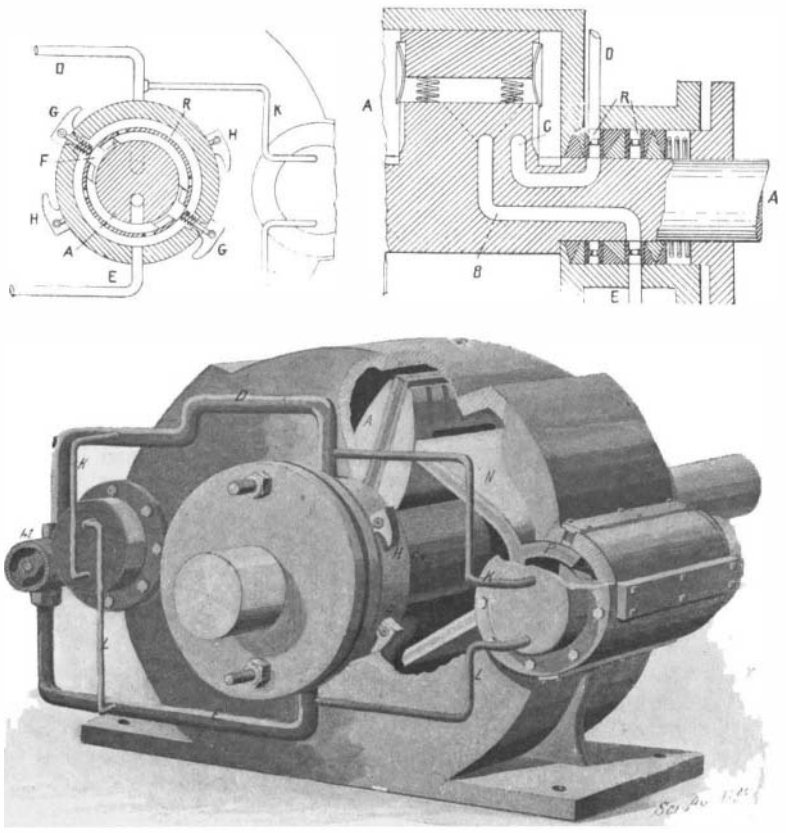
## A NOVEL ROTARY ENGINE.

Among the many recent developments in rotary engines one worthy of special notice is that shown in the accompanying illustrations. A patent on this engine has recently been granted to Oliver C. Jones, of the United States Navy, residing at 315 Carson Street, Manayunk, Philadelphia, Pa. Mr. Jones' engine embodies some very novel features of construction. The peculiar arrangement enables him to drive his engine in either direction and to utilize the steam force under continuous impact or, with certain cut-off devices, to work the engine expansively for such periods of its operation as may be desired.

The general view of the engine is broken away to show the piston, *A*, and one of the reciprocating abutments, *N*, which co-act with the piston to turn the main shaft. The cylinder or casing is provided with two offset portions at each side in which the abutments, *N*, are permitted to rock. The abutments are connected in pairs to two shafts journaled respectively in boxings at either side of the cylinder. Projecting from each abutment is a tailpiece, *P*, these tail-pieces working in cavities formed in the boxings. The cavities are each divided by a horizontal strip into an upper and lower compartment. The ports which lead therein have connection with the steam pipes, *D* and *E*, through pipes, *K* and *L*, respectively. It will be noticed that pipe *K* leads to the upper compartment and pipe *L* to the lower compartment in the right-hand boxing, while the reverse holds true at the left. A four-way valve *M* is provided, whereby either one of the pipes *D* and *E* may be connected to the steam supply, while the other is connected with the exhaust. As shown, this valve is turned to supply pipe *D* with live steam, and pipe *E* communicates with the exhaust. Reference to the sectional view at the right will explain the course of the steam into the cylinder. This section is taken longitudinally through the engine shaft and the piston *A* formed thereon. Within the elongated box through which the shaft, *A*, extends are two annular channels formed by the chamber rings, *R*. These rings have an H-shaped cross section, and the webs or horizontal portions are perforated at various points along their extent. The inlet pipe *D* connects with the chamber at the left, and the exhaust pipe *E* connects with that at the right. Two ports lead from these steam chambers to the piston; one, the inlet port, communicating to the right-hand face of the piston, as shown in the general view; and the other, the exhaust port, leading to the left-hand face. When live steam is admitted into pipe *D*, a portion of the steam is led through the pipes *K* into their respective compartments where, acting on the tail-pieces, *P*, it swings the abutments on the left upward and rocks those on the right downward. The upper right-hand abutment, and the lower left-hand abutment are thus rocked into engagement with the piston, while the other two abutments take up positions out of the path of the piston within their respective offset recesses in the cylinder casing. Steam entering the cylinder through port *C* expands and forces the piston to the left. As the piston passes beyond the end of the upper left-hand abutment, steam flows into the recess back of the same and forces it downward. The piston will then engage the lower left-hand abutment, and aided by the steam pressure just referred to, will rock the two abutments downward. After the piston passes the lower abutment, the two abutments will rock back under steam pressure on the lower left-hand tail-piece *P*, to the upper position. While rocking to this position, the lower abutment rides along the steam-feeding face of the piston. A number of grooves are formed on each face of the piston just above the ports *B* and *C*. These grooves serve as by-passes which in this case permit the steam to pass downward below the lower left-hand abutment and, entering the offset recess, to press on this abutment and accelerate its return. The operations above described now take place on the right hand, the motions of the abutments, however, being reversed. Thus the piston is continuously rotated in one direction. When it is desired to reverse the engine, the valve *M* is turned, admitting steam through pipe *E* to port *B*. The abutments are also rocked to reverse position by steam entering through pipes *L*. Thus the piston is caused to rotate in the opposite direction. Suitable packings are provided throughout in order to make the parts all thoroughly steam-tight, and the novel methods of arranging these strips form a very important feature of the invention, which limited space does not permit us to describe.

