

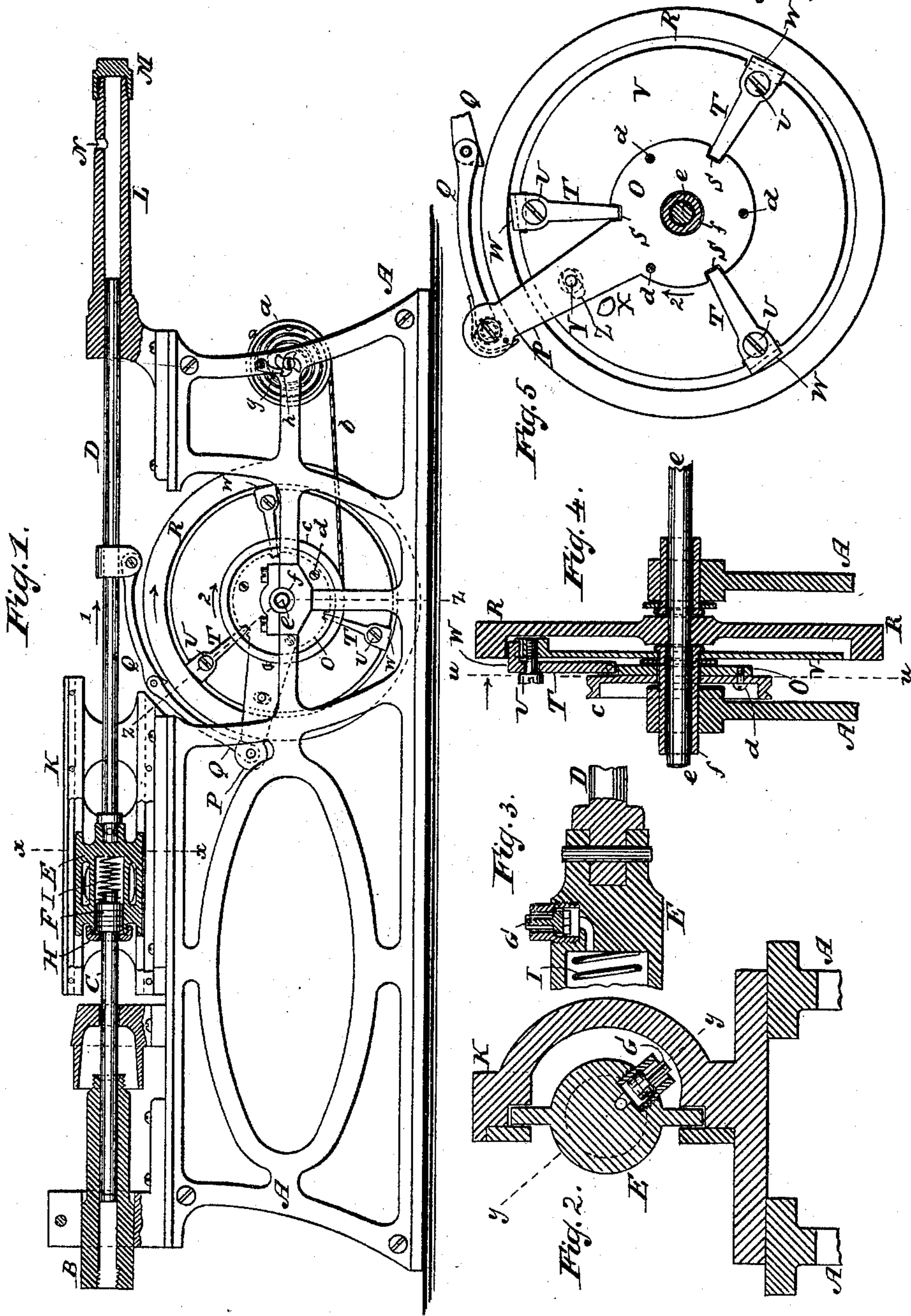
(No Model.)

2 Sheets—Sheet 1.

H. A. KINGSLAND & W. P. SANGER.
MOTOR.

No. 497,246.

Patented May 9, 1893.



WITNESSES:

Edward Wolff
William Miller

INVENTORS:
Hugh A. Kingsland
& *Whiting P. Sanger*
BY
Van Santvoord & Hendy
ATTORNEYS.

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Fig. 7.

