

4-1922

Commission Problems Simplified

John F. Mahoney

Follow this and additional works at: <https://egrove.olemiss.edu/jofa>



Part of the [Accounting Commons](#), and the [Taxation Commons](#)

Recommended Citation

Mahoney, John F. (1922) "Commission Problems Simplified," *Journal of Accountancy*. Vol. 33: Iss. 4, Article 4.

Available at: <https://egrove.olemiss.edu/jofa/vol33/iss4/4>

This Article is brought to you for free and open access by the Archival Digital Accounting Collection at eGrove. It has been accepted for inclusion in *Journal of Accountancy* by an authorized editor of eGrove. For more information, please contact egrove@olemiss.edu.

Commission Problems Simplified

By JOHN F. MAHONEY

There have appeared at various times, in the *Student's Department* and elsewhere in THE JOURNAL OF ACCOUNTANCY, suggested methods for the solution of problems involving the computation of commissions after deducting federal taxes. The difficult feature of this type of problem is that the commission is a deductible expense in computing taxes and, by the conditions of the commission agreement, taxes must be known before commission can be determined.

In some of the solutions which have come to the attention of the writer, algebraic formulæ, intricate and possibly mysterious to the average person, have been derived and employed in the process of solution. Without question, the algebraic method is a handy mathematical tool to have under control when required. Very few accountants, however, use algebra often enough in their daily work to feel confident of results obtained by that method, especially when the formulæ employed must be derived in the course of the computation.

In other solutions, especially those contained in the admirable and very complete article by Mr. Van Oss in the JOURNAL of January, 1921, preliminary amounts are first computed for taxes and commission. These preliminary amounts are known to be incorrect, and by a process of reasoning the percentage of error is determined and applied to find correct amounts of commission and taxes.

In many of the solutions encountered, the problems have been classified according to relation of commission to tax brackets. That is, the commission is stated to be contained wholly in the first or second bracket of the excess-profits tax, or partly in each bracket, or, in the case of individual proprietorship, all in one certain surtax bracket, or partly in two adjoining brackets.

Now, as between the government and the taxpayer, it is true that the tax in the final bracket of the excess-profits tax or the final surtax bracket is decreased by the existence of such a commission agreement. The agent entitled to the commission, however, is not concerned with tax brackets, since by the terms of his agreement every dollar of net profits after taxes contains a certain proportion which belongs to him as his commission. (Under conditions similar to those given in problem 2, of course, commission attaches only to every dollar over the amount of last

year's profits.) This is true of the portions exempt from taxes and the amounts included in any and all tax brackets.

It is on the above principle that the method of solution here suggested is based, namely, that every dollar of net profit has attached thereto a certain amount of commission, subject to exceptions imposed by the conditions of the problem, such as noted concerning problem 2.

Attention is called to the fact that algebraic formulæ are not required in the solutions; that only the details of procedure are varied by changing the conditions of the problem, and that the amounts representing commission and taxes, when determined, are final. Preliminary incorrect determinations are not required. Proof given with each problem demonstrates the accuracy of the method and the results obtained.

The following series of problems is intended to cover all the variations which may ordinarily be met with in the conditions contained in problems of this nature. They may be classified as follows:

- Problem 1. Sole proprietorship: commission paid to sales manager on total amount of net profits after taxes have been deducted.
- Problem 2. Sole proprietorship: commission paid only on the increase of this year's profits over last year.
- Problem 3. Corporation: commission at a flat rate paid on total net profit after taxes have been deducted.
- Problem 4. Corporation: commission paid on net profit after taxes, but on a sliding scale of commission.

PROBLEM 1

A sole proprietor agrees to pay his sales manager, as commission, 10% of net profits after federal taxes. Income before taxes and commission is \$23,462.04. Commission is to be considered an expense of the business in determination of net profits.

