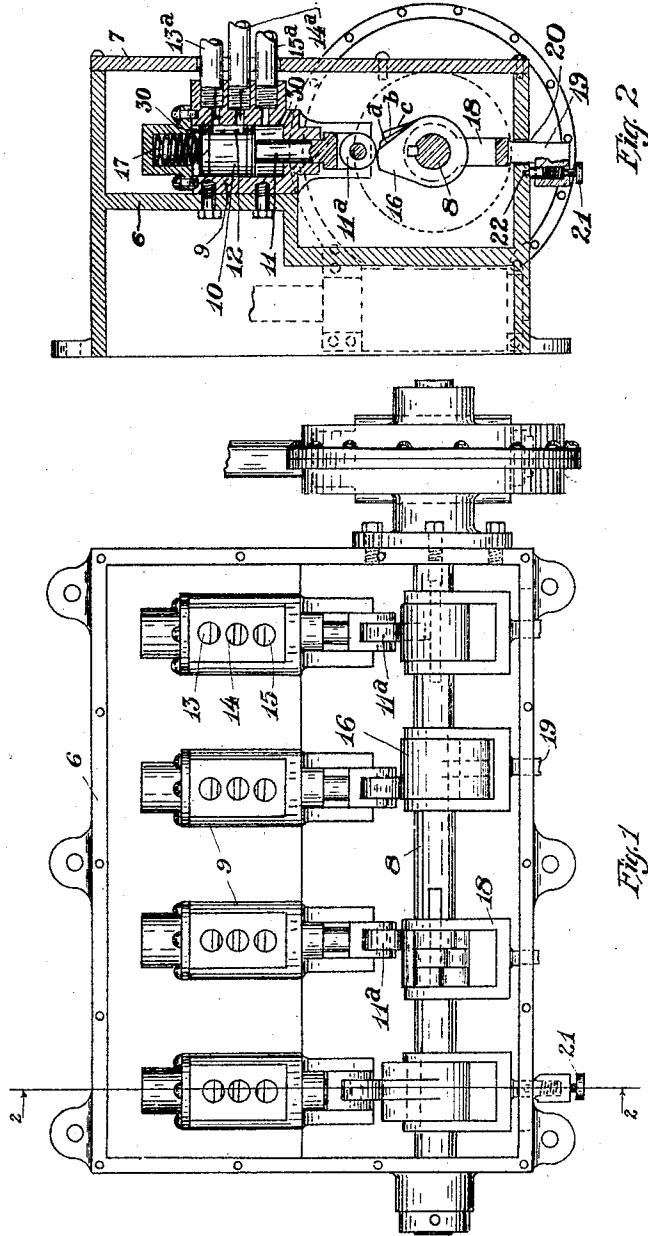


C. H. RANKIN.  
VALVE ACTUATING MECHANISM.  
APPLICATION FILED SEPT. 15, 1919.

1,365,541.

Patented Jan. 11, 1921.



Inventor

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## VALVE-ACTUATING MECHANISM.

1,365,541.

Specification of Letters Patent.

Patented Jan. 11, 1921.

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*To all whom it may concern:*

Be it known that I, CARL HENRY RANKIN, a citizen of the United States, residing at Wellsburg, in the county of Brooke and State of West Virginia, have invented certain new and useful Improvements in Valve-Actuating Mechanisms, of which the following is a specification.

In order to provide a valve mechanism capable of controlling the movement of parts in a machine in which various operations are performed in succession or otherwise by means of fluid pressure, I have devised the invention hereinafter described and shown in the accompanying drawings.

By means of this device a plurality of valves are individually operated, to admit or exhaust pressure from different operating devices at different times, and these times may be varied respectively, according to local conditions.

Thus in a glass feeding machine it may be desirable to vary the time or duration of the movement of the plunger to discharge glass from the tank; or to vary or register the actions of the heating box, blast nozzle and shears, or to slow down the actions of these various parts according to the nature of the ware being made. The present timing mechanism accomplishes these results, but is also applicable to any other automatic mechanism where the time of successive movements of various parts is important.