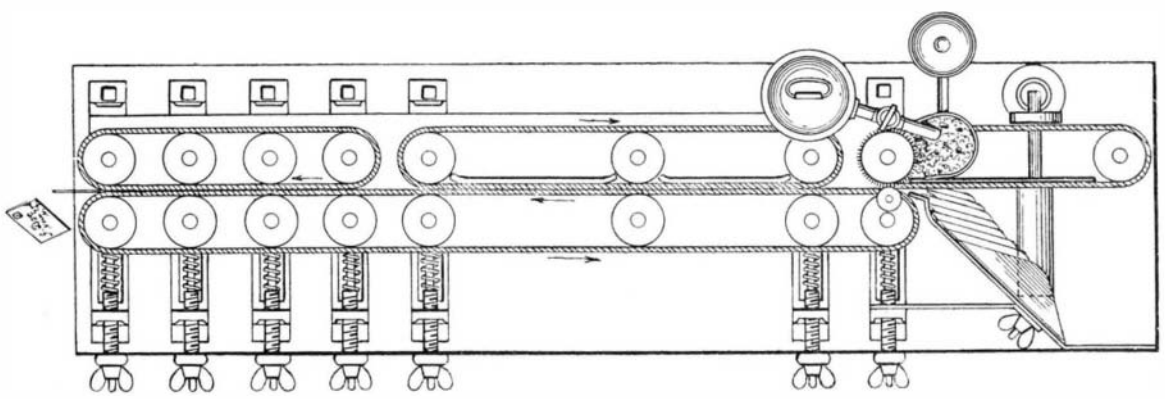


A NEW TYPE OF ROTARY ENGINE.

