

A. Kipp, Jr.,
Blast Regulator,

No. 43,856,

Patented Aug. 16, 1864.

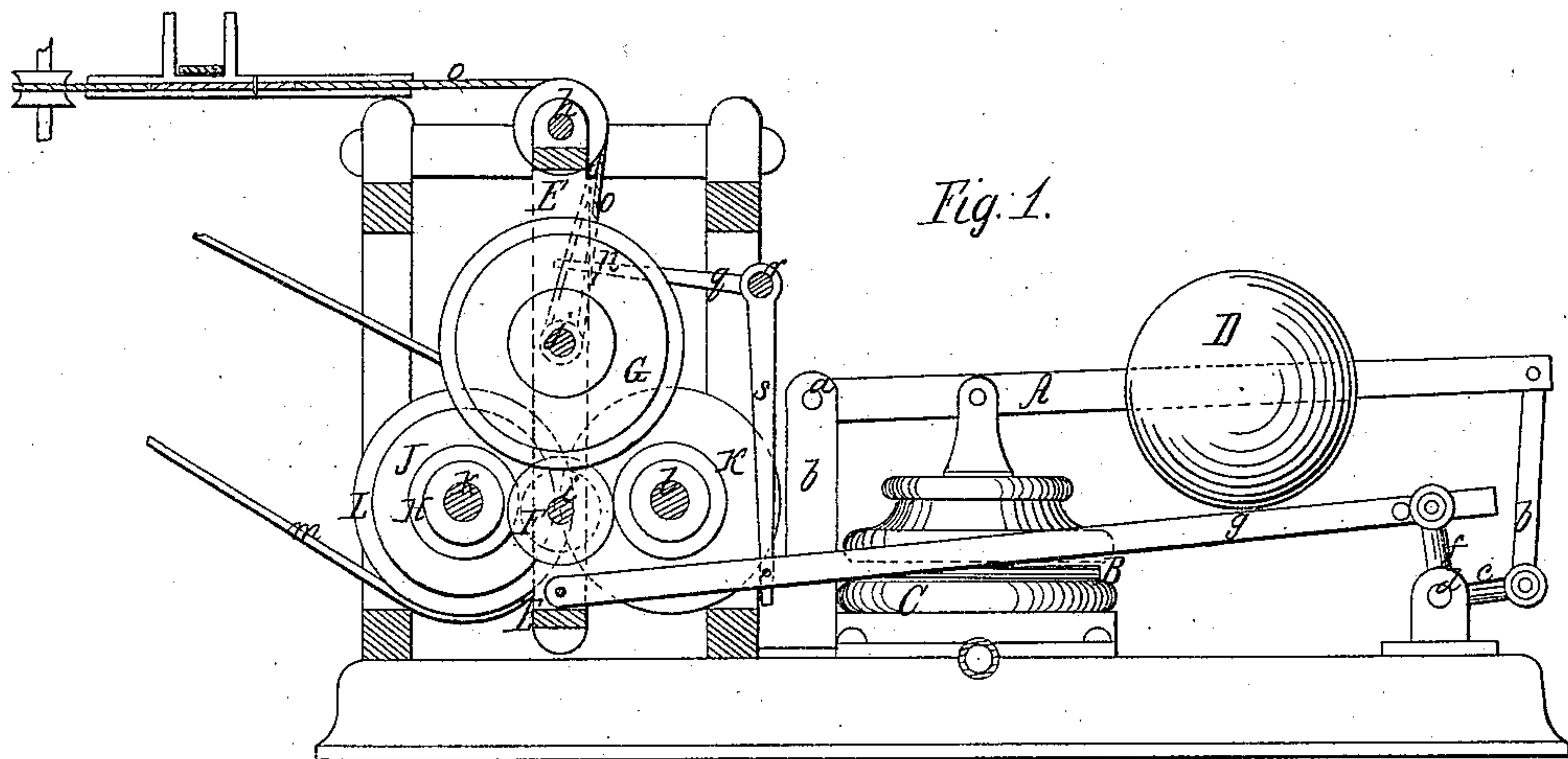
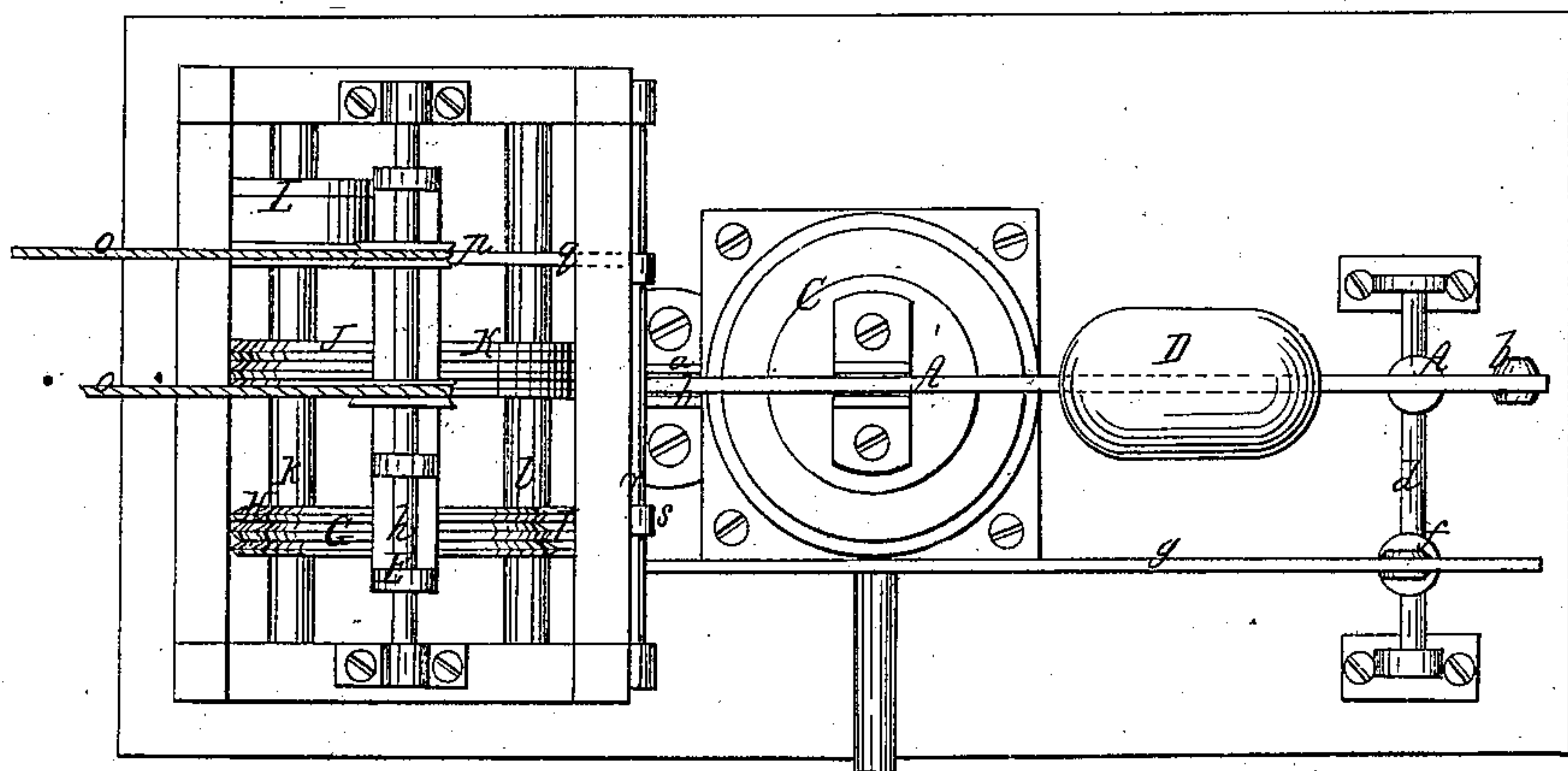


