

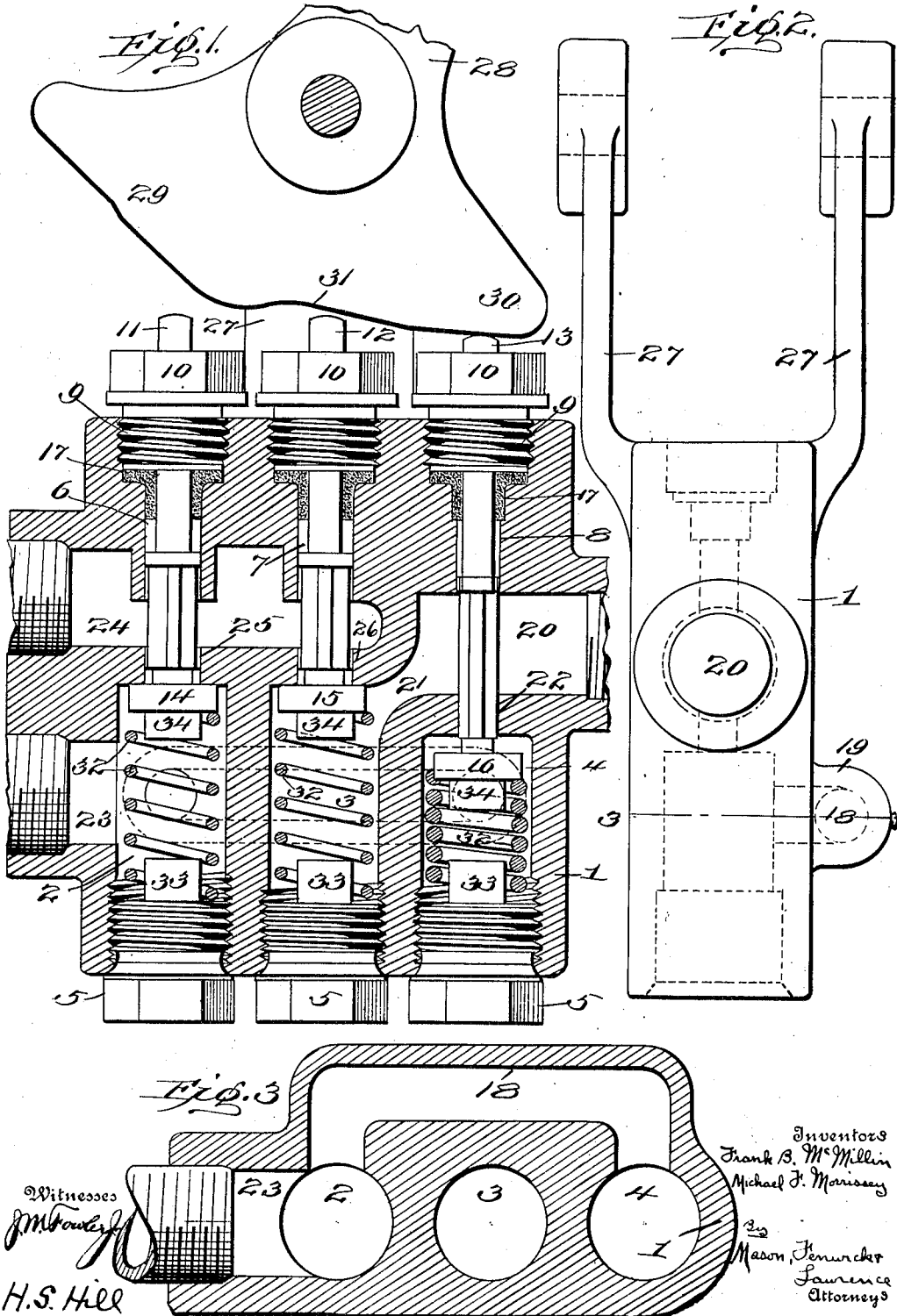
No. 856,655.

PATENTED JUNE 11, 1907.

F. B. McMILLIN & M. F. MORRISSEY.
VALVE.

APPLICATION FILED DEC. 19, 1906.