(1)	(2)	(3)	(4)	(5)
Progressive total accounted for in columns 2 + 3	Taxable income	Commission 2 — (4 + 5) 10% of	Normal tax	Surtax
\$ 2,200.00	\$ 2,000.00	\$ 200.00	Exempt	Exempt
4,383.00	4,000.00	383.00	\$ 160.00	\$ 10.00
\$ 6,583.00				
15,218.00	14,000.00	1,218.00	1,120.00	700.00*
21,801.00				
1,661.04	1,533.74	127.30	122.70	138.04
\$23,462.04	\$21,533.74	\$1,928.30	\$1,402.70	\$ 848.04

Commission Problems Simplified

PROOF OF PROBLEM 1

	Income	Tax
Total income	\$23,462.04	
Deduct commission	1,928.30	
	<hr/>	
Taxable income	\$21,533.74	
Less exemption	2,000.00	
	<hr/>	
Balance subject to tax	\$19,533.74	
Normal tax:		
4% on	4,000.00	\$ 160.00
	<hr/>	
8% on	\$15,533.74	1,242.70
	<hr/>	
Total normal tax		<u>\$ 1,402.70</u>
Surtax:		
Taxable income as above	\$21,533.74	
Surtax exemption	5,000.00	
	<hr/>	
1% on	\$16,533.74	\$ 10.00
	<hr/>	
*Average of 5% on	\$15,533.74	700.00
	<hr/>	
9% on	\$ 1,533.74	138.04
	<hr/>	
Total surtax		<u>\$ 848.04</u>
Total tax		<u>\$ 2,250.74</u>
Total income		23,462.04
		<hr/>
Balance—net income plus commission..		<u>\$21,211.30</u>
		<hr/>
Commission—since commission is 10% of net income, commission must be one-eleventh of above, or		<u>\$ 1,928.30</u>

* On the full amount of \$14,000.00, the surtax rate on the first \$2,000.00 is 2%, and the surtax rate on the last \$2,000.00 is 8%, the rate increasing 1% for each \$2,000.00. Since the rate of increase is uniform, the use of an average rate gives correct results, $(2 + 8 \div 2 = 5\%)$ and \$14,000.00 by 5% is \$700.00.

EXPLANATION OF PROBLEM 1

The column headings should be self-explanatory. On each line in the computation, except the last line, column 2 is filled in first. Our first entry is \$2,000.00, this amount being exempt from normal tax and surtax, but subject to commission of 10%, or \$200.00. This amount is entered in column 3. The total accounted for to this point is now entered in column 1, namely, \$2,200.00. On the next \$4,000.00 of taxable income, a normal tax of \$160.00 and surtax of \$10.00 are payable, as entered in columns 3 and 4 respectively. Commission payable, 10% of \$4,000.00 minus \$170.00 taxes, is \$383.00 as shown. Now the

total accounted for on the second line is \$4,383.00, and the progressive total accounted for equals \$6,583.00.

The remainder of income is subject to 8% normal tax and a graduated surtax, increasing 1% by amounts of \$2,000.00. We have a choice of two methods. We may enter in column 2 the amount \$2,000.00 a number of times, extending properly each time, until we have accounted for the remaining income except a balance less than \$2,000.00. The shorter method, and the one used here, is to enter in column 2 an amount which is a multiple of \$2,000.00 and will leave a balance of taxable income unaccounted for less than \$2,000.00. Inspection will generally show the proper amount, in this case \$14,000.00. The varying surtax rate is averaged, as explained in the note. Proceeding as with the lines above, we find that the progressive total accounted for is now \$21,801.00, leaving a balance of \$1,661.04 still to be apportioned between taxes, net income after taxes and commission; and this amount is now entered in column 1.

