

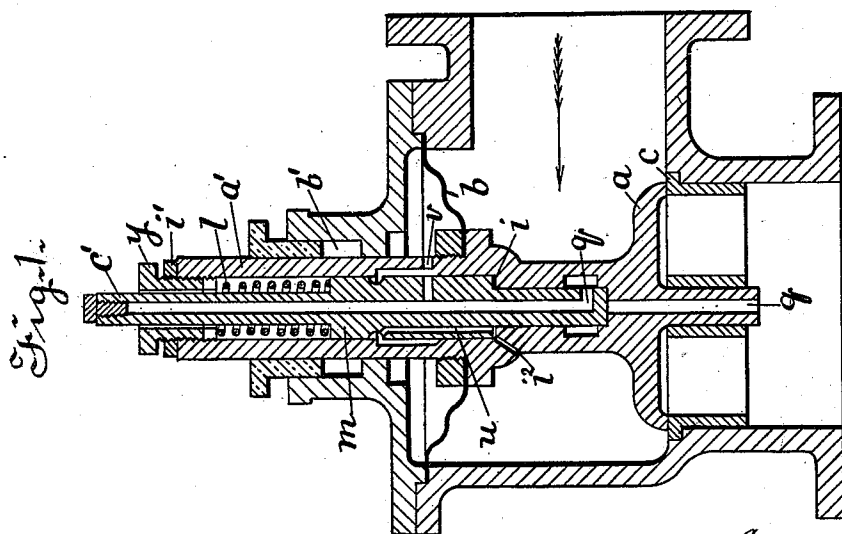
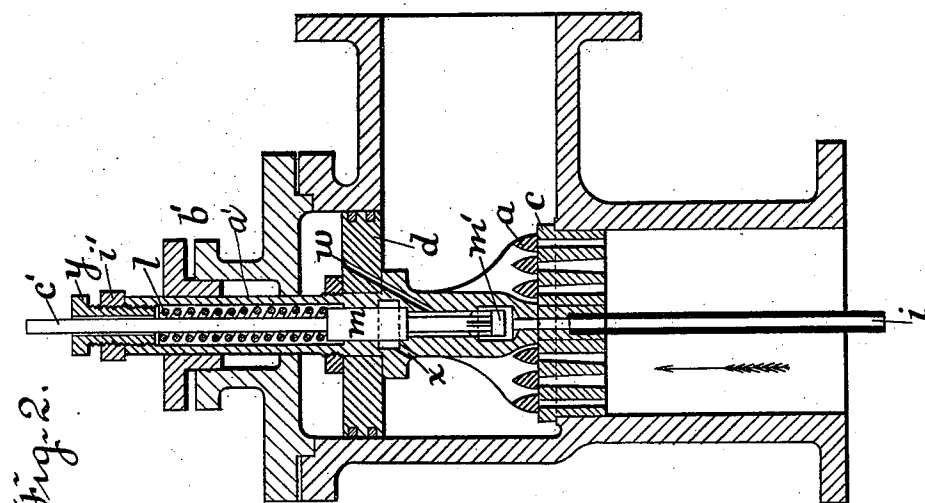
(No Model.)

2 Sheets—Sheet 1.

C. J. MELLIN.
SAFETY VALVE.

No. 534,514.

Patented Feb. 19, 1895.



Witnesses.
W. J. Morgan
J. S. Lockwood.