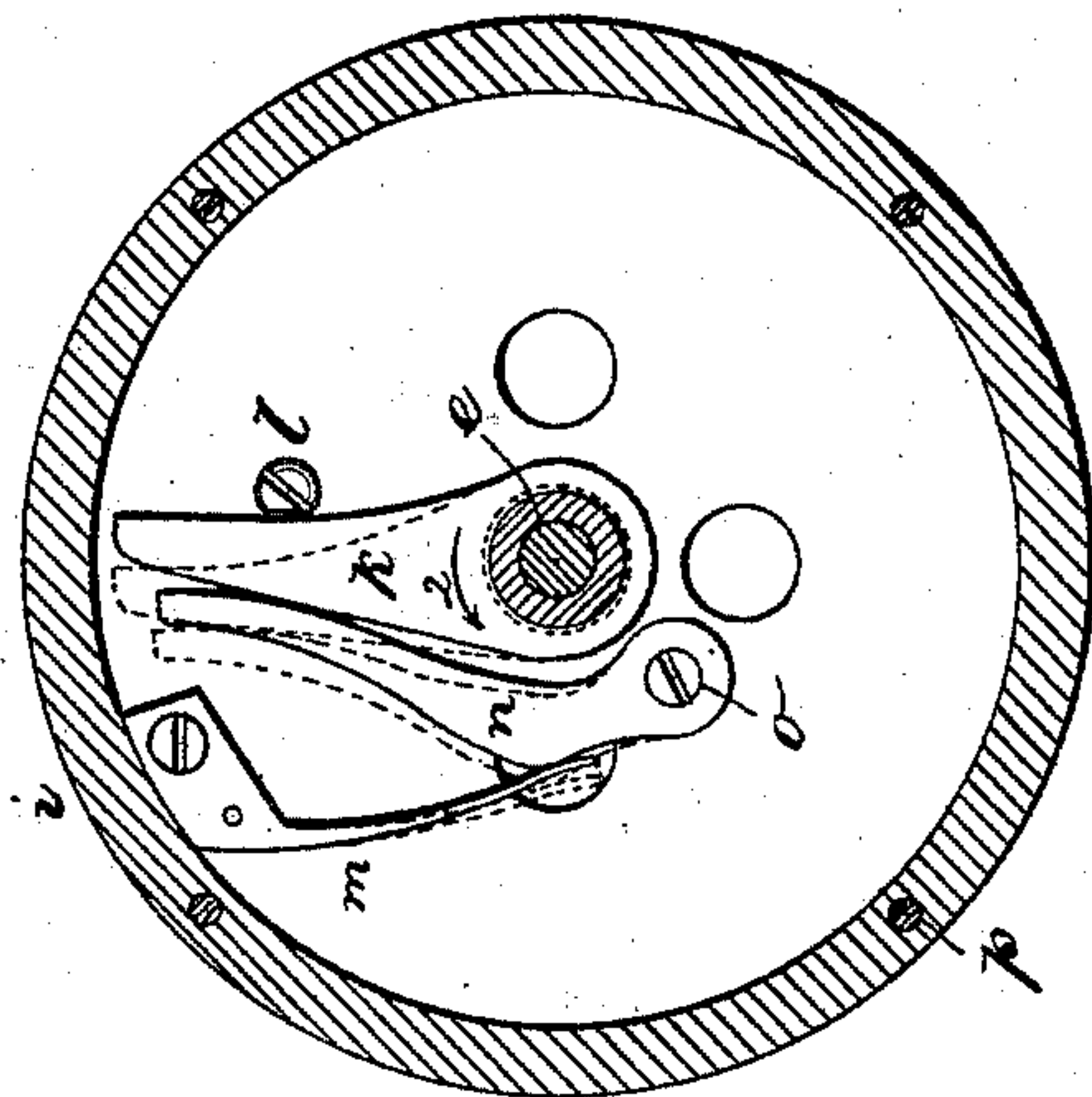
