

Aug. 8, 1933.

W. T. BARKER, JR

1,921,380

TIMING DEVICE

Original Filed April 13, 1926

*Fig. 1.*

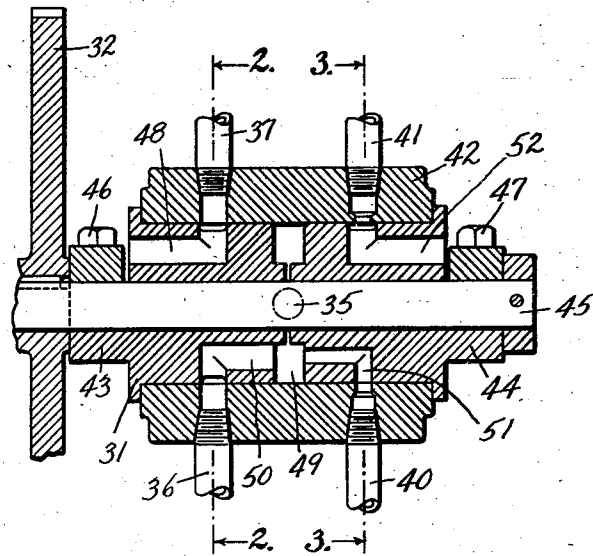


*Fig. 2.*

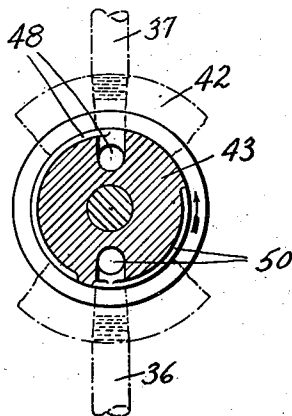
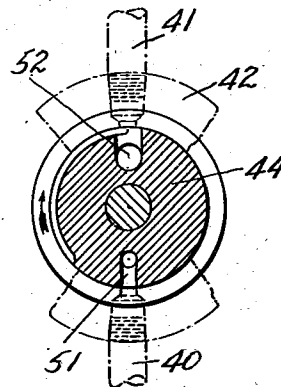


*Fig. 3.*



Witness:

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## UNITED STATES PATENT OFFICE

1,921,380

## TIMING DEVICE

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Original application April 13, 1926, Serial No. 101,663. Divided and this application December 19, 1930. Serial No. 503,545

3 Claims. (Cl. 277-19)

This invention relates to a timing and synchronizing device, particularly adapted for regulating the relative times of application and exhaust of pneumatic pressure to and from pneumatically operated mechanisms, which are to be operated in controlled synchronous relationship.

This application is a division of my copending United States application, Serial No. 101,663, filed April 13, 1926, now Patent No. 1,816,309, issued July 28, 1931. Reference is made thereto for a more detailed showing of one way in which my invention may be utilized.

A particular object of the invention is to provide a timing device of the class mentioned, which readily permits adjustment of the relative timing of the several fluid pressure operated devices and which is simple in construction and positive and efficient in its operation.

Other objects of the invention include such novel features of construction and arrangement of parts as are disclosed in the following specification and drawing, and as set forth in the appended claims.

In the drawing, Figure 1 is a longitudinal view in section showing the details of construction of the timer mechanism;

Figs. 2 and 3 are views in section showing details of the timer structure, the sections being taken on lines 2-2 and 3-3 respectively of Fig. 1.

The timing mechanism 31 controlling the operations of a plurality of mechanisms is of the rotary valve type and comprises a cylindrical casing member 42 provided with apertures adapted to connect with the several fluid conduits 36, 37, 40 and 41, as shown in Fig. 1. The rotary valve member includes separate rotor sections 43 and 44 which are secured to a common shaft 45 by any suitable means, as for example by clamping screws 46 and 47 respectively. The shaft 45 is rotated by the driving gear 32, which is connected directly preferably to a driving gear on a machine with which it is desired to time the mechanisms actuated by air passing through the pipes 36, 37, 40 and 41.

Referring to the details of construction shown in the drawing, the two rotor sections 43 and 44 are separate and form an annular inlet 49 which receives motive fluid from the source of supply through an opening 35, and distributes the same to a portion disposed in the circumference of the rotor sections. The rotor section 43 is provided with a port 50 which is shown as a hole terminating in a groove on the circumference of the

rotor section and this port is shown in position to admit fluid to the conduit 36. While the port 50 is thus admitting fluid to the pipe 36, a similarly constructed port 48 in rotor section 43 is in exhaust position to relieve pressure in conduit 37. The relation of the ports 48 and 50 is shown in Fig. 2. Simultaneously with this operation, the ports in rotor section 44 for controlling the operation of other mechanism are being operated. As shown, port 51 is shown in position to admit fluid to conduit 40, and port 52 is in position to exhaust fluid from conduit 41. The relative positions of these circumferential ports are shown in Fig. 3.

The conduits 36, 37, 40 and 41 may each lead to separate fluid pressure actuated mechanisms, such for example as trip-off valves or air motors. When so connected, it will be obvious that the mechanisms controlled by air admitted to the conduits 36 and 37 will always be moved in a predetermined time relationship to each other, and similarly that the mechanisms actuated by the passage of air through the pipes 40 and 41 will always act in timed relationship to each other. It will also be obvious that by varying the position of the rotor members 43 and 44 on the shaft 45, the time of actuation of each pair of mechanisms controlled by the separate rotors 43 and 44 may be varied relative to the mechanism driving the gear 32 and to each other. A plurality of members 43 and 44 may be provided with circumferential grooves 48, 50, 51 and 52 of varying lengths, and it will be obvious that these may be readily substituted on the shaft 45 for one another.

The pipes 36 and 37 may be connected to opposite ends of a single air cylinder, and the pipes 40 and 41 similarly connected to a second air cylinder. Thus each rotor section will control one mechanism, the movement of which may be varied relative to the other and to the mechanism driving the gear 32.

Variations in the construction and arrangement of parts may be made within the scope of my invention as embodied in the above-illustrated specification thereof, which is made for the purpose of illustration only without departing from the scope of the appended claims.

I claim as my invention:

1. A synchronizing device comprising a continuously rotating shaft, a two-way valve adjustably mounted on the shaft for controlling the admission and exhaust of fluid to and from a fluid motor, another two-way valve adjustably mounted on the shaft for controlling the admission and exhaust of fluid to and from a second

fluid motor, and means for adjusting the valves to time the movements of said motors relative to each other.

2. A device for synchronizing the timing of an apparatus to the timing of two fluid pressure motors, comprising a shaft adapted to be driven in synchronism with said apparatus, a rotary two-way valve mounted on said shaft for controlling the admission and exhaust of fluid to and from one of said fluid pressure motors, another rotary two-way valve for controlling the admission and exhaust of fluid to and from the second of said fluid pressure motors, said valves having a common inlet for operating fluid, and means for manually adjusting the valves to synchronize the

movement of said apparatus with the movements of said motors.

3. A timer mechanism comprising a casing having two series of circumferentially spaced ports, a rotary shaft located in and concentric with said casing, and a pair of valves secured to said shaft within said casing and each adapted during a complete rotation of said shaft to connect each port of a series with a source of pressure fluid supply and with the atmosphere at different times, at least one of said valves being independently adjustable angularly about the axis of the shaft.

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|----|-----|
| 20 | 95  |
| 25 | 100 |
| 30 | 105 |
| 35 | 110 |
| 40 | 115 |
| 45 | 120 |
| 50 | 125 |
| 55 | 130 |
| 60 | 135 |
| 65 | 140 |
| 70 | 145 |
| 75 | 150 |