3 SHEETS—SHEET 1.



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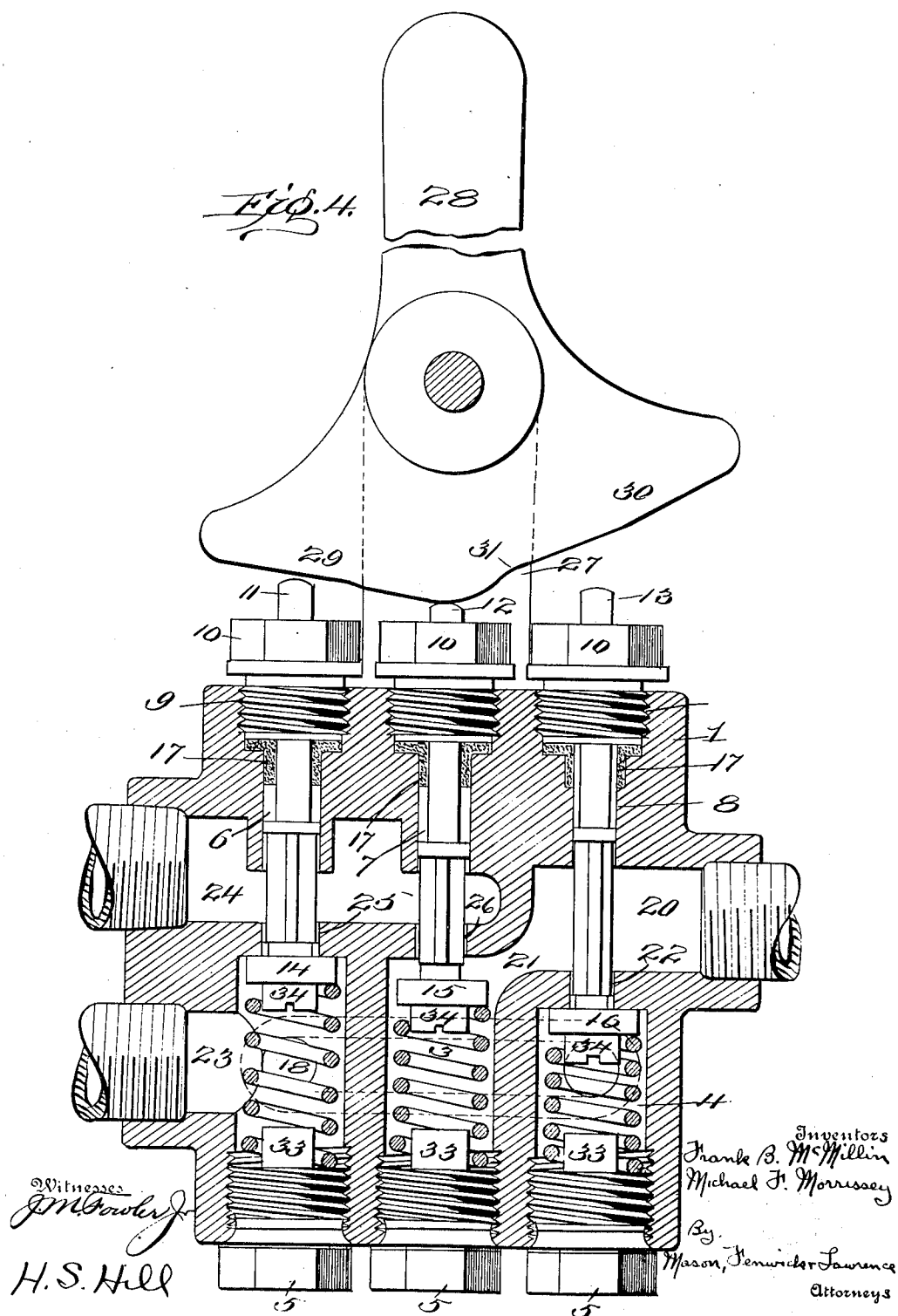
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