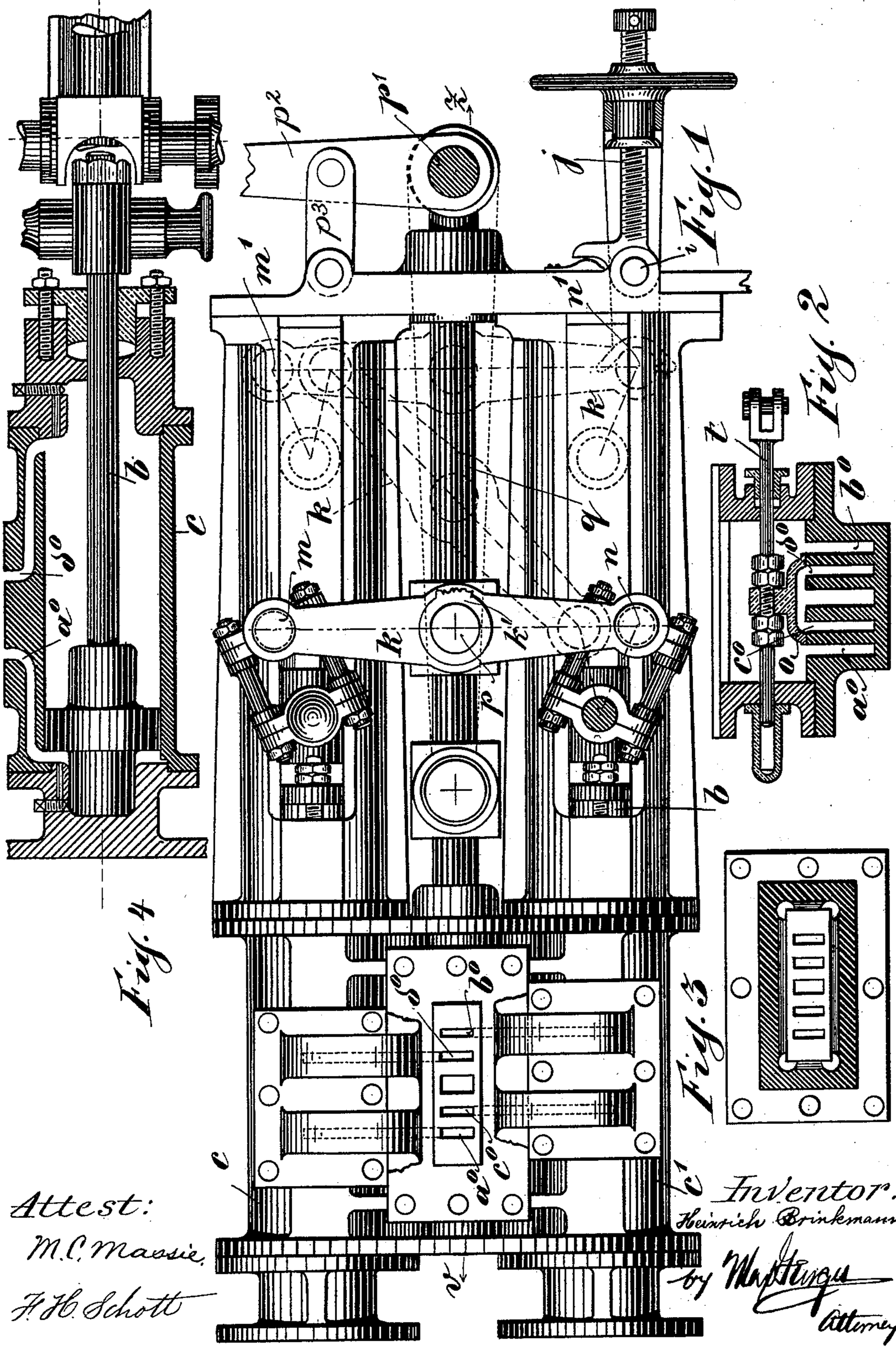
(No Model.) 3 Sheets—Sheet 1.

H. BRINKMANN.

SHIFTING OR REVERSING GEAR.

No. 585,649. Patented July 6, 1897.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 6.