Fig. 1.

Fig. 2.



Witnesses;
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UNITED STATES PATENT OFFICE.

ABRAHAM KIPP, JR., OF SING SING, NEW YORK.

IMPROVED BLAST-REGULATOR.

Specification forming part of Letters Patent No. 43,856, dated August 16, 1864.

To all whom it may concern.

Be it known that I, ABRAHAM KIPP, Jr., of Sing Sing, in the county of Westchester and State of New York, have invented a new and Improved Blast-Regulator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal vertical section of this invention. Fig. 2 is a plan or top view of the same.

Similar letters of reference indicate like parts.

The object of this invention is to control the position of the belt which imparts motion to the fan-blower or other blast-machine of a steam-boiler furnace by the pressure of the steam, so that when the steam rises, and the pressure reaches a certain point, said belt will be thrown off and the motion of the blast-machine stopped, and when the steam goes down the belt will gradually be put on and the blast-machine started.

The invention consists in combining a lever or rod, the position of which is governed by the opposing action of the weight or spring in one end, and of the steam in the opposite direction, with suitable shafts and a train of wheels or their equivalents, and with the belt-shipper which controls the position of the driving-belt of the blast-machine in such a manner that, according to the higher or lower position of said lever or rod, the position of the wheels is changed and the belt-shipper is moved in one direction or in the other, causing the driving-belt to be put on when the steam goes down, and taken off when the steam rises.