Inventor.
C. J. Mellin
By A. O. Thayer
att'y

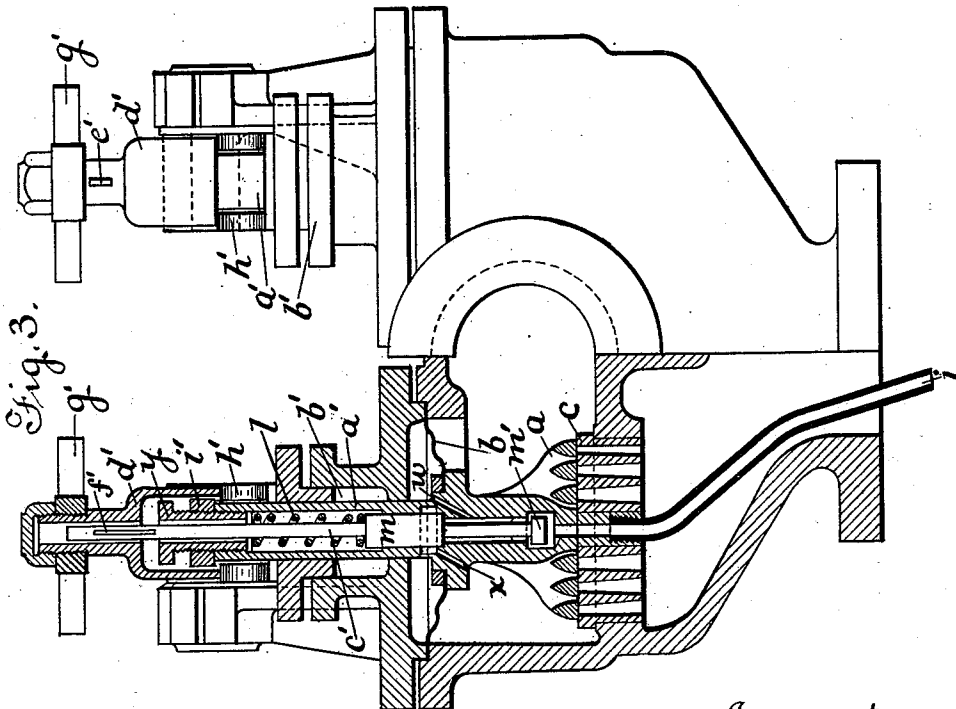
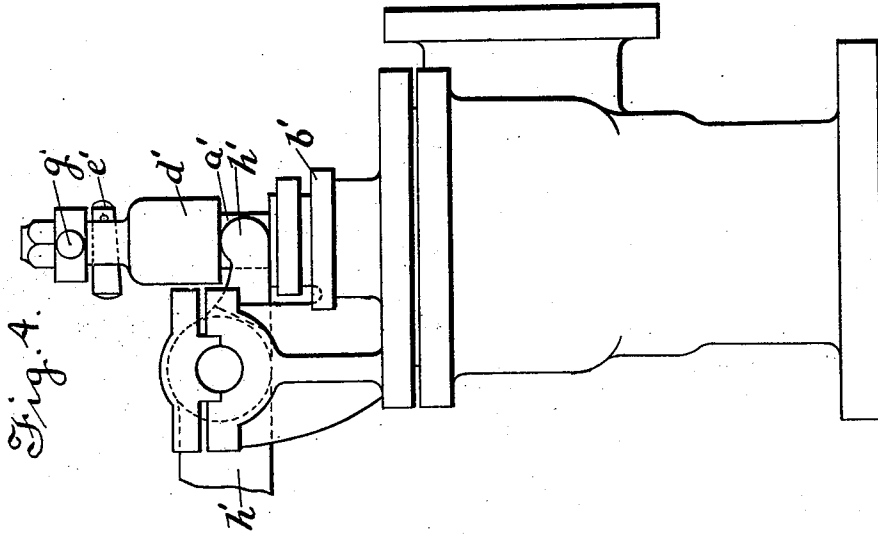
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

CARL J. MELLIN, OF RICHMOND, VIRGINIA.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 534,514, dated February 19, 1895.

Application filed January 23, 1890. Serial No. 337,888. (No model.)

To all whom it may concern:

Be it known that I, CARL J. MELLIN, a subject of the King of Sweden and Norway, and a resident of Richmond, Henrico county, Virginia, have invented new and useful Improvements in Stop, Safety, and other Valves, of which the following is a specification.

My invention consists of improved contrivances whereby the valve is slightly overbalanced and kept closed by the fluid to be controlled, and improved auxiliary valve devices for automatically relieving the overbalancing pressure by increase of pressure of the confined fluid, and also improved lock-up and testing devices for both the auxiliary and main valves, all as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1, is a sectional elevation of my improved valve in a construction in which the valve opens against the confined fluid. Fig. 2, is a similar view of the said valve in a construction by which the valve opens with the outflow of the confined fluid. Fig. 3, is partly a sectional elevation and partly a side view of a duplex valve constructed same as in Fig. 2, and also having the lock-up and testing lever device. Fig. 4, is an elevation of the valve of Fig. 3, as seen from a direction at right angles to the view of Fig. 3.

The valve proper is represented at *a*. It is overbalanced and kept closed by the pressure of the fluid to be controlled by it.

In Figs. 1 and 3 there is a diaphragm *b*, whereon the fluid acts with pressure slightly overbalancing the pressure tending to open the valve and thus keeps it closed on the seat *c*, without much pressure thereon avoiding the injurious effects of excessive pressure of the valve on the seat. The construction of Fig. 1, is that of a silent safety valve discharging into a condenser. In Fig. 2, it is a piston *d*, instead of the diaphragm by which the valve is overbalanced. The overbalancing fluid is admitted to the diaphragm or piston by the passage *i*, extended by a pipe into the locality of quiet and uniform pressure of the steam in Figs. 2 and 3. In Fig. 1 it enters by the shorter passage *i*. A valve thus overbalanced enables a large automatically opening valve to be controlled by an auxiliary valve *m*, and a small light spring *l*, such as is within

practicable size and will be sensitive to act and easy to adjust, whereas the common spring safety valve in which the spring resists the whole opening power of the confined fluid is very difficult to gage within narrow limits, and is variable in action and unreliable.

