

(No Model.)

C. J. MELLIN.

EMERGENCY VALVE DEVICE FOR COMPOUND ENGINES.

No. 589,184.

Patented Aug. 31, 1897.

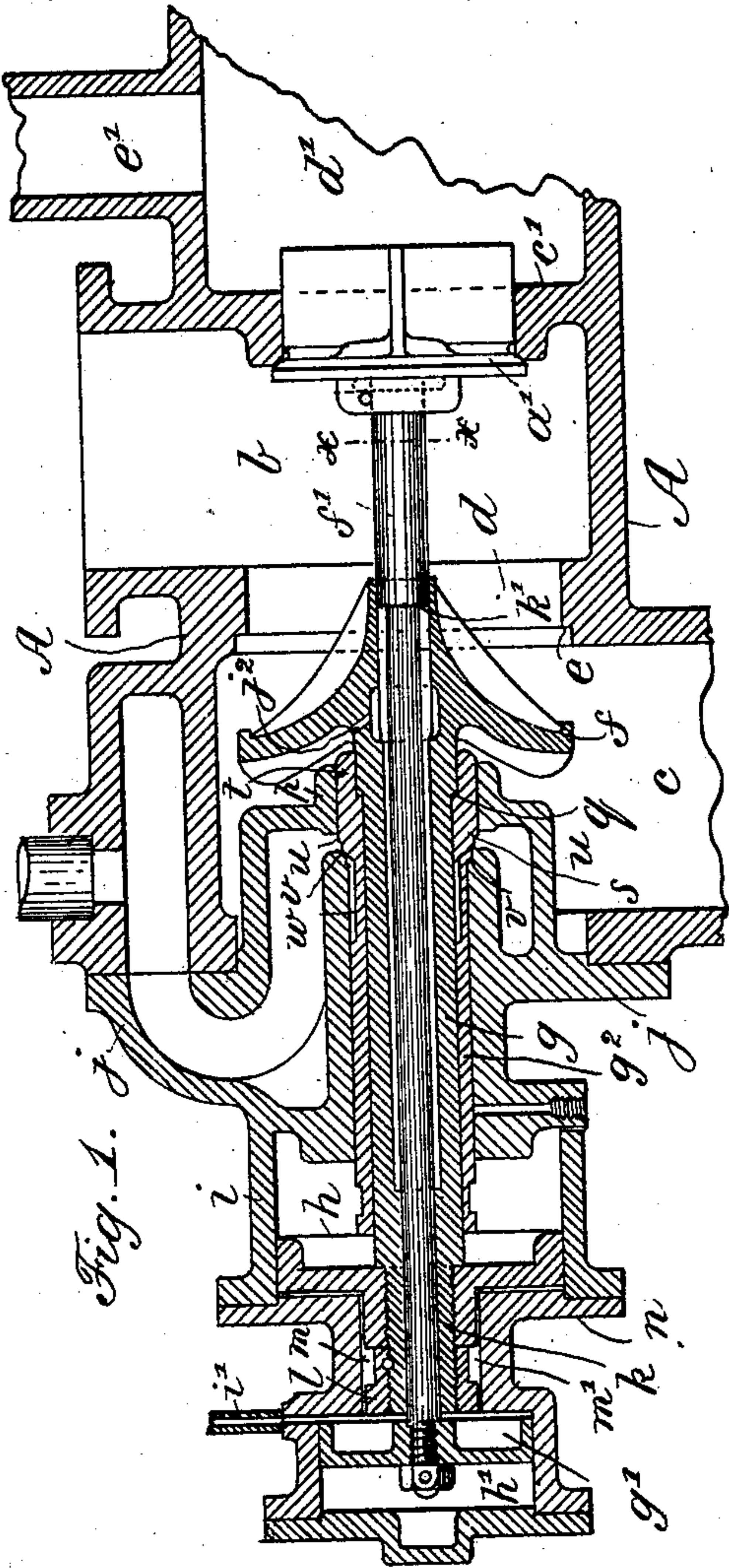


Fig. 1.