While we have yet to solve for the exact amounts of each of the elements composing the amount \$1,661.04, we know the relation which each of these elements bears to taxable income. This relation is fixed by the tax laws or the conditions of the problem, as follows:

Normal tax	8%	of taxable income		
Surtax (on income over \$2,000.00)	9%	“	“	“
Income after taxes (100%—17%)	83%	“	“	“
Commission is 10% of income after taxes, and is therefore.....	83%	“	“	“
The amount \$1,661.04 therefore is	108.3%	“	“	“

Dividing \$1,661.04 by 108.3 gives \$15.3374, which is 1% of taxable income. Shifting the decimal point to the right two places gives \$1,533.74 as 100% taxable income, which is entered in column 2. Next multiply \$15.3374 by 8, by 9, and by 8.3, thus giving the amounts to fill in columns 4, 5 and 3, respectively. The method here given of finding the relation between the various elements composing the balance of \$1,661.04 is the key to the process of solution and is practically the only step in the solution which may not be performed mentally.

Proof of problem 1 immediately follows the demonstration. It will be noticed therein that the final commission amount, which

Commission Problems Simplified

proves the result, is determined by dividing total income less taxes by 11. Conditions of the problem stated that commission was to be considered as expense of the business in determination of net income, before computing commission. Therefore income less taxes, containing net income and commission, equals 110% of net income and is equal to 11 times the commission.

If conditions of the problem required that commission was not to be considered an expense, the amounts shown in column 3 would be equal to 1/9 of the respective amounts obtained by deducting the sum of columns 4 and 5 from column 2, since, under such a condition, the relation between net income and commission would be as 90 is to 10. And the final proof would be obtained by taking as commission 1/10 of total income less taxes. The totals of tax and commission columns, of course, would be different. The procedure would in all other respects be the same. In all the problems which follow, commission has been treated as expense. The preceding explanation should be sufficient to make thoroughly clear the method of solution if treated otherwise.

PROBLEM 2

A sole proprietor agrees to pay his sales manager 10% commission on the increase in net profits over the profit earned in the previous year. Commission is to be computed on the basis of income after taxes in each year, and the commission, when determined, is to be considered an expense of the business. Income after taxes last year was \$9,763.26; income this year, before taxes and commission, amounts to \$23,462.04. Compute taxes and commission for this year.

SOLUTION OF PROBLEM 2

(1) Progressive total accounted for in column 2 + 3	(2) Taxable income	(3) Commission 10% col. 2— (4 + 5) after \$9,763.26 in column 6	(4) Normal tax	(5) Surtax	(6) Net income after taxes
\$ 2,000.00	\$ 2,000.00	.....	Exempt	Exempt	\$2,000.00
4,000.00	4,000.00	.....	\$ 160.00	\$ 10.00	3,830.00
<u>\$6,000.00</u>					
4,000.00	4,000.00	.....	320.00	100.00	3,580.00
401.43	401.43	.....	32.11	16.06	353.26
<u>\$10,401.43</u>	<u>\$10,401.43</u>	.....	\$ 512.11	\$ 126.06	<u>\$9,763.26</u>
1,739.24	1,598.57	140.67	127.89	63.94	
<u>\$12,140.67</u>					
10,850.00	10,000.00	850.00	800.00	700.00	
<u>\$22,990.67</u>					
471.37	435.65	35.72	34.85	43.56	
<u><u>\$23,462.04</u></u>	<u><u>\$22,435.65</u></u>	<u><u>\$1,026.39</u></u>	<u><u>\$1,474.85</u></u>	<u><u>\$ 933.56</u></u>	

The Journal of Accountancy

PROOF OF SOLUTION

	Income	Tax
Total income	\$23,462.04	
Less commission	1,026.39	
	<hr/>	
Taxable income	\$22,435.65	
Exemption	2,000.00	
	<hr/>	
Balance subject to tax	\$20,435.65	
Normal tax:		
4% on	4,000.00	\$ 160.00
8% on	\$16,435.65	1,314.85
	<hr/>	<hr/>
Total normal tax		1,474.85
Surtax:		
Taxable income	\$22,435.65	
Exempt from surtax	5,000.00	
	<hr/>	
Balance subject to surtax	\$17,435.65	
As per table of surtax rates	17,000.00	\$ 890.00
10% on balance of	435.65	43.56
	<hr/>	<hr/>
Total surtax		\$ 933.56
Total tax		\$ 2,408.41
Total income		23,462.04
		<hr/>
Income after taxes		\$21,053.63
Income after taxes—previous year ...		9,763.26
		<hr/>
Increase in net income, on which commission is based, and the commission itself, is included in the difference, which therefore represents 110% net income		\$11,290.37
		<hr/>
Commission, 10% or 1/11 of above		\$ 1,026.39
		<hr/> <hr/>

