(No Model.)

O. NOLL.

APPARATUS FOR STOPPING STEAM ENGINES.

No. 370,644. Patented Sept. 27, 1887.

Fig. 1.

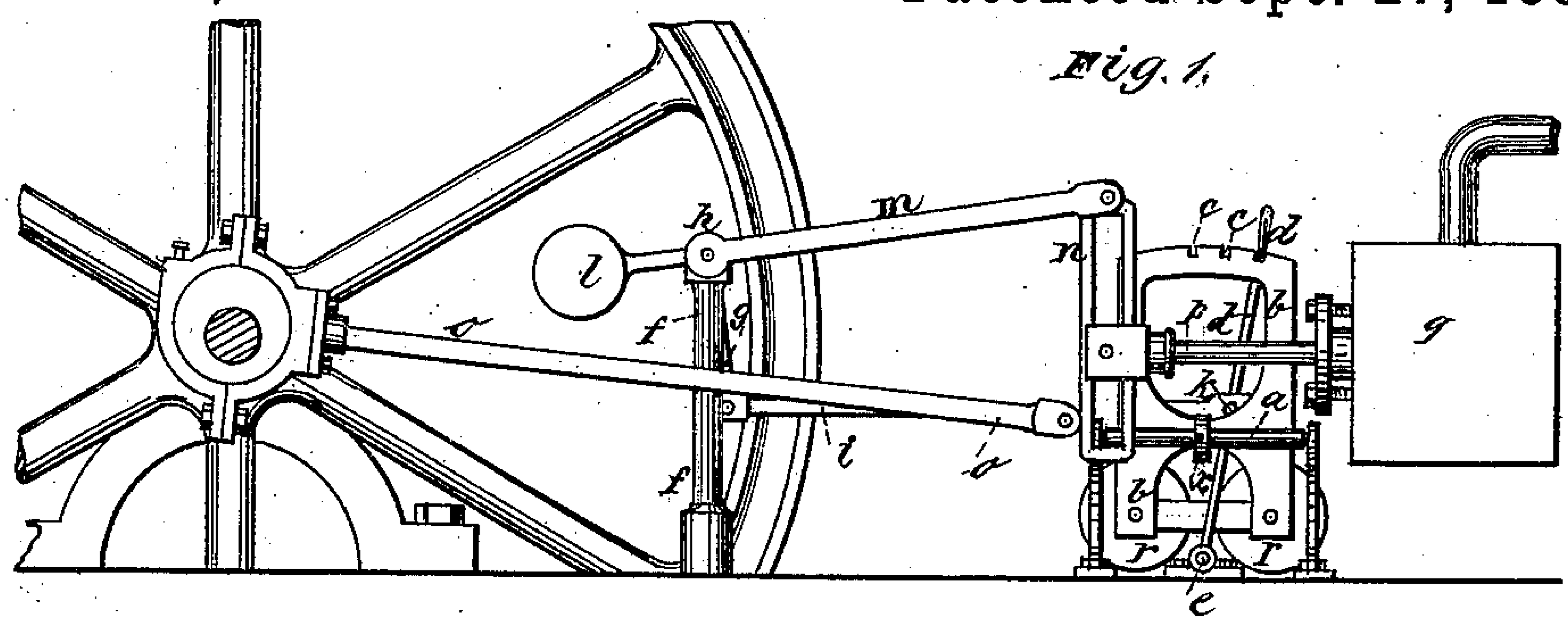


Fig. 2.