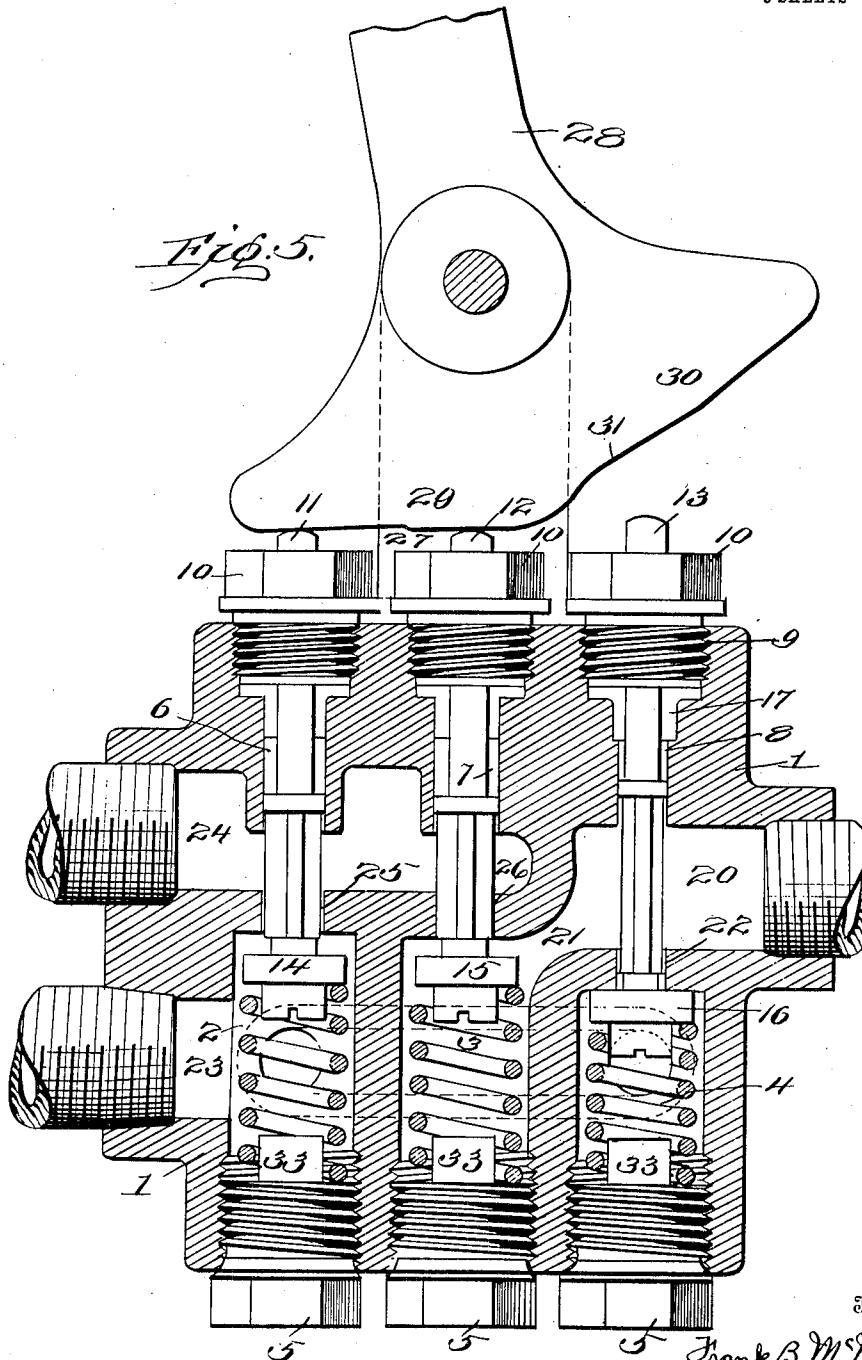
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UNITED STATES PATENT OFFICE.