EXPLANATION OF SOLUTION—PROBLEM 2

The conditions here given appear to be more difficult of solution than those of problem 1, but the same principle may be applied, with very minor changes in detail. It will be noticed that the amount stated as net income for last year is actually net income after taxes. Column 6 is added for the demonstration of this problem, and is headed "Net income after taxes." This additional column controls the computation up to the point where the amount of last year is reached. Incidentally it is apparent that column 1 at this point shows the extent of income before taxes for last year, that is, \$10,401.43. If the rates of tax were different last year, this latter statement would not be true; but a change in tax rates would not change the details of the solution, under the conditions given.

Commission Problems Simplified

Column 2 is filled in with the amounts \$2,000.00 and \$4,000.00, respectively, these amounts representing the limits at which the tax rate changes. The other columns are extended in the same manner as explained for problem 1. By inspection we find that \$4,000.00 more can be entered in column 2, and extended without passing the limit set for the total of column 6, which is now found to be \$9,410.00. It is now clear that the entries on the next line are controlled by the fact that the amount to be entered in column 6 must be \$353.26, bringing the total thereof to \$9,763.26. Therefore this line is worked from right to left, the controlling figure \$353.26 being first entered in column 6. The surtax rate is 4% between \$10,000.00 and \$12,000.00, and the normal tax rate is 8%. Therefore \$353.26, representing net income after taxes, equals $100\% - (8\% + 4\%)$, or 88% of taxable income. And 353.26 divided by 88 equals 4.0143, making taxable income, as entered in column 2, 100 times this amount. Normal tax, at 8% equals \$32.11, and surtax at 4%, \$16.06. To this point, totals of column 1 and 2 are equal, since commission is payable only on income greater than that earned last year. From this point on column 1 controls, and column 6 is not necessary to the solution.

The next amount entered in column 2 should be such as to bring the new total of column 2 to a multiple of \$2,000.00, since this amount marks a change in surtax rate, and \$1,598.57 is the correct figure. The same normal and surtax rates apply as in the line just above. From this point to the end the procedure is the same as employed in problem 1, and a detailed explanation is unnecessary. A slight variation from problem 1 is found, since the surtax rate for the last line is 10%, instead of 9% as in the previous problem. Normal tax, 8%, and surtax, 10%, leave net income after taxes at 82% of taxable income. Commission is therefore 10% of 82%, or 8.2% of taxable income. The amount \$471.37, which is entered in column 1 to bring the total thereof to \$23,462.04, is hence divided by 108.2, instead of by 108.3 as in the previous problem. Proof immediately follows the solution.

PROBLEM 3

A corporation, with invested capital of \$80,000.00, has agreed to pay its sales manager 15% of net profits after income and excess profits have been deducted. Income before taxes and

The Journal of Accountancy

commission equals \$19,764.80. Compute taxes and commission, considering the commission itself as an expense in the determination net profits.

SOLUTION OF PROBLEM 3

	(1) Progressive total acc'ted for in cols. 2 + 3	(2) Taxable income	(3) Commission 15% of column 2 minus cols. 4 + 5	(4) Excess- profits tax	(5) Income tax
	\$ 2,300.00	\$ 2,000.00	\$ 300.00	Exempt	Exempt
	8,399.00	7,400.00	999.00	Exempt	\$ 740.00
	<u>\$10,699.00</u>				
	7,312.80	6,600.00	712.80	\$1,320.00	528.00
Totals—first bracket	\$18,011.80	\$16,000.00	\$2,011.80	\$1,320.00	\$1,268.00
“ —second “	1,753.00	1,621.65	131.35	648.66	97.30
Totals . . .	<u>\$19,764.80</u>	<u>\$17,621.65</u>	<u>\$2,143.15</u>	<u>\$1,968.66</u>	<u>\$1,365.30</u>