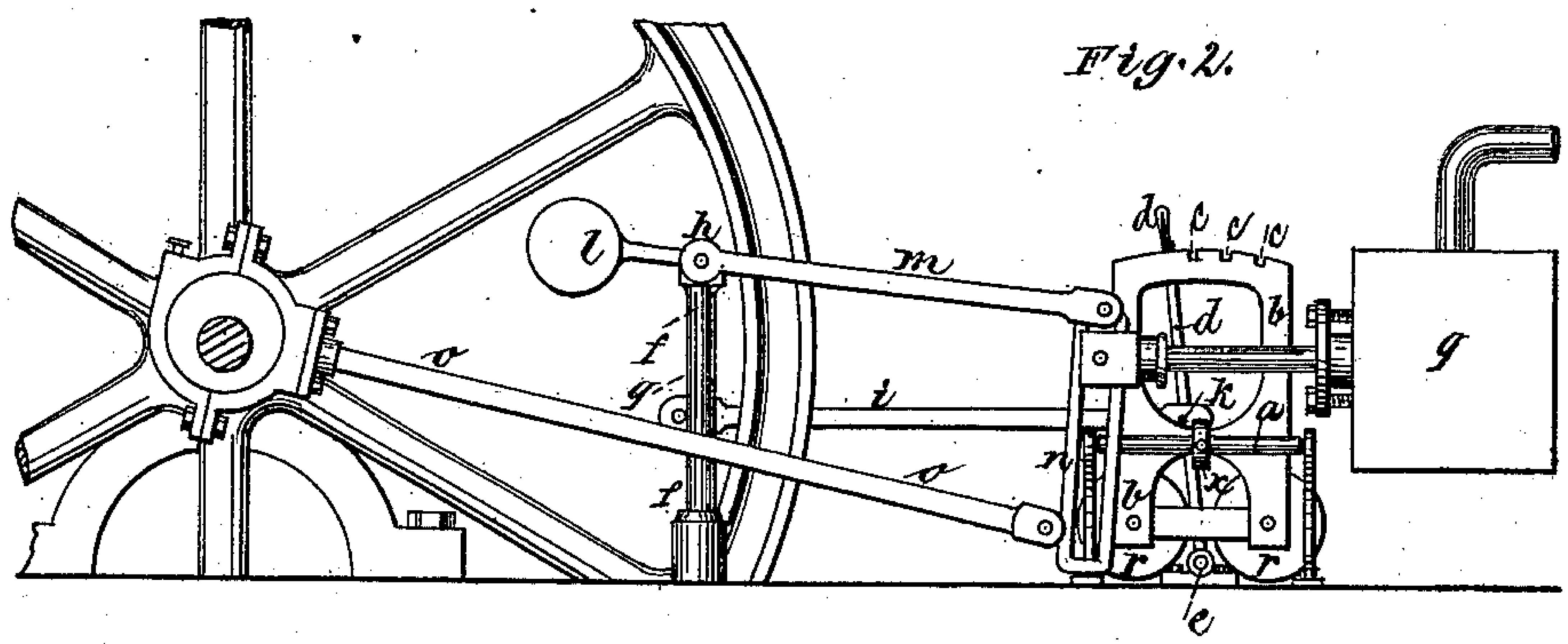


Fig. 3.