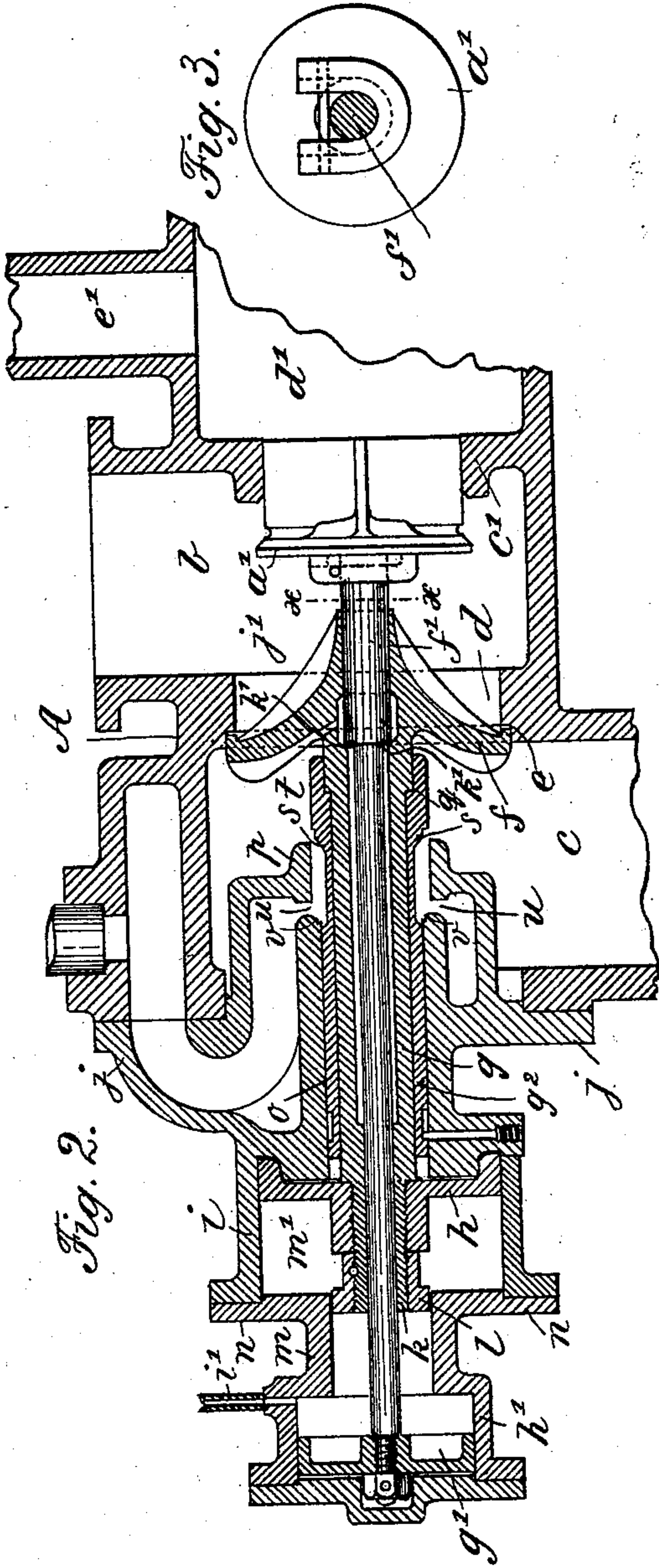


Fig. 2.

