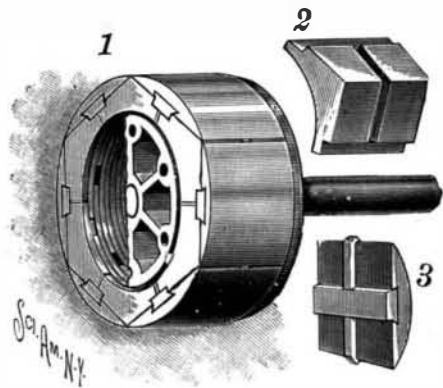


AN IMPROVED METALLIC PISTON PACKING.

This is a segmental piston packing in which the parts are so arranged that displacement of the segments in any direction is impossible as long as the packing is in position on the piston. It has been patented by Mr. Nicholas Pflaum, of Port Jervis, N. Y. It consists of a series of interior blocks having angular exterior surfaces on which fit the angular surfaces of exterior segments, longitudinal keys fitting between the blocks and segments. Fig. 1 represents the arrangement of the packing in use, and Fig. 2 shows one of the interior blocks. On the inner face of each of these blocks is



PFLAUM'S METALLIC PISTON PACKING.

formed a segmental offset, fitting on the exterior surface of the spider of the piston, the inner faces of the blocks, to one side of the offset, being also segmental, and forming with the spider an annular recess in which are placed springs to press the blocks outward. On two adjoining outer angular surfaces of two succeeding blocks is fitted an exterior segment, shown in Fig. 3. Each segment has tongues on its inner surface to fit into corresponding grooves on the outer surface of the blocks, and in each of the segments is a transverse dovetail in which fits a projecting key, engaging a transverse groove in two adjacent blocks. This form of packing is recommended for use in the cylinders of air pumps, to prevent leakage, and is adapted to afford efficient service in a wide variety of uses.

AN AUTOMATIC ADDING AND RECORDING MACHINE.

A machine by means of which figures may be placed in tabular order with the rapidity of ordinary typewriting, and which at the same time automatically adds the amount as the figures are listed, with no possibility of a disagreement between the listed figures and their indicated total, is represented in the accompanying illustration. The machine is adapted to record and foot up eight columns of figures, while a similar machine is also made having a capacity reaching to ten columns. As will be seen, there are eight columns of keys, the first two columns to the right, in listing amounts of money, being used for the units and tens of cents, the next three columns for the units, tens, and hundreds of dollars, and the remaining three for units, tens and hundreds of thousands, the machine being thus adapted to all amounts under a million dollars.

To record the amount 179.63, shown at the bottom of the paper just back of the keys, the operator struck key 1 in the fifth column, key 7 in the fourth column, key 9 in the third column, key 6 in the second column, and key 3 in the first column, and then pressed the up-feeding spacer lever seen to the right of the key board. The amount recorded is thus presented in plain sight before the next figures are listed, the operation of which is proceeded with after the same manner, each separate amount being exposed to view, by pressing on the spacer lever, before commencing upon the following amount. The total of any number of amounts printed can at any time be seen upon the type wheels behind the glass just in front of the keys; but to print the answer on the slip at the bottom of the column, the operator presses the knob standing at the left of the keyboard. The little thumb screw on the right of the machine is to clear the register, or reduce the machine to naught, another thumb screw farther back regulating the feeding of the paper, while the lever device near it is for feeding the paper backward. The machine will take paper of any width up to six inches.

The comptograph is an outgrowth of the comptometer, a universal figuring machine operated by keys, but which does no printing. The comptograph simply prints lists or columns of items and adds and automatically prints the answer beneath them at

the same time. For listing checks in a bank, for the use of insurance companies, for the preparation of such extended tables as are furnished by various statistical authorities, and for other purposes where clearness and rapidity of work, no less than accuracy, are difficult to obtain, this machine has already proved itself a great success. Besides its advantages in clearness and accuracy, it is said that an operator can, with very little practice, do as much work as can be done by two men in the old way. The machine is the invention of Mr. Dorr E. Felt, being covered by several patents, and is manufactured by the Felt & Tarrant Manufacturing Company, of Chicago, Ill.

An Ingenious Swindler.