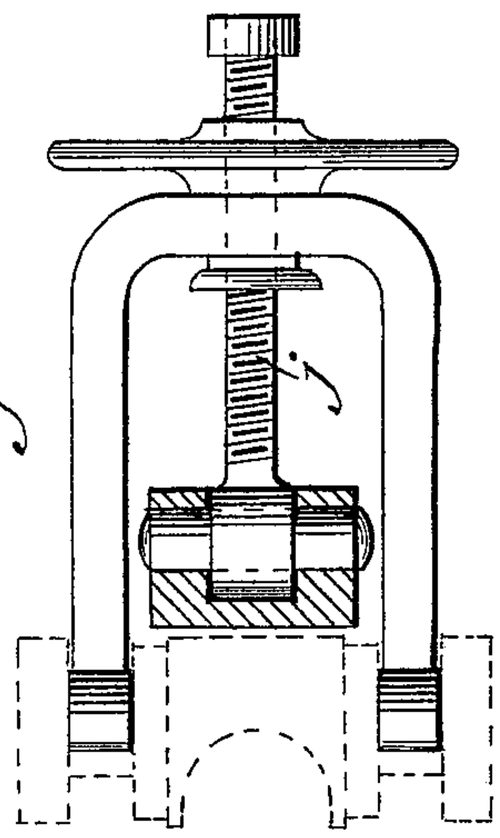


Fig. 7.

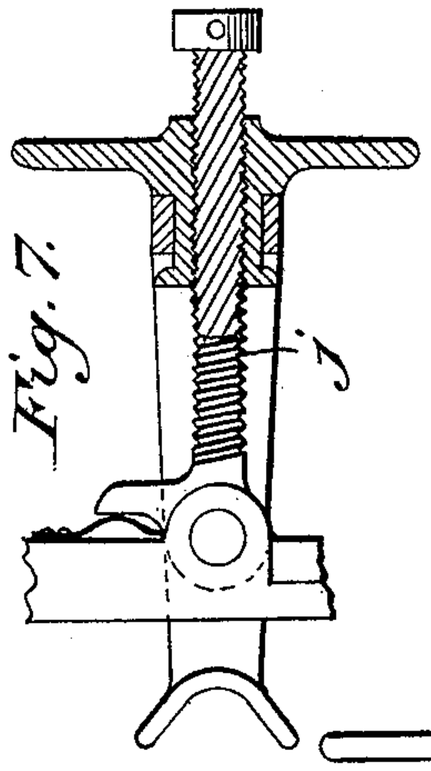
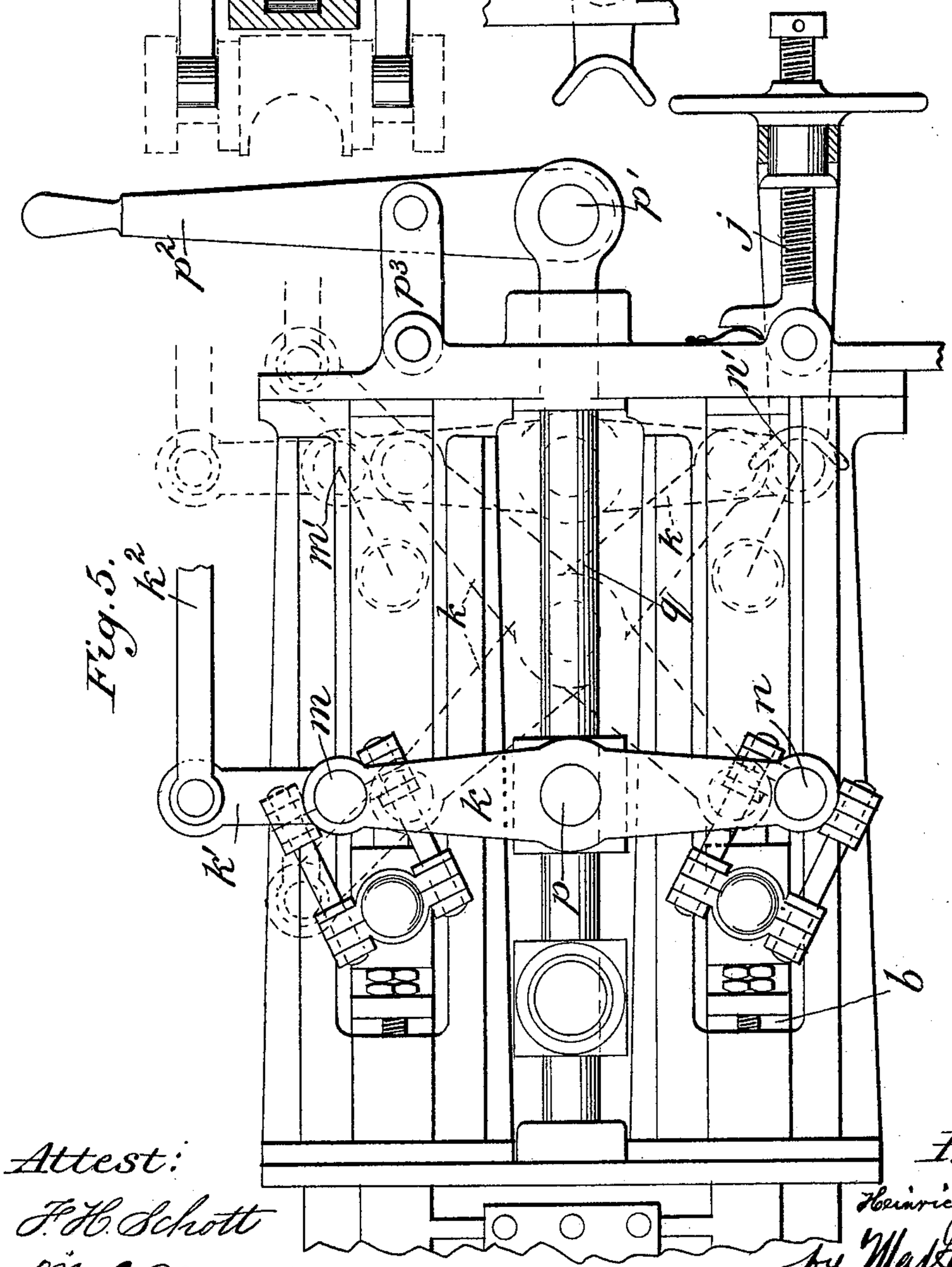