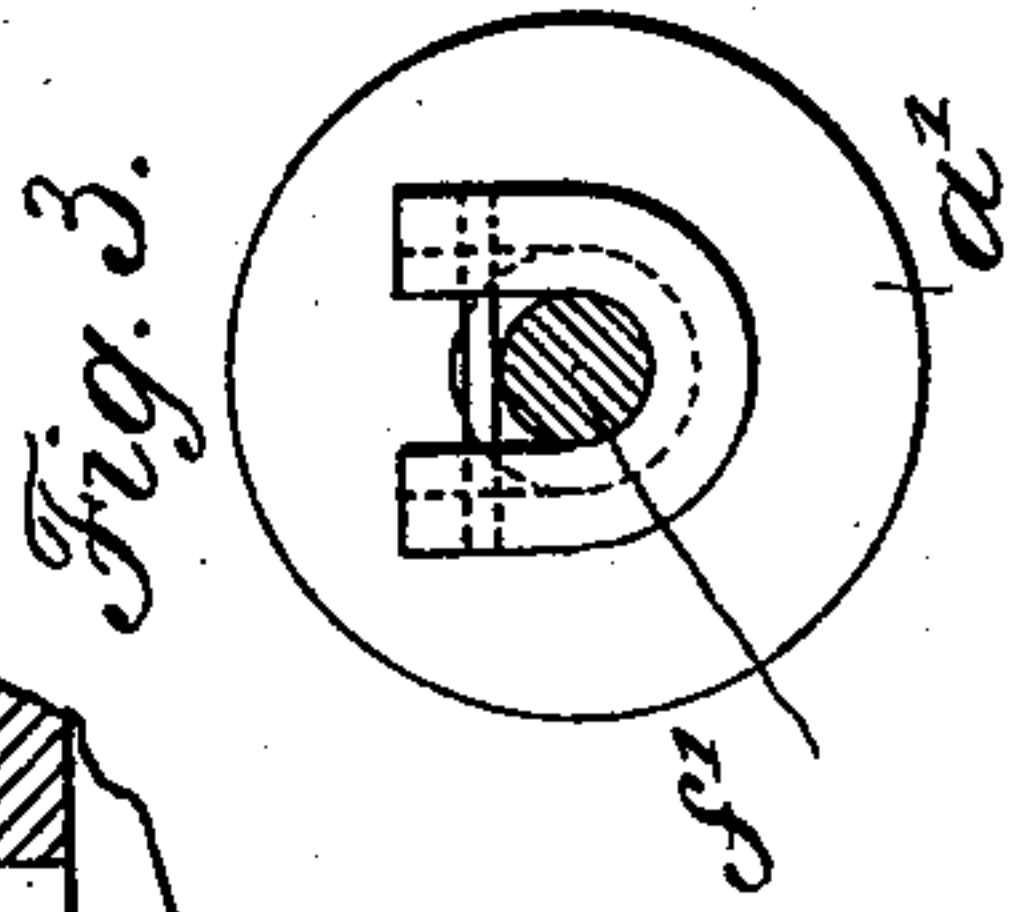


Fig. 3.

WITNESSES.

H. J. Morgan
Henry Cummings

INVENTOR.

Carl J. Mellin
by A. P. Thayer
att'y.

UNITED STATES PATENT OFFICE.

CARL J. MELLIN, OF RICHMOND, VIRGINIA, ASSIGNOR TO THE RICHMOND LOCOMOTIVE AND MACHINE WORKS, OF SAME PLACE.

EMERGENCY-VALVE DEVICE FOR COMPOUND ENGINES.

SPECIFICATION forming part of Letters Patent No. 589,184, dated August 31, 1897.

Application filed December 12, 1895. Serial No. 571,859. (No model.)

To all whom it may concern:

Be it known that I, CARL J. MELLIN, a citizen of the United States, and a resident of Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Intercepting and Emergency Valve Devices for Compound Engines, of which the following is a specification.

10 My invention consists in a construction whereby the force employed to open the emergency-valve is utilized also for closing the intercepting-valve in a way to insure more prompt and certain action of the intercepting-valve and the live steam admitted to the low-pressure cylinder is made to close the emergency-valve earlier than it can be closed by the high-pressure exhaust, as hereinafter fully described, reference being made to the
20 accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation of my improved valve apparatus, the intercepting-valve being open and the emergency-valve closed, as in normal compound operation of the engine; and Fig. 2 is a similar section with the intercepting-valve closed and the emergency-valve open, as when working live steam direct in both cylinders. Fig. 3 is a detail in section on line *x x*, Figs. 1 and 2.

30 A represents the valve-case, in which is the receiving-chamber *b* for the exhaust-steam from the high-pressure cylinder and the delivery-chamber *c* for said steam to the low-pressure cylinder, between which chamber is the communicating passage *d*, with the surrounding seat *e*, to which the intercepting-valve *f* is fitted for closing said passage when live steam is to be used directly in the low-
40 pressure cylinder.

The valve *f* is fitted to a hollow stem *g*, to which the piston *h* is attached, in the dash-pot case *i* on the cover *j* of one end of the valve-case A, and on an extension *k* of said stem, beyond piston *h*, is another piston *l*, working in a cylinder *m*, formed in an extension of the cover *n* of the dash-pot *i*, said piston being screwed on the rod and forming a check-nut to the piston *h*, which is also

screwed on. The notches *m'* are to make flat 50 faces for the application of a wrench for screwing the piston.

A sleeve *g*² is fitted on the rod *g* and within a cylinder *p* for a valve to control the admission of the live steam for direct action in the low-pressure cylinder and for a means of closing the intercepting-valve preparatory to such direct action. The said sleeve takes effect on the valve by the shoulder at *q*, and it is impelled by the action of the live steam 60 on the shoulder *s* of its head *t*, the steam being admitted at the port *u*, which is always open for admission of the steam when the throttle-valve is open. In closing the intercepting-valve the shoulder *s* of piston-head *t* 65 passes out of the end of cylinder *p* to open for admission of the steam, the arrangement being such that the edge of valve *f* enters the recess of seat *e* slightly before the said opening takes place to prevent escape of steam so 70 admitted past said valve *f*.