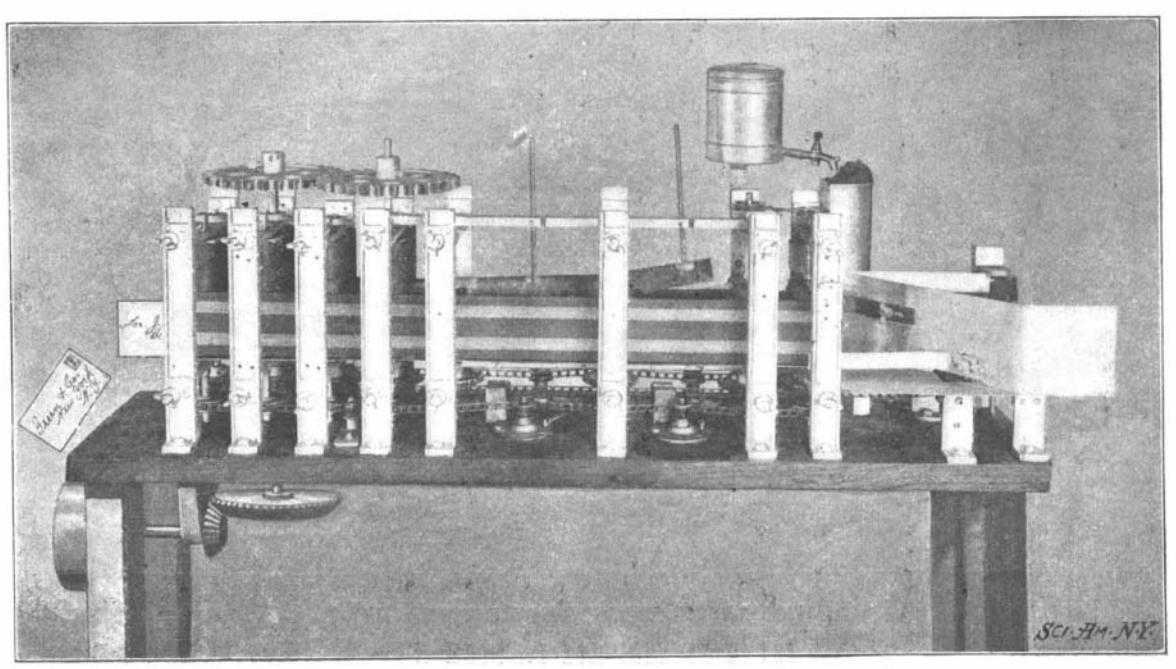
Bearing on the engine shaft within the steam chambers formed by the rings *R*, are several cut-off shoes *F*, which are adapted to close the ports *B* and *C* during part of their rotation. The cut-off shoes are shown in detail, in one of our sectional views. The shoes may be lifted out of engagement with the shaft by finger-cams *G* and *H*. With the steam feeding into the engine through pipe *D*, as shown, the shoes which close the port *B* are inert elements, and may be raised, if desired. The other shoes, however, should be allowed to bear on the shaft, so as to alternately cover and uncover the feed port, *C*. The steam is thus greatly economized, the piston being driven by the expansion of the steam, while the inlet port is closed. The periods at which the port is closed may be varied according to the size and number of shoes employed.

## ENVELOPE-SEALING MACHINE.

A machine which gives promise of great usefulness has recently been invented by Mr. Harry E. Gavitt, of Topeka, Kans. This apparatus is adapted to receive unsealed envelopes, moisten and fold their flaps and then firmly press the flaps to sealed position. Our illustrations show one of these machines in operation. On the extreme right will be seen the gage plate, back of which are placed the unsealed envelopes with flaps upturned. As many as fifty envelopes of mixed thicknesses may be placed in the hopper, but only one at a time will be fed forward automatically into the machine. This is regulated by the spring gage plate which is self-adjusting, allowing a wider or narrower entrance to the machine, according to the thickness of the envelopes to be sealed. The envelopes are fed forward by a roller in the floor of the hopper and by a traveling belt which forms one side of the same. Just beyond the hopper is a moistening device consisting of a roller covered with canvas, which receives the moisture from a sponge and deposits it on the gummed flap of the envelope. From this point the envelope is fed forward between two belts under the folding device, which consists of a metal sheet twisted laterally and rearwardly in such a manner as to bend the flap down before it passes under the flap holder. The latter is a piece of sheet metal, forming an inverted U in cross section, by which the flap is held in folded position, but is not pressed against the envelope. The feeder-belt at this point, which bears against the folding side of the envelope, is narrow, so as to clear the flap which is turned over. The next feeder-belt, however, has a width equal to that of the envelope, and in feeding past this the flap is firmly pressed into sealing position before being discharged from the machine. The reason for delaying the sealing action by introducing a flap-holding device is to permit the mucilage to thoroughly absorb the moisture and to become properly softened before the flap is pressed against the envelope. The sponge which supplies the moistening roller is situated in a receptacle adjacent thereto. Water is fed to the sponge from a reservoir situated above, and a can is provided at the rear of the machine into which any surplus moisture is drained. The feed and pressing rollers are driven by chain and sprocket gearing from a pair of bevel gears which are rotated by the driving pulley. The long belt, however, which is situated nearer the front of the machine is driven by frictional engagement (or chain and sprocket) with the shorter belts against which it is pressed by spiral springs. These springs, which are clearly shown in a sectional view of the machine, are self-adjusting for envelopes of unusual thickness. The machine will seal from 8,000 to 15,000 envelopes per hour of any ordinary bulk, mixed sizes, and especially adjusted will seal envelopes at about the same rate up to one-half inch in thickness.



SECTION SHOWING COURSE OF ENVELOPES THROUGH THE MACHINE.



A MACHINE FOR SEALING ENVELOPES.

The United States Naval Department is about to ask for bids for the construction of a floating drydock for the Philippines. It will be built here and floated to its destination, and will be of sufficient capacity to raise a 16,000-ton battleship. The available amount is $1,250,000.