Fig. 5.



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(No Model.) 3 Sheets—Sheet 3.

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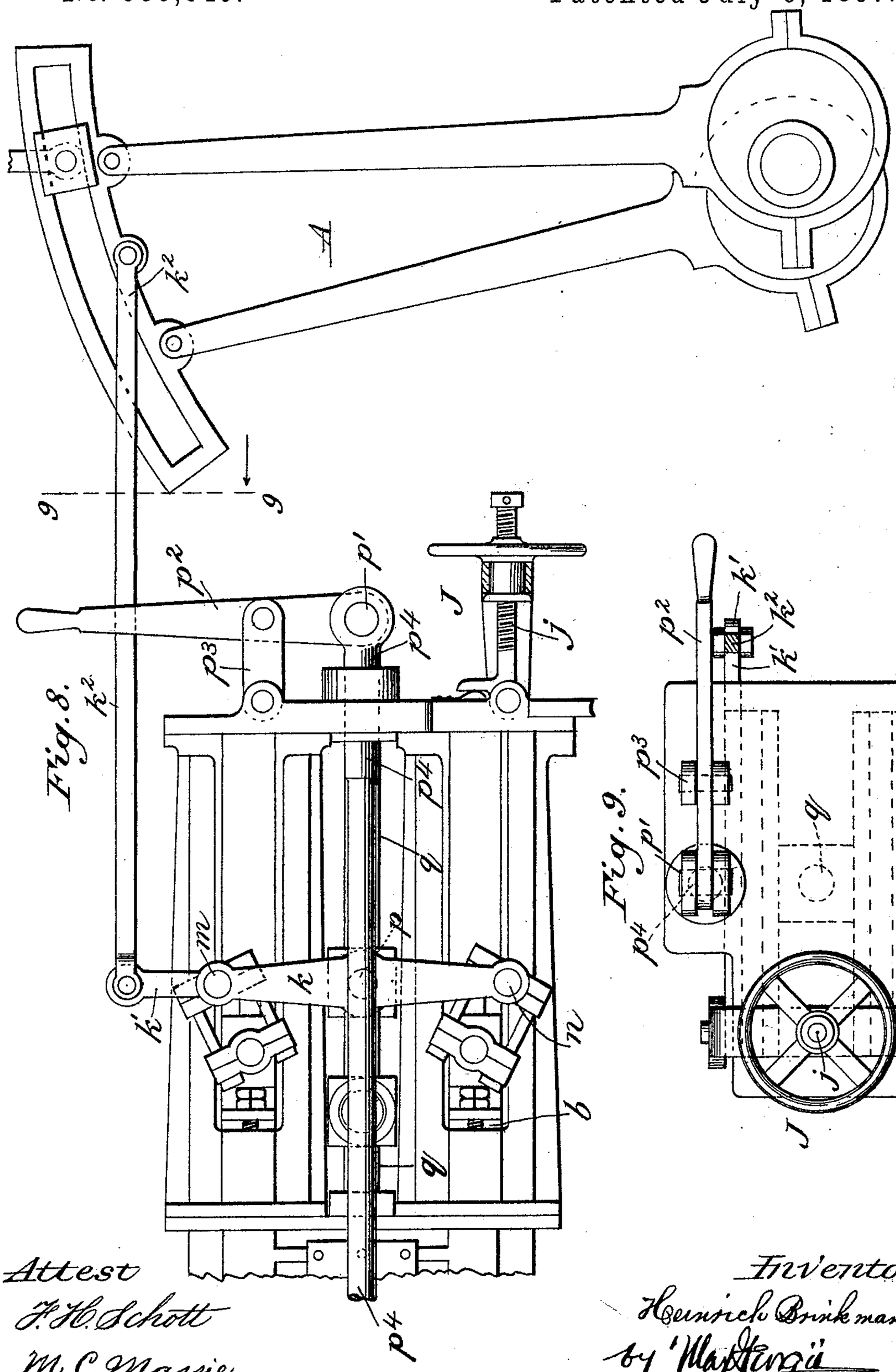

