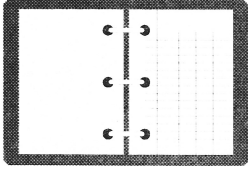


PUZZLE #16 — FREIGHT BILLING



The Acme Metal Works requested a detailed breakdown of the Denver Midland Railway's bill, in the amount of \$1750*, for expediting a series of shipments to them last month. The document which the D.M. traffic department provided to the Acme controller's office showed the amount of money charged by the D.M. for shipping each of four commodities to Acme, further broken down by the amount in tons of each commodity as well as the freight rate, per ton, established by the I.C.C. for that commodity (the rates are all different; in order, low to high, they are: steel rivets, aluminum sheet, iron pipe, and bronze bushings). Also included was the railroad on which each shipment originated, and the amount charged by the D.M. operating department as expenses to cover the use of special trains to expedite the shipments.

**(The Denver Midland exists in 1948. If this figure seems to you to be too low for a modern railroad, just multiply everything by 1000).*

Determine, for each commodity, the originating railroad; the freight rate per ton; the number of tons shipped (all shipments are rounded to the nearest ton); and the total charged for each item, as well as the total amount of the D.M.'s additional expenses.

1. The D.M. expenses were exactly half the amount billed for the shipment from the Santa Fe.
2. The amount billed for the shipment originating on the Rock Island was exactly twice the amount billed for the shipment of steel rivets.
3. Acme received exactly 200 tons of steel rivets.
4. The I.C.C. rate for iron pipe is \$2.00 per ton.
5. Exactly \$550.00 was billed for the shipment of sheet aluminum.
6. The I.C.C. rate for the material shipped from the location on the Colorado & Wyoming was one-third of the rate for the shipment from the Rock Island, and the rate for the Santa Fe shipment was exactly two-thirds of the rate charged for the shipment from the Rock Island. The Colorado & Wyoming-originated shipment was charged at a higher rate than the shipment originating on the Texas & Pacific.
7. The amount billed for the D.M.'s expenses was exactly one-seventh of the total bill.

DENVER MIDLAND RAILWAY COMPANY

EXPENSES IN CONNECTION WITH EXPEDITED SHIPMENTS TO Acme Metal Works

Originating Railroad	Commodity	<i>a</i> Tons	<i>b</i> Rate per Ton	<i>a</i> × <i>b</i> Total Billing
A T & S F				
C R I & P				
Colo. & Wyoming				
Texas & Pacific				
Denver Midland's additional expenses				
			Grand Total	\$1750.00