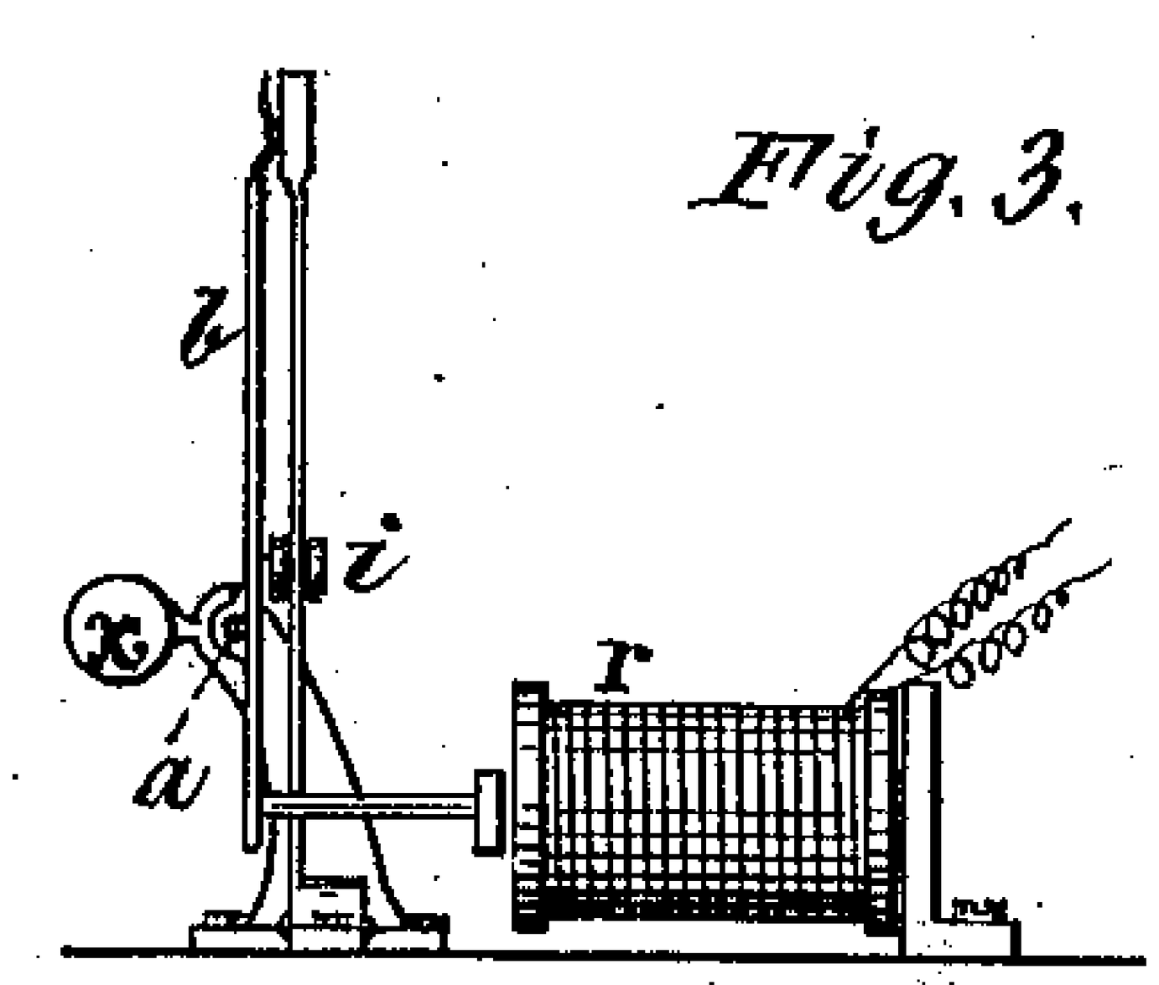


Fig. 5.