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UNITED STATES PATENT OFFICE.

HEINRICH BRINKMANN, OF MUNICH, GERMANY.

SHIFTING OR REVERSING GEAR.

SPECIFICATION forming part of Letters Patent No. 585,649, dated July 6, 1897.

Application filed October 20, 1896. Serial No. 609,394. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH BRINKMANN, a citizen of Germany, residing at Munich, Bavaria, Germany, have invented certain new and useful Improvements in Shifting or Reversing Gear; and I 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.

This invention relates to shifting and reversing gear, particularly applicable to engines operated by fluids; and its object is to provide means whereby a point or part of reversible machinery—for example, a part of the motive mechanism—may be adjusted to and secured in different positions. Such machinery may be the mechanism for reversing the blades of screw-propellers, marine engines in general, and reversible machinery of the most various descriptions—such as, for example, conveyers, elevators and hoists for mining and metallurgical purposes, machinery for rolling-mills, steam and street rollers, steam and hydraulic cranes and derricks, and the like.

For these purposes my invention consists in the features, mechanism, and combination of parts set forth in the accompanying specification and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 represents an elevation or plan of so much of a reversing mechanism embodying my invention as is necessary to fully illustrate the same; Fig. 2, a detail sectional view of the slide-valve box or chest; Fig. 3, a plan of the valve-seat; and Fig. 4, a detail sectional view, partly in elevation, of one of the cylinders and pistons. Fig. 5 is an elevation of a modified form of my invention to be described hereinafter. Figs. 6 and 7 are detail views of the swinging yoke or stop device. Fig. 8 is an elevation showing my invention in one form of its application. Fig. 9 is an end view looking in the direction of the arrow, Fig. 8.

The mechanism thus illustrated consists of two compressed-air cylinders c c', whose piston-rods b are connected with push rods or links b' in the manner of pitmen, the free ends of the said push rods or links b' being connected to a walking-beam or rock-lever k, which is pivoted upon a wrist-pin p, attached to a block movable longitudinally upon a guide-rod q, which is fixed at each end in the framework of the apparatus, as shown.

The air-supplying channels or ports a^0 b^0 c^0 d^0 of the two compressed-air cylinders communicate with a single slide-valve box or chest in the form of apparatus represented, both compressed-air cylinders being controlled by a single slide-valve o, operated by a valve-rod t, which is connected to a hand-lever p^2 by a rod p^4, passing through the front of the framework, the hand-lever being fulcrumed on a link p^3, pivoted to the front of the framework. However, each cylinder may be provided with a separate slide-valve, if desired.