The incident of the arrest of a man in London for the attempt to swindle a jeweler in that city, by means of the "philosopher's stone," through which he pretended to increase the bulk of gold, brings to mind the attempt and success to the amount of \$100,000, which some Baltimore gentlemen were done out of about three years ago.

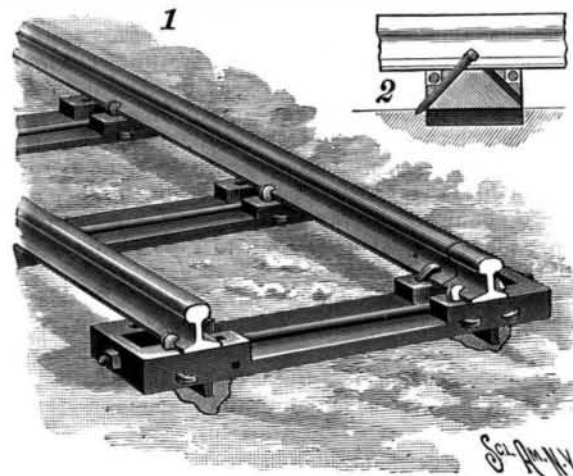
The *N. Y. Tribune*, which published the account of the arrest a few days ago, concludes that the culprit in limbo is the same individual who swindled the Baltimorean merchants in a similar ingenious manner, as follows: About three years ago a man came to Baltimore and introduced himself to a real estate agent as Mr. Gephart. He unfolded his scheme of increasing the bulk of gold, and invited the agent to call at his rooms. The agent gave Gephart a gold dollar, which was placed in a small crucible and a white powder was added by Gephart. The two men took turns at a blowpipe in increasing the heat of the crucible until the gold was melted and mixed with the chemical. It was then allowed to cool, after which Gephart took it out, gave it to the agent and told him to send it to the United States Mint to be assayed and recoined. The mint officials returned a report showing three times the amount of gold that was put into the crucible. The real estate agent became convinced of the value of Gephart's secret, and introduced Gephart to several wealthy citizens, and they too became convinced of Gephart's ability to increase the bulk of gold.

A stock company was formed, and the basement of the house of one of the men interested was selected as the place of operations. One of the gold increasing company furnished about \$50,000 in gold and the other four about \$10,000 each. In the presence of the whole party Gephart apparently put all this gold into one of the vats and placed it on the fire. He then put in a quantity of the powder and other chemicals. In doing this, however, he declined to permit any of the party to approach the vat, saying that the fumes of the

that the vat must not be opened for three weeks. After remaining about the city for several days, Gephart said he was called to a distant city on business, but would return on the day appointed for taking out the gold. He did not come as promised. The real estate agent became suspicious, and persuaded the party to make an investigation. They went to the cellar, and upon opening the vat found that the gold had all disappeared, while in its place was a lot of rocks and scrap iron. The men were dumfounded. The cellar had been entered surreptitiously and the gold stolen.

AN IMPROVED METALLIC RAILROAD TIE.

A metallic railroad tie of very simple form, designed to be durable in use, and which permits of the use of