FRANK B. McMILLIN AND MICHAEL F. MORRISSEY, OF MOUNT
GILEAD, OHIO.

VALVE.

No. 856,655.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed December 19, 1906. Serial No. 348,652.

To all whom it may concern:

Be it known that we, FRANK B. McMILLIN and MICHAEL F. MORRISSEY, citizens of United States of America, residing at Mount Gilead, in the county of Morrow and State of Ohio, have invented certain new and useful Improvements in Valves; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in the construction of valves, and more particularly to that type of valves which are especially designed for use in connection with hydraulic machinery.

One of the objects of the invention is to provide a valve by means of which the supply of the fluid to the cylinder can be regulated without influencing the flow of the fluid through the pressure or supply pipe.

A further object of the invention is to provide a valve that can be quickly operated, has a positive action, and comprises few and simple parts which are peculiarly arranged so as to enable ready access to be had thereto for cleaning or repairing purposes.

With these and other objects in view, the invention comprises certain novel constructions, combinations and arrangements of parts as will be hereinafter more fully described and claimed.

In the accompanying drawings:—Figure 1 is a vertical, longitudinal, sectional view through a valve constructed in accordance with the invention, the various parts being in the position assumed when fluid pressure is being transmitted to the cylinder. Fig. 2 is an end elevation of the valve casing. Fig. 3 is a horizontal, sectional view through the valve casing on the line 3—3 of Fig. 2. Fig. 4 is a vertical, longitudinal, sectional view through the valve showing the mechanism in the position assumed when the pressure is being maintained in the cylinder. Fig. 5 is a similar view showing the parts in the position assumed when the pressure is being released from the cylinder.

The numeral 1 designates the valve casing which is provided with a plurality of valve chambers 2, 3 and 4. In the present instance these valve chambers are shown as opening upon the lower side of the valve casing 1, and as having a parallel relation to each other.

Removable plugs 5 are employed to close the open ends of the valve chambers, and it will be readily apparent that when these plugs are removed free access can be had to the valve chambers for cleaning and repairing purposes. Extending through the valve casing 1 from the top or opposite side thereof are a plurality of openings 6, 7 and 8 corresponding to the valve chambers and communicating with the inner ends thereof. The outer portions of these openings 6, 7 and 8 are enlarged and threaded as indicated at 9 for the reception of the nuts or collars 10 through which the valve stems 11, 12 and 13 pass. The inner ends of these valve stems extend within the valve chambers and carry the valves 14, 15 and 16. Owing to the sliding action of the valve stems 11, 12 and 13, the outer extremities of which project beyond the casing 1, it will be apparent that the action of the valves can be controlled by external means. It may also be mentioned that packing 17 is placed around the valve stems and held in position by means of the nuts 10 so as to prevent any leakage.

The two end valve chambers 2 and 4 are shown as connected by means of the bypass 18 which may be formed in a lateral enlargement 19 upon one side of the casing 1 as shown in the drawings. An inlet port 20 is formed in connection with the valve casing and in the present instance has a transverse direction with respect to the valve chambers 2, 3 and 4 and extends across the inner end of the valve chamber 4. Communication is established between the valve chamber 3 and the inlet port 20 by means of the passage 21 at one side of the chamber 3, and in a similar manner communication between the valve chamber 4 and the inlet is established by means of the passage 22 which enters the valve chamber at the inner end thereof. The casing is also formed upon the opposite side thereof with the two outlet ports 23 and 24, the former of which communicates directly with the valve chamber 2 and leads to the hydraulic cylinder or other machinery to be operated. The outlet 24 extends transversely across the inner ends of the valve chambers 2 and 3 and communicates with the said chambers by means of the openings 25 and 26 respectively, the said openings being controlled by the valves 14 and 15.

Formed upon the upper portion of the cas-

ing are a pair of oppositely disposed arms 27 between which is mounted the operating lever 28. The inner end of the said operating lever is formed with a cam surface adapted to co-operate with the outer ends of the valve stems 11, 12 and 13 to control the valves 14, 15 and 16 and the distribution of the fluid pressure. In the specific formation of the cam surface it will be observed that the same comprises two oppositely inclined portions 29 and 30, the latter having a depressed portion 31. In order to hold the valves normally in a closed position spring members 32 are employed which are interposed between the valves and the plugs 5. In the present instance helical springs are employed and projections 33 are formed upon the plugs 5 and co-operate with similar projections 34 upon the valves to hold the springs normally in operative position.

When the operating lever 28 is thrown in the position shown in Fig. 1 so as to utilize the portion 30 of the cam surface it will be observed that the depressed portion 31 is located over the outer end of the stem 12 and does not unseat the valve 15, while the valve stem 13 is pressed inwardly to open the valve 16 and cause the fluid to pass through the inlet port 20 and opening 22 into the valve chamber 4. When the lever is in this position, it will be readily apparent that owing to the fact that the valves 14 and 15 are closed the fluid will pass through bypass 18 and thence through the chamber 2 and outlet port 23 to the hydraulic cylinder or other machinery being operated. Should it be desired to maintain the pressure in the cylinder without interfering with the flow of the fluid through the pressure or inlet pipe, this result can be accomplished by throwing the operating lever 28 into the position shown in Fig. 4 where the central portion of the cam surface operates upon the valve stem 12 to open the valve 15, while the springs 32 causes the valves 14 and 16 to assume a closed position. When the valve parts are in this position it will be apparent that the fluid entering the inlet 20 passes directly away from the valve casing through the chamber 21, opening 26, and outlet 24, while the pressure within the cylinder is maintained owing to the fact that backward flow of the fluid is prevented by the closed valves 14 and 16. In this connection it may be mentioned that the valve 16 closes a short time before the valve 15 is opened. As otherwise there would a return of fluid from the press cylinder and a corresponding reduction of pressure therein, and also a water hammer when the valve 16 was seated. By throwing the operating lever into the position shown in Fig. 5 the portion 29 thereof is caused to depress the valve stems 11 and 12 and open the valves 14 and 15, the valve 16 assuming a closed position. This permits a direct passage of the fluid