In Fig. 1 normal pressure on the upper side of valve *a*, and also inside of the diaphragm, 60 to which it enters through passages *i*, *u*, and port *v*, keeps valve *a*, closed but when the pressure rises it raises valve *m*, against the spring by its effect under shoulder *l'*, so as to cut off port *v*, and open the diaphragm to the low pressure side through exhaust passage *g*, 65 so as to exhaust the high pressure from the diaphragm and allow the valve to open by the pressure under the diaphragm and when the pressure falls, above the valve *a*, to such extent that valve *m*, falls by the effect of the spring, the high pressure then enters the diaphragm and the valve *a*, closes.

In Fig. 2 normal high pressure below the valve *a*, keeps it closed by entering through passages *i* and *w*, above piston *d*, which is larger than valve *a*, but increase of the same above the normal raises valve *m*, so as to shut off the high pressure from below by head *m'* and open the space above piston *d*, to the exhaust through passage *x*, when valve *a*, opens and reduces the pressure to the normal condition again. Then the spring *l*, forces valve *m*, down again and again opens the space above piston *d*, to the pressure from below 85 for nearly balancing valve *a*.

In Fig. 3, the arrangement and operation are substantially the same as in Fig. 2, the only difference being in the use of the diaphragm *b*, instead of the piston *d*. 90

The pipes *i* in Figs. 2 and 3 are extended downward a suitable distance to receive the confined fluid from a position where it is more quiet and less liable to be of less pressure than nearer the valve where its rapid 95 movement and broken condition may be such as to render it less effective for actuating the controlling devices. The tension of the spring *l*, is adjusted by the screw plug *y* in the tubular stem *a'*, containing valve *m*, and attached to valve *a*, and extending up through the stuffing box *b'*. The valve *m*, also has a stem *c'*, on which the spring *l*, is arranged and extending up through the plug *y* so that 100

it can be used readily for lifting valve *m*, by hand from time to time to test the working of it and the main valve.

For a lock-up device to prevent tampering
 5 with the adjusting plug *y*, I place the cap *d'*, over it and couple the rod *c'*, with the neck of the cap by the key *e'*, extending through the slot *f'*, of the rod extended far enough
 10 below the key to leave the piston free to rise freely in the performance of its function in connection with the main valve, and to facilitate lifting said valve *m*, for testing purposes I apply the lifting handle *g'*, to the top of the neck of the cap as shown. I employ the usual testing lever *h'*, for testing the
 15 main valve *a*, and so that it may be used to try the auxiliary valve independently of the main valve. I make the cap to extend at the lower end a little lower than the check nut *i'*
 20 used to fasten the adjusting plug *y*, which nut is made to project outward to a greater extent than stem *a'*, so that lever *h'* working under both of these devices will first raise auxiliary valve *m*, sufficiently to test it properly and then being still further raised will
 25 lift main valve *a*, also.

I claim as my invention—

1. The combination with the valve having the tubular stem extending through the cover
 30 of the valve of the overbalancing piston or diaphragm, the auxiliary piston valve and spring located in said valve, said piston valve having a stem extending upward through the plug in the end of the tubular stem of the main valve so as to permit the piston valve
 35 to be lifted by said stem, the inlet passage

normally admitting overbalancing pressure to said piston or diaphragm through said piston valve, and the exhaust passage from said overbalancing piston or diaphragm through
 40 said piston valve, and normally closed thereby, said inlet and exhaust passages and piston valve adapted for closing the former and opening the latter by the abnormal movement of the valve substantially as described.
 45

2. The combination with the overbalanced main valve, and the auxiliary valve and spring controlling the difference of pressure, effecting the opening and closing of the main valve, and with the adjusting nut of said
 50 spring, of the lock-up cup attached to the stem of the auxiliary valve, and covering said nut, the connection being such that the valve is free to rise without obstruction by the cap, while the raising of the cap raises the valve
 55 substantially as described.

3. The testing lever, main valve stem, check nut of the spring adjusting plug, auxiliary valve stem, and lock-up cap combined in the described arrangement whereby the auxiliary
 60 valve is first opened independently of the main valve, and said main valve thereafter opened by said lever substantially as described.

In testimony that I claim the foregoing as
 65 my invention I have signed my name, in presence of two witnesses, this 31st day of December, 1889.

CARL J. MELLIN.

Witnesses:

WILFRED B. EARLL,
 W. J. MORGAN.