PROOF OF PROBLEM 3

	Income	Tax
Total income	\$19,764.80	
Less commission	<u>2,143.15</u>	
Taxable income	<u>\$17,621.65</u>	
Excess-profits tax:		
20% of invested capital	\$16,000.00	
Excess-profits credit:		
8% invested capital.....	\$6,400.00	
Exemption	<u>3,000.00</u>	
Balance taxable at 20%	6,600.00	\$ 1,320.00
Over 20% of invested capital, taxable at 40%	<u>\$ 1,621.65</u>	<u>648.66</u>
Total excess profits		\$ 1,968.66
Income tax:		
Taxable income	\$17,621.65	
Less:		
Excess-profits tax	\$1,968.66	
Exemption	<u>2,000.00</u>	
Income tax—10% on	13,652.99	1,365.30
Total tax		\$ 3,333.96
Total income		<u>19,764.80</u>
Income after taxes, which includes com- mission, and therefore is 115% of net income		<u>\$16,430.84</u>
Net income, 100/115 of \$16,430.84		\$14,287.69
Commission, 15% of net income		<u>2,143.15</u>
		<u>\$16,430.84</u>

EXPLANATION OF PROBLEM 3

The principle applied in problems 1 and 2 will serve as well in the solution of problems in which the taxpayer is a corporation. Columns 4 and 5, respectively, are used for excess-profits and income-tax amounts, instead of income and surtax as in the previous problems. Excess-profits tax is applied as a credit in computing income tax on each line, thus differing from the method used in computing the amounts to be entered in columns 4 and 5 when the taxpayer is an individual.

Column 2 is filled in first on each line up to the limit of taxable income in the 20% bracket, namely, \$20,000, under the conditions given. We know that \$9,400 is exempt from excess-profits taxes, i. e., 8% of \$80,000, or \$6,400, in addition to a flat exemption of \$3,000. Of this \$9,400, \$2,000 is exempt from income tax as well. Column 2 is thus filled in with the amounts which mark the variations in rate of tax. The first \$2,000 is exempt from all taxes. The next \$7,400 is exempt from excess-profits tax (total excess-profits credit, \$9,400), but is subject to income tax of 10%. The balance in the 20% bracket, or \$6,600, is subject to 20% excess-profits and income tax of 10% on the remaining 80% thereof. The entry in column 4 is \$1,320, and the entry in column 5 is \$528, this amount being 10% of \$5,280 (\$6,600 — \$1,320).

A total of column 1 at this point shows the amount, in this case \$18,011.80, which is the limit of total income affected under the first bracket. Totals of the last three columns show the amounts of commission and taxes, respectively, which attach thereto.

Column 1 now becomes the control, and therein is entered the amount which will bring the total of this column to the amount given in the problem as total income, that is \$19,764.80. Entering \$1,753.00 in column 1 will give the total required. As in the previous problems, this amount is now separated into the various elements composing it, the relation of which, each to the other, is fixed either by the tax law or the conditions of the problem.

The relation may be expressed as follows:

Excess-profits tax equals	40 %	of taxable income
Income tax—10% of the remaining		
60% equals	6 %	“ “ “

The Journal of Accountancy

Net income is therefore	54 %	“	“	“
Commission, 15% of net income (or 15% × 54% taxable income)...	8.1%	“	“	“
	108.1%	“	“	“
\$1,753.00 is found to be				

It follows from the relations expressed above that \$1,753.00 divided by 108.1 will disclose a quotient which is 1% of taxable income. The amount is \$16.2165. Taxable income under the second bracket is, therefore, 100 times this figure, or \$1,621.65. And multiplying \$16.2165 by 8.1, by 40 and by 6, respectively, will give the proper amounts to be entered in columns 3, 4 and 5.