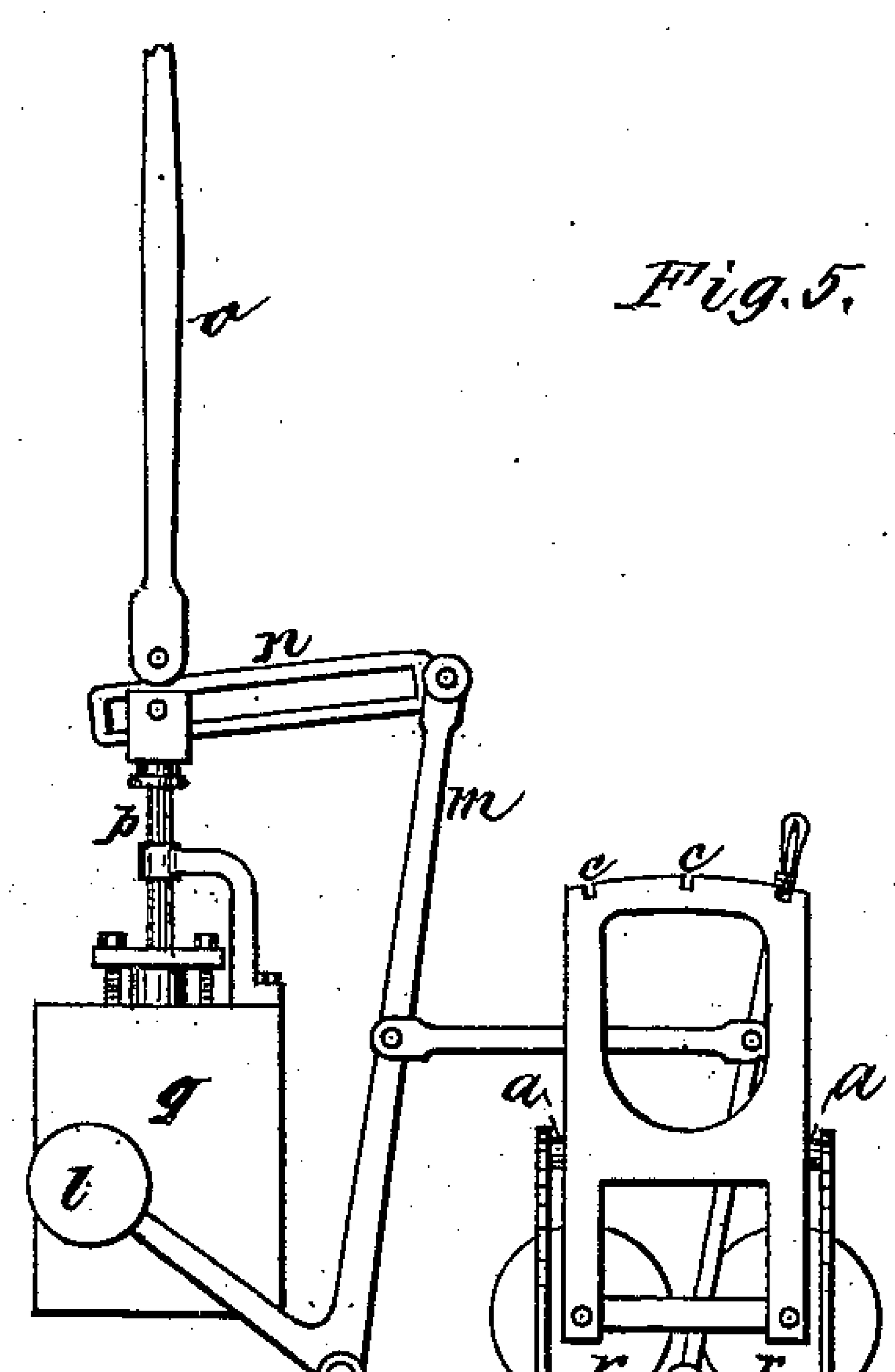
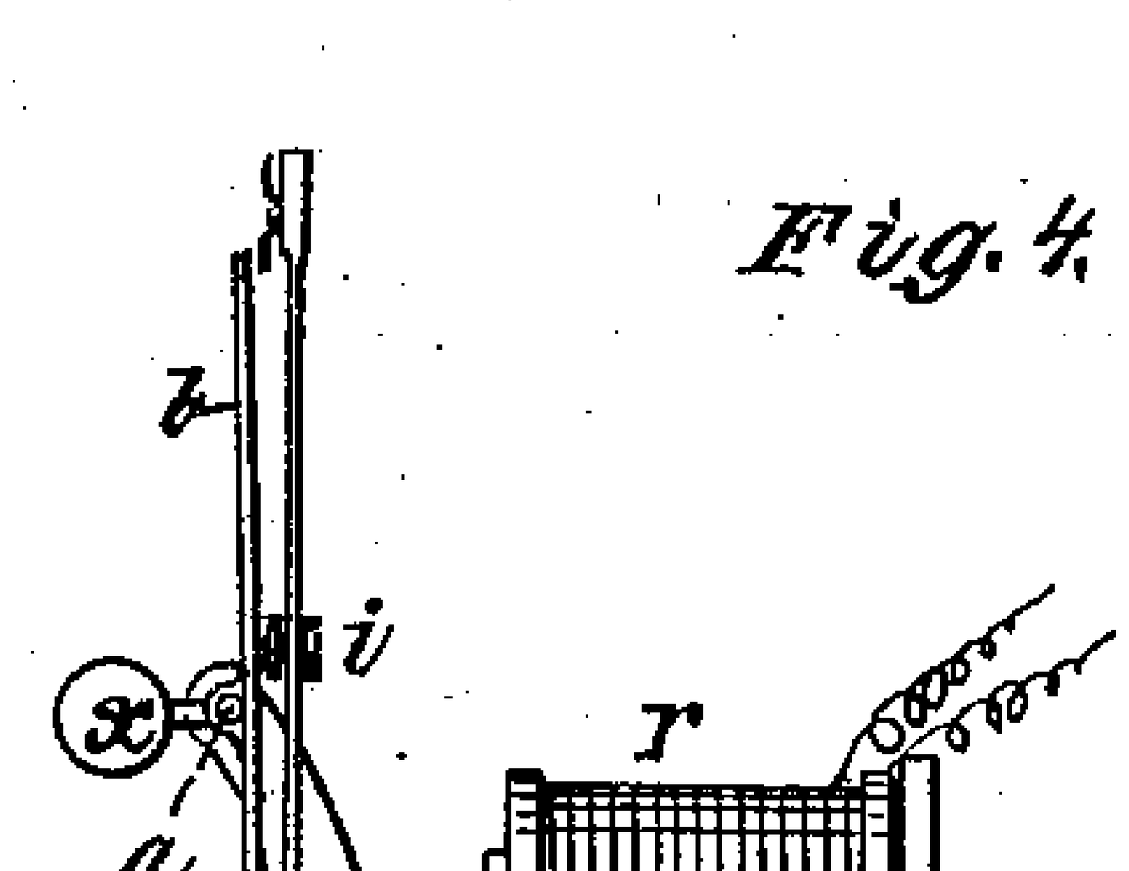


