 | 4 4 | 4 4 | 4 4 | 4 4 4 | 4 4 | 4 4 4 | 4 4 |
| 5 5 | 5 55 | 5 5 | 5 5 5 | 5 5 5 | 5 5 | 5 5 | 5 5 | 5 5 5 | 5 5 | 5 5 5 | 5 5 |
| 6 6 | 6 66 | 6 6 | 6 6 6 | 6 6 6 | 6 6 | 6 6 | 6 6 | 6 6 6 | 6 6 | 6 6 6 | 6 6 |
| 7 7 | 7 77 | 7 7 | 7 7 7 | 7 7 7 | 7 7 | 7 7 | 7 7 | 7 7 7 | 7 7 | 7 7 7 | 7 7 |
| 8 8 | 8 88 | 8 8 | 8 8 8 | 8 8 8 | 8 8 | 8 8 | 8 8 | 8 8 8 | 8 8 | 8 8 8 | 8 8 |
| 9 9 | 9 99 | 9 9 | 9 9 9 | 9 9 9 | 9 9 | 9 9 | 9 9 | 9 9 9 | 9 9 | 9 9 9 | 9 9 |

Loss Card.

Changes in information regarding losses paid are frequently received. Any changes in the data concerning loss payments may readily be made by the use of the "Credit to Payment" column provided on the card, in precisely the same way in which it has been described that changes in the classification of premiums are made by use of a "Return Premium" column.

The loss cards are punched directly from loss vouchers, which are prepared in the claim department, and from them is drawn off each month an analysis of losses paid by states and agencies, and by policy years. Also at less frequent intervals, the necessary analysis of losses according to kinds of payment is made for compiling a financial experience by trade classifications.

The tabulated results of premiums written, payroll exposure, and losses paid are transferred to summary cards, an illustration of which is given on page 104.

ACCIDENT ANALYSIS.

In making an analysis of accidents by causes and results, the Aetna Life Insurance Company proposes to use the Hollerith cards designed by the Workmen's Compensation Service Bureau, samples of which for the sake of completeness are shown here on pages 106 and 107. There are two cards: one (the "Paid on Accident" card) is used for loss payments, and the other for recording cases upon which full settlement has not been made. The method adopted by the Bureau for making corrections in data concerning accidents already reported is to punch a "Credit" or "Contra" card in such a manner as to exactly duplicate the data recorded on the original card. The accident is then recorded as a new case with the correct data. The "Credit" or "Contra" cards are distinguished by their color. They will, of course, have to be tabulated and sorted separately, and the results deducted from the results obtained from the tabulation of the "Paid on Accident" cards. A complete description of these cards with sets of codes has been prepared by the Workmen's Compensation Service Bureau, and there will be stated here only the method for collecting data from which to punch them.

When an accident is reported, it is given a serial number, and as full particulars as are available are entered upon an "Accident Analysis" card, a copy of which is shown on page 108. The data is recorded by means of code numbers from the codes prepared by the Bureau. The duration of disability, when an acci-

WORKMEN'S COMPENSATION SERVICE BUREAU
Paid on Accident. (Color E.)

| YYY Designating No. XXX | State E | Classifica- tion | 22 Dec. Acct. Date | F Sex M | Age Yr. | Y | MEDICAL PAID | | Cause of Injury | E Nature of Injury | Wkly Wage | DURATION OF INJ. Weeks | Y | COMPENSATION PAID | | Counter |
|-------------------------------|------------|---------------------|--------------------------|---------------|------------|---|--------------|------------|--------------------|--------------------------|--------------|------------------------------|-------|-------------------|-------|---------|
| | | | | | | | Dollars X | Cents X | | | | | | Dollars | Cents | |
| 0 0 0 | 0 0 0 | 0 0 0 | 20 Oct. | I | 0 | 0 | 0 0 0 | 0 0 0 | X | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 1 |
| 1 1 1 | 1 1 1 | 1 1 1 | 11 Jan. | 1 | 1 | 1 | 1 1 1 | 1 1 1 | X | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 0 |
| 2 2 2 | 2 2 2 | 2 2 2 | 12 Feb. | 2 | 2 | 2 | 2 2 2 | 2 2 2 | X | 2 2 2 | 2 2 2 | 2 2 2 | 2 2 2 | 2 2 2 | 2 2 2 | 2 |
| 3 3 3 | 3 3 3 | 3 3 3 | 13 Mar. | 3 | 3 | 3 | 3 3 3 | 3 3 3 | X | 3 3 3 | 3 3 3 | 3 3 3 | 3 3 3 | 3 3 3 | 3 3 3 | 3 |
| 4 4 4 | 4 4 4 | 4 4 4 | 14 Apr. | 4 | 4 | 4 | 4 4 4 | 4 4 4 | X | 4 4 4 | 4 4 4 | 4 4 4 | 4 4 4 | 4 4 4 | 4 4 4 | 4 |
| 5 5 5 | 5 5 5 | 5 5 5 | 15 May | 5 | 5 | 5 | 5 5 5 | 5 5 5 | X | 5 5 5 | 5 5 5 | 5 5 5 | 5 5 5 | 5 5 5 | 5 5 5 | 5 |
| 6 6 6 | 6 6 6 | 6 6 6 | 16 Jun. | 6 | 6 | 6 | 6 6 6 | 6 6 6 | X | 6 6 6 | 6 6 6 | 6 6 6 | 6 6 6 | 6 6 6 | 6 6 6 | 6 |
| 7 7 7 | 7 7 7 | 7 7 7 | 17 July | 7 | 7 | 7 | 7 7 7 | 7 7 7 | X | 7 7 7 | 7 7 7 | 7 7 7 | 7 7 7 | 7 7 7 | 7 7 7 | 7 |
| 8 8 8 | 8 8 8 | 8 8 8 | 18 Aug. | 8 | 8 | 8 | 8 8 8 | 8 8 8 | X | 8 8 8 | 8 8 8 | 8 8 8 | 8 8 8 | 8 8 8 | 8 8 8 | 8 |
| 9 9 9 | 9 9 9 | 9 9 9 | 19 Sept. | 9 | 9 | 9 | 9 9 9 | 9 9 9 | X | 9 9 9 | 9 9 9 | 9 9 9 | 9 9 9 | 9 9 9 | 9 9 9 | 9 |

Workmen's Compensation Service Bureau's "Paid on Accident" Card.