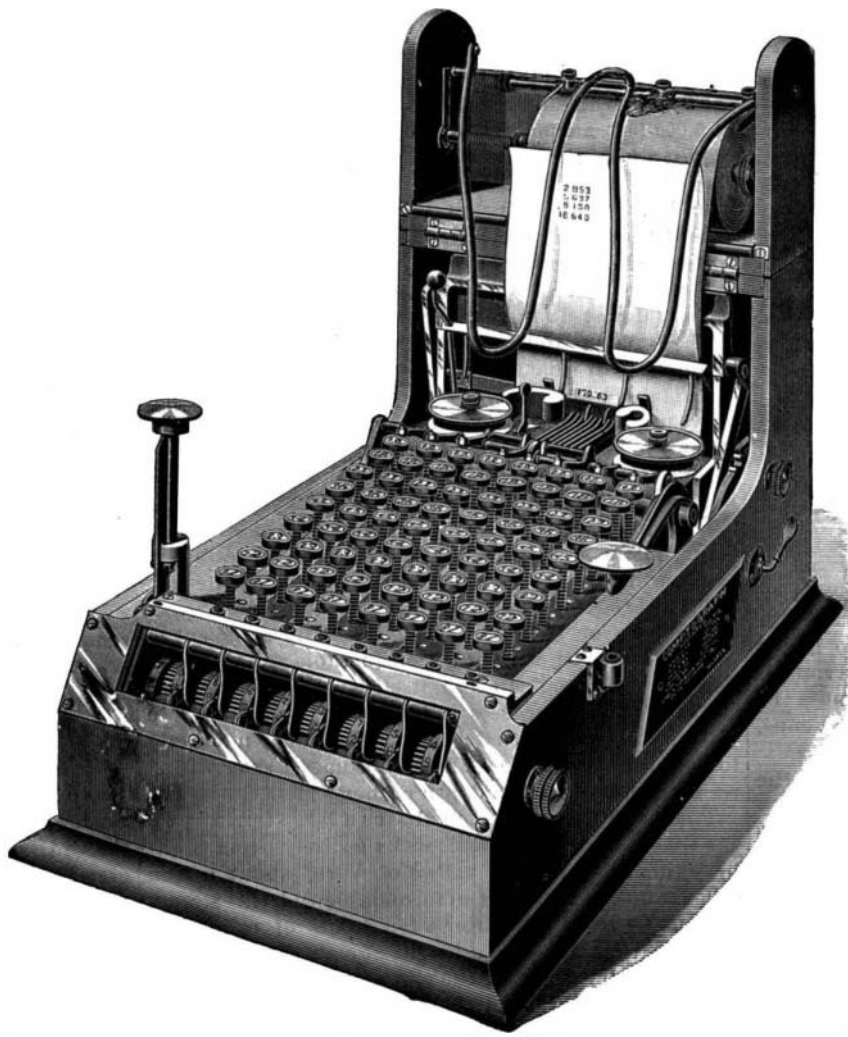
SAUNDERS' METALLIC RAILROAD TIE.

ordinary spikes for securely fastening the rails in position, is shown in the accompanying illustration, and has been patented by Mr. Ellison Saunders, of Austin, Texas. Integral with the base plate of the tie, and at each end thereof, are recessed blocks, flat on top, to form a solid rest for the base of the rails without adding unnecessarily to the total weight of the tie. To strengthen the base plate, and to serve as braces, the recessed blocks at the end of each tie are connected by a rod, on one end of which is a head, while the other end is provided with a tightening nut. Each of the blocks has four diagonal apertures for the passage of ordinary spikes, the heads of which engage the base of the rail, while their points are clinched on the outside of the blocks as shown in Fig. 1. Ordinarily two spikes only will be sufficient for each block, one at each side of the rail, but when two rails are joined together over the block, four spikes will be employed to hold the ends of both rails firmly in place. The blocks at the ends of the base plate may, if desired, be connected by two brace rods, in which case the rods are placed over the base plate at the sides, as shown in the sectional view, Fig. 2, the fastening spikes then passing through the blocks under the rods. On the under side of the base plate, near each end, are transverse lugs, in line with the rails, to prevent lateral movement of the tie and assist in anchoring it in place.

Pancreatic Juice.

In the person of a patient recently operated on in Warsaw for tumor of the pancreas, an opportunity has occurred of ascertaining the composition of human pancreatic juice. After the removal of the tumor by the thermocautery a drainage tube was inserted, and when the discharge ceased to be purulent and assumed the character of pancreatic juice alone, it was examined. It formed a tenacious yellowish turbid liquid, with a distinctly alkaline reaction. At a temperature of 100° F. the juice actively converted starch into maltose, egg albumen into peptone, and olive oil into an emulsion. On analysis it gave water 86.405 per cent, organic compounds 13.251 per cent, including albuminoid bodies 9.205 per cent, and extractive matters soluble in alcohol. Salts—consisting of carbonates, chlorides, phosphates, and sulphates of sodium, potassium, calcium, and iron—0.344 per cent. On comparing the human pancreatic juice with that of other animals, it was found to resemble most nearly that of the dog, according to Schmidt's analysis.—*Lancet*.

WITH one or two trifling exceptions, the submarine cables of the world, which stretch over 120,000 nautical miles, and have cost 200,000,000 dollars, are of British construction.



THE COMPTOGRAPH.

chemicals would overpower any one not prepared to resist them. A top was put on the vat, and at the suggestion of Gephart extra strong locks were procured, and the vat was securely fastened with them. The same precautions were taken with the door of the basement. The keys were given to the man in whose house the experiment was being tried. Gephart said