Fig. 4.



Witnesses:
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attys

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

OTTO NOLL, OF BERLIN, GERMANY, ASSIGNOR TO THEODOR SCHILLER AND PAUL BRENNICKE, BOTH OF SAME PLACE.

APPARATUS FOR STOPPING STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 370,644, dated September 27, 1887.

Application filed March 25, 1886. Serial No. 196,441. (No model.) Patented in Germany February 7, 1886, No. 38,630; in Belgium February 11, 1886, No. 71,939; in France February 11, 1886, No. 174,088; in England February 11, 1886, No. 2,016; in Norway February 16, 1886, No. 57; in Spain February 23, 1886, No. 8,713; in Italy March 20, 1886, No. 19,547; in Denmark June 4, 1886, No. 617, and in Austria-Hungary August 2, 1886, No. 6,788 and No. 36,772.

To all whom it may concern:

Be it known that I, OTTO NOLL, machinist, of Berlin, in the Kingdom of Prussia, Germany, have invented new and useful Improvements in Apparatus for Stopping Steam or other like Motive-Power Engines, of which the following is a specification, reference being had therein to the accompanying drawings, (no patents being obtained by me anywhere for this invention until now, save in Belgium, No. 71,939, dated February 11, 1886; Denmark, No. 617, dated June 4, 1886; France, No. 174,088, dated February 11, 1886; Great Britain, No. 2,016, dated February 11, 1886; Austria-Hungary, No. 6,788 and No. 36,772, dated August 2, 1886; Italy, No. 19,547, dated March 20, 1886; Spain, No. 8,713, dated February 23, 1886, and in Norway, No. 57, February 16, 1886.)

This invention has for its object an apparatus by means of which all kinds of motors—as steam-engines and so on—may be instantly stopped from any part of the factory, even when running at full speed. With this new apparatus in case of an accident, for example, a single movement of a handle suffices to throw out of action instantly and without the aid of the engineer the motor, and, consequently, the transmissions and operators driven by it. Said apparatus consists of a combination of mechanisms, hereinafter described, whereby the valve-gear is shifted into such a position as to close, in a steam-engine, for instance, the ports designed for letting in the steam, and consequently prevent the steam acting upon the piston.

In order that my said invention may be fully understood, I shall now proceed to describe the same, and for that purpose shall refer to the several figures on the annexed sheet of drawings, the same letters of reference indicating corresponding parts in all the figures.