If the slide-valve o occupies an intermediate position, as indicated in Fig. 2, the rock-lever k will be caused to assume the oblique position indicated by broken lines in Fig. 1. The pivotal point p will then also occupy an intermediate position. If now the slide-valve o is drawn in the direction of z by means of the reversing-lever, the piston is reversed in consequence of the influx of pressure at c^0 and the escape of the resisting pressure at b^0, the rock-lever k being thereby caused to occupy the position indicated by dot-and-dash lines m' n', Fig. 1.

It will be readily understood that on reversing the apparatus by moving the slide-valve o in the opposite direction by means of the hand-lever p^2 the rock-lever k and its fulcrum p will again occupy an intermediate position, (indicated by m' n'.) If the slide-valve o is then moved farther in the direction toward v, the pressure will enter the port d^0, while the load on the piston will escape through port a^0, cylinder c' remaining under pressure through the port b^0, whereby the rock-lever k will be caused to assume the position indicated by full lines m n. By this means the machine element, which is connected to the fulcrum p by suitable means, such as the rod k^2, will be shifted to and retained in the desired position.

If the point of attachment of the rod k^2 be transferred from the fulcrum p to a point outside the cylinder, the said point of attachment may be given four different positions,

whereby the machinery to be shifted may be brought in four different positions also. This form of my invention is illustrated in Figs. 5, 8, and 9, where the rock-lever k is shown as extended at one end, the said extension k' being connected by suitable means, such as the rod k^2, to the mechanism to be shifted. As illustrating one application of my invention I have shown my device connected to the link-motion A of a marine engine, it being understood, of course, that the proportions of the link-motion A relative to the shifting mechanism are greatly reduced in order to properly show the two mechanisms on one sheet of the drawings. The rock-lever k is shown in one position in full lines in Fig. 5 and in three other positions in dotted lines, thus illustrating how the connection between the rod h^2 and the extension k' is brought into four different positions.

In order to shift the rock-lever k into other positions than will be given to it by the pistons and piston-rods of my improved device, I provide an adjustable stop device J, which is arranged to limit the movement of the rock-lever k. This stop device comprises a yoke having ends arranged to contact with one end of the rock-lever k, said yoke being carried by a collar which is provided with a hand-wheel and is threaded onto a screw j, pivoted in bearings on the framework of the device, said pivoted end having a shoe projecting laterally and engaging a spring secured on the framework, whereby when the rock-lever k is drawn away from the end of the yoke the latter will be swung out of the way of the rock-lever by the action of the spring. By turning the hand-wheel the yoke may be adjusted within certain limits to stop the rock-lever at any desired point within the limit of movement of said yoke, thus giving many new positions of the rock-lever, and consequently of the rod k^2 and the mechanism operated by it. The yoke is made to swing in order that it may be shifted out of the way when not in use. It is swung into operative position by hand and held until it is engaged by the end of the rock-lever k.

What I claim, and desire to secure by Letters Patent, is—

1. In a shifting-gear, the combination, with a pair of cylinders, a piston in each cylinder, and a piston-rod connected to each piston, of a walking-beam attached to both piston-rods, a movable pivot on which the walking-beam is fulcrumed, a valve device arranged to control the supply of fluid to the cylinder, and means connected to the walking-beam for operating the desired mechanism, substantially as set forth.

2. In a shifting-gear, the combination, with a pair of cylinders, a piston in each cylinder, and a piston-rod attached to each piston, of a valve for controlling the supply of fluid to each cylinder, a valve-rod connected to said valve, a guide-rod, a pivot-pin movably mounted on the guide-rod, a walking-beam fulcrumed on the pivot-pin and connected to the piston-rods, substantially as set forth.

3. In a shifting-gear, the combination, with a pair of cylinders, a piston in each cylinder, a piston-rod connected to each piston, of a valve-box provided with a double set of induction and eduction ports and with an exhaust-port, one induction-port and one eduction-port of each set leading to one of the cylinders, and the other induction and eduction port to the other cylinder, a slide-valve movable in the valve-box and arranged to control the flow of the fluid through the ports, means for operating the slide-valve, a walking-beam connected to the piston-rods, and means connected to the walking-beam for shifting the desired mechanism, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HEINRICH BRINKMANN.

Witnesses:
A. M. CICKENBERG,
CARL MAYER.