through the valve casing from the inlet 20 to the outlet 24 owing to the fact that the valve 15 is open, and also enables the fluid within the hydraulic cylinder to pass outwardly through the opening 25 and outlet 24 owing to the fact that the valve 14 is opened. It will thus be apparent that the various valves can be readily controlled through the medium of the operating lever in such a manner as to apply pressure to the press cylinder, to hold the pressure in the press cylinder, or to release the pressure from the press cylinder without interfering with the flow of the fluid through the pressure pipe. This feature is particularly advantageous where the pressure is produced by a pump, since it practically eliminates all back pressure and prevents water hammer, thereby greatly prolonging the life of the mechanism.

Should it be found desirable to employ the valve in connection with an accumulator system, all of the operations are the same as previously described except that the central valve 15 should be omitted and its seat made solid so as not to allow any fluid to escape from the accumulator in holding the pressure and in releasing the pressure.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent:—

1. The combination of a valve casing provided with a plurality of valve chambers, the said casing being formed with an inlet communicating with one of the chambers and outlets communicating with the remaining chambers, a valve for each of the chambers, and means for operating the valves whereby the inlet can be placed in communication with any of the outlets.

2. The combination of a valve casing, provided with a plurality of valve chambers, the said casing being formed with an inlet communicating with one of the chambers and outlets communicating with the remaining chambers, a valve within each of the valve chambers, a stem for each valve, and a cam controlling the movements of the valves through the said valve stems.

3. The combination of a valve casing, provided with a plurality of valve chambers, the said casing being formed with an inlet in communication with one of the chambers and an outlet in communication with each of the remaining chambers, a valve for each of the chambers, a valve stem for each of the valves, the said valve stems projecting outwardly beyond the casing, and external means for controlling the action of the valves through the valve stems.

4. The combination of a valve casing, provided with a plurality of valve chambers, the said casing being formed with an inlet communicating with one of the chambers and an outlet communicating with each of the remaining chambers, a valve for each of the

chambers, a valve stem for each of the valves, the said valve stems projecting beyond the casing, and a cam operating upon the valve stems to control the movements of the valves.

5 5. The combination of a valve casing, provided with a plurality of valve chambers opening upon one side of the casing, the said casing being formed with an inlet communicating with one of the chambers and an outlet communicating with each of the remain-
10 ing chambers, removable plugs closing the valve chambers, a valve within each of the valve chambers, and means for controlling the action of the valves whereby the inlet can
15 be thrown into communication with any of the outlets.

6. The combination of a valve casing, provided with an intermediate valve chamber and with a pair of end valve chambers, the
20 said casing being formed with an inlet communicating directly with the intermediate chamber and with one of the end chambers, an outlet communicating directly with the opposite end chamber, a second outlet com-
25 municating with the same valve chamber and also with the intermediate chamber, and

a bypass connecting the end valve chambers, and valve means within the valve chambers.

7. The combination of a valve casing, provided with three valve chambers having a
30 parallel relation to each other, the said casing being formed with an inlet extending transversely across the inner end of one of the end chambers and communicating directly with the intermediate chamber, an
35 outlet passing transversely across the inner ends of the opposite end chamber and the intermediate chamber, a second outlet communicating directly with the opposite end chamber, and a bypass connecting the end cham-
40 bers, passages being formed between the inner ends of the chambers and the inlet or outlet passage extending transversely across the same, and valves operating within the valve
45 chambers.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK B. McMILLIN.

MICHAEL F. MORRISSEY.

Witnesses:

H. L. SCHUMAN,
A. E. WELLBAUM.