In the accompanying drawings, Figure 1 is a front elevation of the valve timing mechanism, with the cover removed. Fig. 2 is a section on the line 2—2 of Fig. 1.

The drawings show a gang of four valves, each controlled by a similar operating device, but the number of these parts may be varied according to the number of mechanisms to be operated, or to other local conditions. All of the valves and operating mechanisms are similar, and the description of one will answer for all. Referring specifically to the drawings 6 indicates the casing or box with a cover or front plate 7, in which the valves are inclosed. This is shown upright but it may stand horizontally if desired. A shaft 8 extends across the casing and will be driven by any suitable mechanism. Each valve comprises a cylindrical valve casing 9 fixed to the casing and containing a piston valve 10 the stem 11 of which extends through the head of the

cylinder and carries a roller 11<sup>a</sup>. The piston has a passage 12, and one side of the valve casing is provided with three ports 13, 14 and 15 communicating with separate pipes 13<sup>a</sup>, 14<sup>a</sup> and 15<sup>a</sup>. The passage 12 will lap any two of these ports, and, in connection with the machine referred to, the pipe 14<sup>a</sup> will communicate with a source of pressure and the pipes 13<sup>a</sup> and 15<sup>a</sup> with the cylinders in which the pressure is to be used.

Upon the shaft 8 are mounted sets of timing cams 16 corresponding in number to the number of valves, and these cams bear against the rollers 11<sup>a</sup> which are held there- by springs 17 bearing against the valves 10. Each cam 16 has a variable face, and is splined on the shaft 8 so that it rotates therewith but may be shifted laterally to bring any portion of the face in contact with the appropriate roller 11<sup>a</sup>.

To shift the cam, it is inclosed by a yoke 18 which has a stem 19 which extends through a slot 20 in the wall of the casing, and this stem carries a spring pin 21 which engages in any one of a series of holes 22. By withdrawing the pin the yoke may be shifted sidewise carrying with it the cam. I have shown three positions to correspond to the three faces *a*, *b* and *c* of each cam, but of course this number may be varied according to the demands of the particular machine which the valve mechanism will control. The cams are individually adjustable so that not only can the operation of each valve be varied, but also the relation of the valve movements with respect to each other.

In the form shown, when any cam 16 lifts a valve 10, as shown in Fig. 2, the flow will be through the port 14, passage 12 and port 13, and when the cam is inactive the spring 17 will reverse the valve and change the flow from the port 14 to the port 15. The profiles of the various cams are capable of any desired variations, which will result in a corresponding variation of the mechanism controlled thereby. The valve elements are also capable of modification. I show a three-way valve but of course the operating mechanism could be applied to any form of single or multiple valve capable of controlling the flow of pressure or other fluid according to predetermined conditions. I show outlet ports

from the valve chamber to permit exhaust when the valve is used in connection with an apparatus requiring the exhaust from all confined fluid.

5 I claim:

1. A valve-timing mechanism, comprising a gang of valves adapted to respectively control separate coöperative mechanisms, a shaft, and cams on the shaft operatively  
10 associated with the valves respectively, each cam having a variety of profiles and being individually shiftable on the shaft to register any profile with the corresponding valve  
15 and the mechanism controlled thereby accordingly.

2. The combination with a plurality of

valves with stems arranged in a row, said valves being adapted to respectively control  
separate mechanisms, of a shaft extending 20  
across the ends of the stems, and cams rotating with the shaft and bearing against the stems respectively, each of said cams  
having various profiles and being selectively  
shiftable along the shaft to bring any pro- 25  
file into active position and thereby varying the operative relation of said mechanisms.

In testimony whereof, I affix my signature in presence of two witnesses.

CARL HENRY RANKIN.

Witnesses:

L. T. GRIFFITH,  
A. L. BRUNN.