WORKMEN'S COMPENSATION SERVICE BUREAU
Outstanding. (Color A.)

| YYY Designating No. | State | Last | Classifica- tion | 22 Dec. Acct. Date | F Sex M Imp % | Y Age X Grp. | Y Out- standing Dollars Only | Y Cause of Injury X | R Nature of Injury L | W'ly Wage | Est. Out- standing Duration Weeks Only | WEEKLY BENEFIT Dollars Cents | COMPUTED RESERVE Kind Dollars Only | Counter |
|------------------------|-------|------|---------------------|--------------------------|---------------------------|-----------------------|--|------------------------------|-------------------------------|--------------|--|---------------------------------------|--|---------|
| | | | | | | | | | | | | | | |
| 0 0 0 | 0 | 20 | 0 0 0 | 20 | | 0 | 0 0 0 | 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 | |
| 1 1 1 | 1 | 11 | 1 1 1 | 11 | 1 | 1 | 1 1 1 | 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 | |
| 2 2 2 | 2 | 12 | 2 2 2 | 12 | 2 | 2 | 2 2 2 | 2 | 2 2 2 | 2 2 2 | 2 2 2 | 2 2 2 | 2 | |
| 3 3 3 | 3 | 13 | 3 3 3 | 13 | 3 | 3 | 3 3 3 | 3 | 3 3 3 | 3 3 3 | 3 3 3 | 3 3 3 | 3 | |
| 4 4 4 | 4 | 14 | 4 4 4 | 14 | 4 | 4 | 4 4 4 | 4 | 4 4 4 | 4 4 4 | 4 4 4 | 4 4 4 | 4 | |
| 5 5 5 | 5 | 15 | 5 5 5 | 15 | 5 | 5 | 5 5 5 | 5 | 5 5 5 | 5 5 5 | 5 5 5 | 5 5 5 | 5 | |
| 6 6 6 | 6 | 16 | 6 6 6 | 16 | 6 | 6 | 6 6 6 | 6 | 6 6 6 | 6 6 6 | 6 6 6 | 6 6 6 | 6 | |
| 7 7 7 | 7 | 17 | 7 7 7 | 17 | 7 | 7 | 7 7 7 | 7 | 7 7 7 | 7 7 7 | 7 7 7 | 7 7 7 | 7 | |
| 8 8 8 | 8 | 18 | 8 8 8 | 18 | 8 | 8 | 8 8 8 | 8 | 8 8 8 | 8 8 8 | 8 8 8 | 8 8 8 | 8 | |
| 9 9 9 | 9 | 19 | 9 9 9 | 19 | 9 | 9 | 9 9 9 | 9 | 9 9 9 | 9 9 9 | 9 9 9 | 9 9 9 | 9 | |

Worker's Compensation Service Bureau's Outstanding Card.

COMPENSATION—Accident Analysis

| | | | | | | | | | | | | |
|--|--|---|-------------------------|--------------------------|-----|-------------------------|-----------|--|-----------|-----------------------|------|--------|
| Accident Number | | | Claim Number | | | State | | Policy Year | | MEDICAL PAYMENTS | | |
| AETNA LIFE | | Basic Manual Class No. | DATE OF ACCIDENT | | Sex | Degree of Impairment | Age Group | Mark X if fees not strictly medical | YEAR PAID | | | |
| Sched. No. | Class No. | | Year | Month | | | | | | | | |
| INJURY | | | | | | | | | | COMPENSATION PAYMENTS | | |
| MACHINE | | | CAUSE | NATURE | | WEEKLY WAGES | KIND | DURATION | | YEAR PAID | KIND | AMOUNT |
| Manner of Occurrence | Enter X if acc. at point opera- tion | Enter Y if acc. due to ma- chine const. | | Enter R if right side | | | | Days | Days | | | |
| | | | Enter L if left side | | | | | | | | | |
| REMARKS (If fatal case show dependents, etc.) | | | | | | | | | | | | |
| Accident Analysis Card | | | | | | | | | | | | |

dent results in disability, is entered when the final payment on the claim is made. Once a year, before the Bureau accident cards are punched from this record, a review is made of all the cards with the claim papers. After this has been done, medical fees paid and compensation paid for the previous year are recorded, the information being drawn from the perforated loss cards already described by sorting these into numerical order by accident numbers, and tabulating from them upon the "Accident Analysis" cards the amounts paid according to kinds of payment. The Bureau cards will be punched in duplicate with the view of sending one set to the Bureau, and retaining the other set for the company's own use.

It is hoped that the foregoing brief description of a method of compiling statistics may be of assistance to those who have not as yet introduced into their offices the system of perforated cards, and to others who have not completed their plans for best furnishing to the Workmen's Compensation Service Bureau the data it requires for a comprehensive accident investigation.