Figures 1 and 3 of the accompanying drawings represent, respectively, a side and a front elevation of an apparatus according to this invention applied to a horizontal steam-engine, the parts being shown in the positions which they occupy when the apparatus is in its normal condition and the engine is in motion. Figs. 2 and 4 represent similar views showing the position of the parts when the apparatus has been brought into action so as to stop the engine. Fig. 5 illustrates my invention as applied to a vertical engine.

The arrangement of apparatus illustrated in the drawings is shown in connection with an ordinary flat slide-valve; but it is evident that my invention may be applied to engines or motors working with any other description of valve controlling the admission and exhaust of the motive fluid.

The improved apparatus is provided with a frame, *b*, capable of rocking or oscillating on a shaft, *a*, and provided at its upper part with a suitable segment, presenting notches *c*, with which engages a hand-lever, *d*, controlling the action of the valve according to the motive power required. The lever *a* turns upon an axis at *e*, and is connected at *k* by a link, *i*, to the arm *g* of a lever, *g m*, centered at *h* in a support or pillar, *f*. An arm carrying a counter-weight, *l*, is attached to the axis of this lever, in order to insure the proper action of the apparatus. The arm *m* of the aforesaid lever *g m* is connected to the upper extremity of a slotted link, *n*, jointed at its lower extremity to an eccentric-rod, *o*, which, by the intervention of the aforesaid slotted link, operates a rod, *p*, connected to the slide-valve, working in a valve-chest, *q*.

Facing the lower end of the frame *b* there are provided one or more electro-magnets, *r*, which attract this part of the frame when excited and cause the frame to swing on its axis, so that the upper part or notched segment moves away from and releases the lever *d*, which falls over in the direction of the lever-arm *m*, and the latter descends under the influence of its own weight. At the same time the eccentric-rod *o* is moved downward, describing an arc of a circle, so that the link *n*, connected therewith, pulls the valve-rod *p* outward. This latter motion places the valve-gear in a position in which both steam-inlet ports are maintained closed in all positions of the crank. The valve being thrown out of action by the mechanism hereinbefore described,

and the inlet and outlet ports maintained closed entirely, separate and perfectly closed layers or cushions of steam are formed on each side of the piston, whose motion is thereby retarded, so that the engine is instantly and easily stopped without a jerk or recoil.

The mechanism may evidently be worked mechanically by means of wires in place of electrically, as hereinbefore described, connections being established in either case with all parts of the works or factory. The handles, pulls, or switches may be placed upon the machines themselves in such a position that in case of accident the operative, finding himself in danger, may instantly bring the apparatus hereinbefore described into action and arrest the motion of the machinery.

The action of the apparatus illustrated in Fig. 5 will be readily understood by reference to the drawings, the same letters of reference being used to indicate corresponding parts, as in the arrangement hereinbefore described with reference to Figs. 1 to 4.

It will be readily understood that the invention is not necessarily limited to the precise details as hereinbefore described and illustrated, and particularly mentioned in the claiming clause, as their equivalents or mechanical substitutes, such as are within the knowledge of engineers, may be, it is evident, employed, according to circumstances.

What I claim, and desire to secure by Letters Patent of the United States, is—

An apparatus consisting of the arrangement and combination of parts for operating, substantially as hereinbefore described, for stopping steam or other motive-power engines from any distance or desired position, consisting of an oscillating frame, *b*, having therein notches *c*, engaging with a lever, *d*, centered at *e*, for ordinarily controlling the action of the slide-valve according to the motive power required, the said apparatus further comprising a lever-arm, *g*, connected to the said lever *d* by means of a link, *i*, and operating a lever-arm, *m*, centered to a support and provided with a counter-weight for the purpose of insuring the correct action of the apparatus, the front end of the said lever-arm *m* being jointed to a slotted link, *n*, connected to the eccentric-rod *o*, operating the rod *p*, attached to the valve in the valve-chest *q*.

In witness whereof I have hereunto set my hand in presence of two witnesses.

OTTO NOLL.

Witnesses:

B. ROI,

WILHELM PATAKY.