In addition to the method of apportionment outlined above, an important feature is that column 1 controls whenever a point is reached where the balance of taxable income is subject to the same tax and commission rates throughout. Let us suppose that total income had been \$18,000.00. It is clear that no tax would have been payable in the second bracket. In this event, column 1 would control the line beginning with \$7,312.80, and the amount entered therein would be \$7,301.00, the resulting total of column 1 being \$18,000.00, the amount of total income. The balance of \$7,301.00 would be subject to the same tax rate throughout, and apportionment thereof would be made in the same manner as that in which the amount of \$1,753.00 is apportioned in the demonstration of problem 3. The difference in tax rate, 20% instead of 40%, will result in the following relations between the elements:

Excess-profits tax equals	20 %	of taxable income	
Income tax—10% of the remaining 80% equals	8 %	“	“
Net income therefore is	72 %	“	“
Commission, 15% of net income (or 15% × 72% of taxable income).	10.8%	“	“
\$7,301.00 is found to be			

from which the amount of each of the various elements can be computed.

PROBLEM 4

A corporation, with invested capital of \$80,000.00, has agreed to pay its sales manager a commission on net income, after taxes are deducted, on a sliding scale.

Commission Problems Simplified

- 15% on the first \$5,000.00 of net income,
- 10% on the next \$5,000.00 of net income,
- 5% on the balance of net income.

Commission is to be considered an expense of the business in the determination of net income.

SOLUTION OF PROBLEM 4

(1) Progressive total accounted for in columns 2 + 3	(2) Taxable income	(3) Commission rate times column 6	(4) Excess- profits tax	(5) Income tax	(6) Income after taxes and commission
\$ 2,300.00	\$ 2,000.00	\$ 300.00	Exempt	Exempt	\$2,000.00
3,783.33	3,333.33	450.00	Exempt	\$ 333.33	3,000.00
4,432.67	4,066.67	366.00	Exempt	406.67	3,660.00
1,995.11	1,861.11	134.00	\$ 372.22	148.89	1,340.00
4,909.49	4,738.89	170.60	947.78	379.11	3,412.00
<u>\$17,420.60</u>	<u>\$16,000.00</u>	<u>\$1,420.60</u>	<u>\$1,320.00</u>	<u>\$1,268.00</u>	<u>\$13,412.00</u>
2,344.20	2,282.57	61.63	913.03	136.95	1,232.59
<u><u>\$19,764.80</u></u>	<u><u>\$18,282.57</u></u>	<u><u>\$1,482.23</u></u>	<u><u>\$2,233.03</u></u>	<u><u>\$1,404.95</u></u>	<u><u>\$14,644.59</u></u>

PROOF OF SOLUTION—PROBLEM 4

	Income	Tax
Total income	\$19,764.80	
Less commission	1,482.23	
	<u>\$18,282.57</u>	
Excess-profits tax:		
20% of invested capital	\$16,000.00	
Less:		
Excess-profits credit,		
8% invested capital	\$6,400.00	
Exemption	<u>3,000.00</u>	
	9,400.00	
Tax of 20% on	\$ 6,600.00	\$ 1,320.00
Tax of 40% on	<u>2,282.57</u>	<u>913.03</u>
Total excess profits		<u>\$ 2,233.03</u>
Income tax:		
Taxable income	\$18,282.57	
Less:		
Excess-profits tax	\$2,233.03	
Exemption	<u>2,000.00</u>	
	4,233.03	
10% on	<u>\$14,049.54</u>	<u>1,404.95</u>
Total tax		<u>\$ 3,637.98</u>
Total income		<u>19,764.80</u>
Balance, which includes net income and commission, equals		<u><u>\$16,126.82</u></u>

The Journal of Accountancy

This amount, under the conditions stated, is made up as below:

	Net income	Commission rate	Commission amount	Total
First	\$ 5,000.00	15%	\$ 750.00	\$ 5,750.00
Second	5,000.00	10%	500.00	5,500.00
Balance	4,644.59*	5%	232.23	4,876.82
	<u>\$14,644.59</u>		<u>\$1,482.23</u>	<u>\$16,126.82</u>

EXPLANATION OF SOLUTION—PROBLEM 4

Column 6 is added in this solution and is a control column up to the point where \$10,000.00 of net income is reached. This column is made necessary by the fact that the rate of commission changes at \$5,000.00 intervals, to \$10,000.00 net income, at which point the rate remains 5% for the balance.