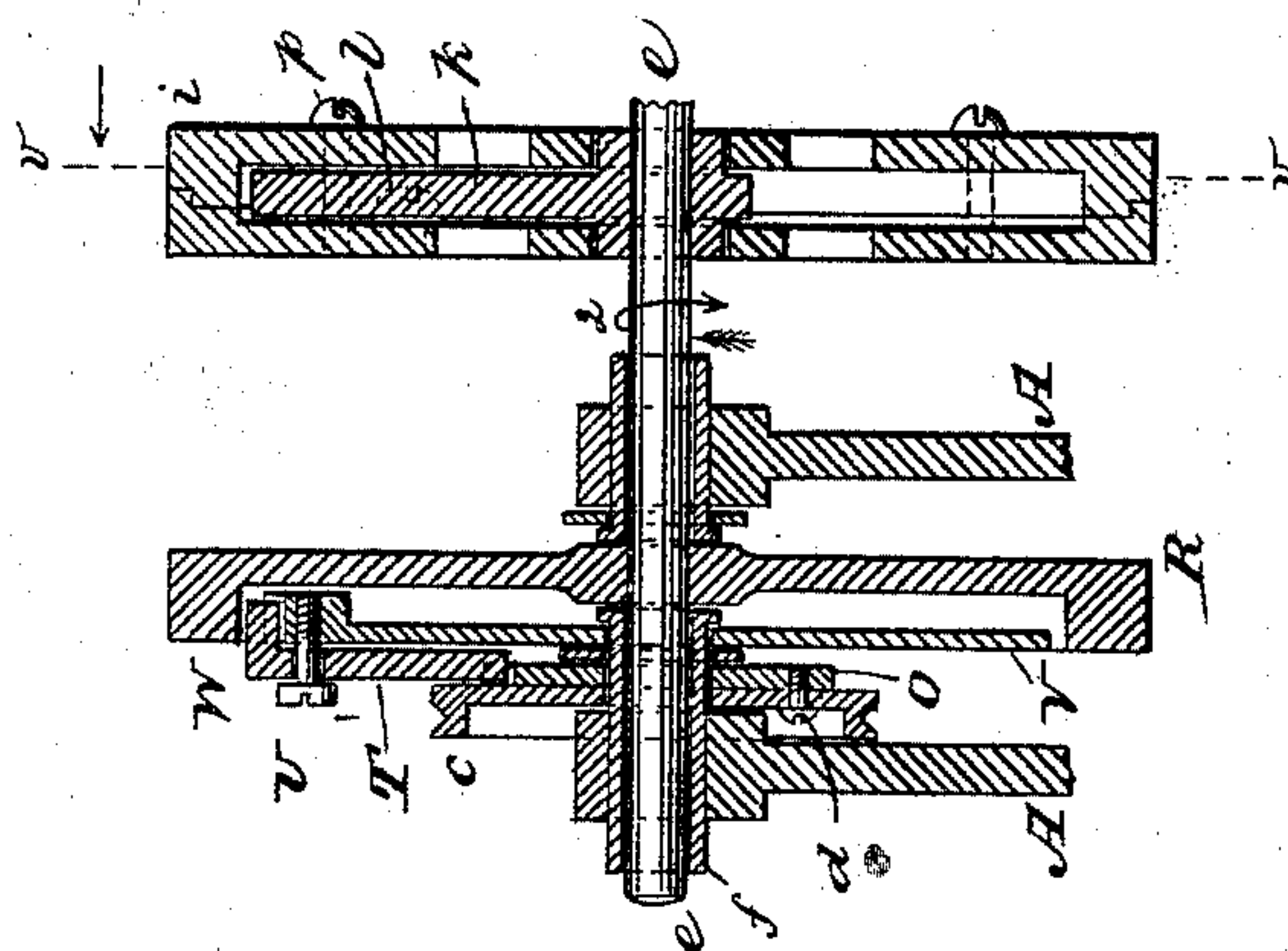