When the intercepting-valve opens and shoulder *s* of head *t* is forced back within cylinder *p*, live steam is shut off just before valve *f* escapes from the recess of valve-seat 75 *e*. The limit of the opening of valve *f* is determined by a shoulder *v* in the cylinder *p*, back of port *u*, where the bore is reduced for overbalancing effect of steam on shoulder *s* and for a seat for said shoulder *s* to so limit 80 the opening.

The neck *w* of the sleeve or admission-valve is proportioned in size to the size of the larger part of the cylinder *p*, which it occupies when open to limit the amount of steam 85 admitted, so that pressure will not rise too high in the low-pressure cylinder, and so that when the movement of the engine increases sufficiently for changing to compound action the pressure of the live steam in the low- 90 pressure cylinder will fall to a degree that will be overbalanced by the pressure of exhaust-steam in chamber *b* from the high-pressure cylinder which will automatically open the intercepting-valve and cause re- 95 sumption of normal action.

As thus far described the apparatus is substantially same as is now in use, and emer-

gency-valves have also been used in various arrangements together with them for enabling continued use of live steam for a longer time and for changing from compound to direct action while running, and I do not claim such apparatus broadly.

The emergency-valve is represented at *a'* opposite to the intercepting-valve *f* and in line with it axially. It opens communication from chamber *b* through wall *c'* into chamber *d'*, from which there is free exhaust by the passage *e'*. The stem *f'* of this valve extends entirely through the hollow stem *g* of the intercepting-valve and has a piston *g'* attached to its extremity in a cylinder *h'* in the cover of cylinder *m*. Steam or other pressure is admitted through pipe *i'* to cylinder *h'* between pistons *l* and *g'* when at the will of the engineer the emergency-valve is to be opened. It acts on both pistons and thus sets the intercepting-valve in motion for closing at the same time that it opens the emergency-valve and effects the change from compound to direct action more promptly.

The hollow stem *g* of the intercepting-valve has a port *j'*, which admits live steam into the bore of said stem when live steam enters the low-pressure side at starting, and stem *f* of the emergency-valve has a shoulder *k'* in said bore whereon such steam acts, so as to close the emergency-valve before the exhaust comes from the high-pressure side, and thus effects earlier closing and saves some waste of steam.

I claim as my invention—

1. The combination in a compound engine, of the intercepting-valve having a hollow stem, emergency-valve having its stem extended through the hollow stem of the intercepting-valve, casings for, and passages controlled by said valves, a piston attached to each stem respectively, a cylinder for said pistons and an admission-port intermediately of said pistons for a motive fluid substantially as described.

2. The combination in a compound engine, of the intercepting-valve, emergency-valve casings for, and passages controlled by said valves, and means whereby live steam admitted to the low-pressure cylinder, also takes effect on the emergency-valve for closing it prior to the action of the high-pressure ex-

haust on said emergency-valve substantially as described.

3. The combination in a compound engine, of the intercepting-valve, emergency-valve casings for, and passages controlled by said valves, the bored stem of the intercepting-valve, and shouldered stem of the emergency-valve said stem of the emergency-valve subject to live steam admitted to the low-pressure cylinder for closing said emergency-valve prior to the action of the high-pressure exhaust on said emergency-valve substantially as described.

4. The combination in a compound engine, of the intercepting-valve, emergency-valve casings for and passages controlled by said valves, bored stem of the intercepting-valve, stem of the emergency-valve extending through the stem of the intercepting-valve, piston on the extremity of the intercepting-valve stem, piston on the stem of the emergency-valve, cylinder for said pistons and the motor-fluid-admission port intermediately of said pistons substantially as described.

5. The combination in a compound engine, of the intercepting-valve, emergency-valve casings for, and passages controlled by said valves, stem of the emergency-valve extending through the stem of the intercepting-valve, dash-pot for the intercepting-valve, piston on the extremity of the intercepting-valve stem, piston on the extremity of the emergency-valve, cylinder for said pistons, and the motor-fluid-admission port intermediate of said pistons substantially as described.

6. The combination of an intercepting-valve normally held open by the exhaust-steam from the high-pressure cylinder and provided with means for closing it in the absence of said exhaust-steam, an exhaust-valve for relieving said intercepting-valve of said exhaust-steam, and an air dash-pot located in the head of the casing of the intercepting-valve substantially as described.

Signed at New York city, in the county and State of New York, this 26th day of October, A. D. 1895.

CARL J. MELLIN.

Witnesses:

W. J. MORGAN,
A. P. THAYER.