A represents a lever, which has its fulcrum on a pivot, *a*, in a standard, *b*, and is supported by a flexible diaphragm, *B*, secured in a suitable box or case, *C*, and exposed from the inside to the pressure of the steam of a steam-boiler. A slip-weight, *D*, which is adjustable on the lever *A*, has a tendency to depress the same, and the diaphragm and the position of the lever is thus controlled by the action of the steam and that of the weight on the diaphragm. It is obvious, however, that instead of the weight a spring might be attached to the lever *A*, and said lever might be replaced

by a rod placed in a vertical or any other desirable position, and exposed to the action of the steam in the one and that of the weight or spring in the opposite direction; and I do not wish to confine myself, therefore, to the precise arrangement of parts shown in the drawings.

The loose end of the lever *A* connects by a link, *b*, with an arm, *c*, extending from a rock-shaft, *d*, and another arm, *f*, which is secured to said rock-shaft, and extends from it in a direction at right angles to the arm *c*, connects by a rod, *g*, with a strap, *E*, which is suspended from a shaft, *h*, as clearly shown in Fig. 1 of the drawing. This strap forms the bearings for the axles *i j* of two friction-wheels, *F G*, which mesh into each other, so that any rotary motion imparted to one will be transmitted to the other.

The wheel or pinion *F* is situated between two shafts, *k l*, which rotate in opposite directions, and which are provided with pinions *H I*, situated in such relation to the pinion *F* in the strap *E* that by pulling said strap in one direction the pinion *F* is thrown in gear with the pinion *I*, and by pulling or pushing said strap in the opposite direction the pinion *F* is thrown in gear with the pinion *H*. The motion of the pinion *F* is thus reversed according to the position of the strap *E*, which is governed by the rock-shaft *d* and lever *A*, or, in reality, by the pressure of the steam.

The shafts *k l* are geared together by two wheels, *J K*, and motion is imparted to the shaft *k* by a belt, *m*, extending round the pulley *L*. By this mechanism the motion of shaft *j*, bearing the wheel *G*, is reversed automatically as the steam rises or falls; and it must be remarked that this mechanism might be changed in various ways without changing the result, and I do not wish to confine myself to the precise mechanism hereinbefore described. This shaft *j* of the wheel *G* connects by a rope or chain, *o*, with the belt-shipper, and the ends of this rope or chain are wound in opposite directions round said shaft, so that by rotating the same in one direction the belt of the blast-machine is thrown off, and by rotating said shaft in the opposite direction said belt is put on.

The manner in which the rope *o* may be arranged and connected to the belt-shipper is indicated in Fig. 1 of the drawings; but it is

obvious that this arrangement has to be changed according to the position of the belt-shipper in relation to the balance of the mechanism, and according to its construction.

By this arrangement I am enabled to control the blast in a steam-boiler furnace automatically and with the greatest nicety. If the steam rises, the belt of the blast-machine is thrown off, and if the steam goes down said belt is put on.

In order to stop the motion of the shaft *k* after the belt has been changed, the rope or chain *o* passes through a loop, *p*, at the end of an arm, *q*, which is firmly connected to a rock-shaft, *r*, and another arm, *s*, extending from said rock-shaft in a downward direction, hooks in a rod, *g*, which connects the rock-shaft *d* with the oscillating strap *E*. If the belt-shipper has reached its extreme position in either direction, the strain of the rope or chain on the loop *p* turns the rock-shaft *r* slightly round, and by the action of the arm *s* on the rod *g* the strap *E* is brought in a central position and the pinion *F* thrown out of gear with the pinions *H I*.

It will be noticed by this arrangement the power necessary to throw the belt of the blast-machine or to cut off the blast is derived entirely from an outside source—viz., the belt *m*, running on the pulley *L*—the action of the steam on the lever or rod *A* being employed merely to produce the change in the

motion of the mechanism employed for throwing the belt.

I am aware that the action of the steam on the diaphragm has been employed to shift the damper by connecting the lever *A* directly to the damper. In this case the steam is relied upon to produce the change in the position of the damper, and no outside power is brought in action, and the action of the device is slow and uncertain.

By my invention I am enabled to change the belt or the cut-off of the blast instantaneously as soon as the steam begins to rise or to go down.

I claim as new and desire to secure by Letters Patent—

Regulating the pressure of steam in a steam-boiler by the employment or use of an outside power transmitted by a suitable medium—such, for instance, as the belt *m*—in combination with the lever *A* or its equivalent, and with the mechanism required to change the motion of the shaft *j*, substantially as herein specified, so that the change in the motion of said shaft is produced by the direct action of the steam, whereas the power requisite to throw the belt or shift the cut-off is derived from an outside source.

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Witnesses:

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