Fig. 6.



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UNITED STATES PATENT OFFICE.

HUGH A. KINGSLAND, OF BELLEVILLE, AND WHITING P. SANGER, OF
EAST ORANGE, NEW JERSEY.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 497,246, dated May 9, 1893.

Application filed May 19, 1892. Serial No. 433,620. (No model.)

To all whom it may concern:

Be it known that we, HUGH A. KINGSLAND, residing at Belleville, and WHITING P. SANGER, residing at East Orange, in the county of Essex and State of New Jersey, citizens of the United States, have invented new and useful Improvements in Motors, of which the following is a specification.

This invention relates to an improvement in motors and the invention consists in the novel features pointed out in the following specification and claims and illustrated in the annexed drawings in which—

Figure 1, is a side elevation, partly in section, of the motor. Fig. 2, is a section along $x x$ Fig. 1 enlarged. Fig. 3, is a section along $y y$ Fig. 2. Fig. 4, is a section along $z-z$ Fig. 1 enlarged. Fig. 5, is a section along $u-u$ Fig. 4. Fig. 6, is a section similar to Fig. 4 showing means for transmitting power. Fig. 7, is a section along $v-v$ Fig. 6.

In the drawings the letter A indicates a frame or support, and B is a driving chamber or cylinder in which the requisite force is generated in any suitable well-known way, as by steam or by explosive, such for example as naphtha, or in any other suitable manner. The force or pressure in cylinder or chamber B drives a rod or piston forward or in the direction of arrow 1 (Fig. 1). This rod is formed in two parts or sections C, D, and a cushion is interposed between said sections. This cushion is composed of a cylinder or chamber E connected to one of the rod sections, the other section being provided with a piston F fitted into said cylinder E. In case the rod section C is driven forward with great intensity or suddenness the piston F will be forced into cylinder E so as to compress the air in the latter, whereby the force or power from rod section C will be gradually transmitted to the rod section D, to avoid any sudden jar of the device. The cylinder E and piston F, in other words, form an air cushion to prevent shocks or injury. The cylinder E has an inlet valve G allowing air to enter in front of the piston F but preventing the exit of air. The piston is prevented from coming out of cylinder E by means of a stop or cap H. When the pressure on rod section C ceases, the compressed air in the cylinder E will

often suffice to return the piston F toward the stop H but a spring I may be applied to aid in such return of the piston. The cylinder E moves in suitable guides or ways K. The free end of rod section D is fitted to slide in the cylinder or chamber L having its end portion closed at M. An opening N is located a certain distance from the closed end. When the rod section D moves forward the air in chamber L escapes at opening N until such opening has been passed by the end of rod section D after which the air is compressed in the closed end portion of chamber L. This compressed air forms an air cushion to prevent slamming of the rod section D and at the same time such compressed air acts to give the rod section D its return stroke. From the driving rod C D the power is transmitted to a clutch actuating disk or plate O by means of arm P and chain or connection Q. When the disk or plate O is rotated forward or in the direction of arrow 2 it rotates the fly wheel or rim R in the same direction as will be presently explained, but the return or backward rotation of plate O does not affect the wheel R, but leaves the latter free to rotate forward. The disk or plate O has slots or recesses S engaged by clutch arms T pivoted or jointed at U to a clutch disk or plate V. The faces W of the clutch arms extend between the wheel or plate V and the surrounding wheel or rim R, and said faces are somewhat inclined or curved as seen in Figs. 1 and 5, so that on the forward rotation of disk O and the consequent twist or swing of arms T about the pivots or supports U the faces W will clutch or jam between the wheel V and rim R. On the backward rotation of the disk O and arm P the plate V remains stationary until the arm P strikes the stop X thus swinging the arms T so as to unbind or loosen the faces W in the space between plate V and rim R. The plate V is rotated backward when the arm P strikes the stop or lug X thereby moving the clutch arms T backward for obtaining a fresh grip on the rim R on the next forward stroke of the arm P. The arm P and plate V are shown connected by a pin and slot connection Y Z for allowing said parts some independent motion. The return motion of disk O may be aided or effected

by a weight or spring drum *a* from which a cord or connection *b* extends about the pulley *c* fixed by screws or fastenings *d* to the disk *O*. The wheel or rim *R* is fixed to the shaft *e* so that the latter is rotated by the wheel *R* and the rotation of shaft *e* can be utilized in any suitable way. This shaft *e* extends loosely through a sleeve *f*, on which are mounted the disks or plates *O* *V* and pulley *c*. The tension of the spring of drum *a* can be regulated by a pawl *g* and ratchet *h* (Fig. 1).

A convenient way of transmitting power without shocks or jars is as follows: On shaft *e* is loosely mounted a fly wheel or pulley *i*. An arm *k* fixed to shaft *e* is held against a stop or stud *l* on wheel *i* by means of spring *m* secured to wheel *i* and made to press on the movable arm *n* jointed or pivoted at *o* to the wheel *i*. When the shaft *e* is suddenly rotated in the direction of arrow 2 (Figs. 1, 6 and 7) the arms *k* *n* and spring *m* yield as indicated by broken lines so that the power from shaft *e* is gradually transmitted to the pulley or fly wheel *i* so as to avoid a jar or shock. The wheel or pulley *i* can be conveniently made of two parts or sections held together by screws or fastenings *p* and power may be transmitted from pulley or wheel *i* by any suitable well known means such for example as a belt.

We do not limit the employment of our mechanism to any particular machine or class of machines since the motion may be transmitted from the fly wheel by a belt or suitable device to a variety of machines as for ex-

ample pumping mechanisms, grinding mechanisms or mills and other devices. The device might also serve to actuate fans or fan blowers.

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination with a driving rod or piston made in two parts or sections, of a driving chamber or cylinder into which one rod section extends and a cushioning chamber having a closed end portion, the other rod section being snugly fitted into said cushioning chamber so as to be cushioned by the air therein on approaching the closed end of said cushioning chamber, substantially as described.

2. The combination with a driving rod or piston made in two parts or sections, of a driving chamber or cylinder into which one rod section extends, and a cushioning chamber into which the other rod section is fitted, said rod sections being provided with an interposed cushion consisting of a cylinder connected to one rod section and provided with an inwardly opening valve and a piston secured to the other rod section and fitted into said cylinder, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

HUGH A. KINGSLAND.
WHITING P. SANGER.

Witnesses:

WM. C. HAUFF,
E. F. KASTENHUBER.