On the first line, \$2,000.00, entered in column 2, is exempt from all taxes, but subject to commission amounting to \$300.00. The same amount is entered in column 6. The latter column now controls, and \$3,000.00 is entered therein, this amount being the balance subject to 15% commission, as entered in column 3. While exempt from excess-profits tax, income tax at 10% is payable on all taxable income over \$2,000.00. The amount entered in column 6, therefore, is 90% of taxable income, and 100%, or \$3,333.33, is entered in column 2, which controls the next line. Under taxable income is now entered \$4,066.67, making the total of column 2 to this point \$9,400.00, the limit of excess-profits tax exemption. Deducting 10% tax leaves \$3,660.00 to be entered in column 6. Commission, now at 10%, is \$366.00.

From this point on, to a total of \$16,000.00 in column 2, taxable income is subject to 20% excess-profits and 10% income tax. Column 6 now controls, on account of the varying rate of commission. Under the conditions given, there remains \$1,340.00 of net income subject to commission at the 10% rate. Commission thereon is \$134.00 as entered. Excess-profits tax is 20%; income tax is 10% of the remaining 80%, or 8% of taxable income. Therefore \$1,340.00 represents 100% — 28%, or 72% of the amount to be entered in column 2 as taxable income. This amount, \$1,340.00, divided by .72 equals \$1,861.11, 20% equals \$372.22, and 10% of the remainder is \$148.89.

* The last line is computed by dividing \$4,876.82 by 105%, since this balance consists of 100% net income plus 5% commission. Column 1 and 3 are the results of multiplying the quotient thus found by 100 and 5, respectively.

Commission Problems Simplified

Since the balance of income is subject to the same rate of commission throughout, column 6 will not control any further computations. In column 2 is entered an amount sufficient to bring the total thereof to \$16,000.00, the total taxable under the 20% bracket. The correct entry is found to be \$4,738.89. Excess-profits tax, at 20%, equals \$947.78; income tax, 10% of the balance, equals \$379.11. Income after taxes amounts to \$3,412.00, and commission at 5% is \$170.60. A total of column 1 at this point shows that we have accounted for and prorated \$17,420.60. It is clear that, under the conditions given, income before taxes and commission amounting to more than \$17,420.60 would have to be earned before any part thereof is subject to the 40% tax rate of the second bracket.

Column 1 controls the computation for the second bracket. Therein is entered \$2,344.20, bringing the total of column 1 to \$19,764.80. As in the previous problems, this amount is now separated into the elements composing it, the relations of which, each to the other, are fixed by the tax laws or the conditions of the problem. The relation is as follows:

Excess-profits tax equals	40	%	of taxable income
Income tax, 10% of the remaining			
60%, equals	6	%	“ “ “
Net income after taxes			
(100%—46%)	54	%	“ “ “
Commission, 5% of net income, or			
5% of 54% of taxable income . . .	2.7	%	“ “ “
\$2,344.22, therefore, equals	102.7	%	“ “ “

from which the balance of taxes, commission and net income can be computed. Totals of the various columns now give the requirements of the problem. Proof of the results is given immediately following the solution.

While the explanation of each problem as given is necessarily lengthy, it will be seen that the computation itself is comparatively brief. No higher degree of mathematical knowledge is required than multiplication and division, coupled with the ability to make a logical analysis by columnar arrangement. In fact, most of the computations may be made mentally.

The 1920 tax rates are used throughout, as amendments affecting 1921 rates had not been passed at the time this article was in course of preparation.

The problems given contain all the ordinary conditions most likely to be encountered. A study of the methods outlined will show that, by very little further detailed analysis, practically any problem of this nature, no matter how intricate, can be solved by the application of the same principles.