

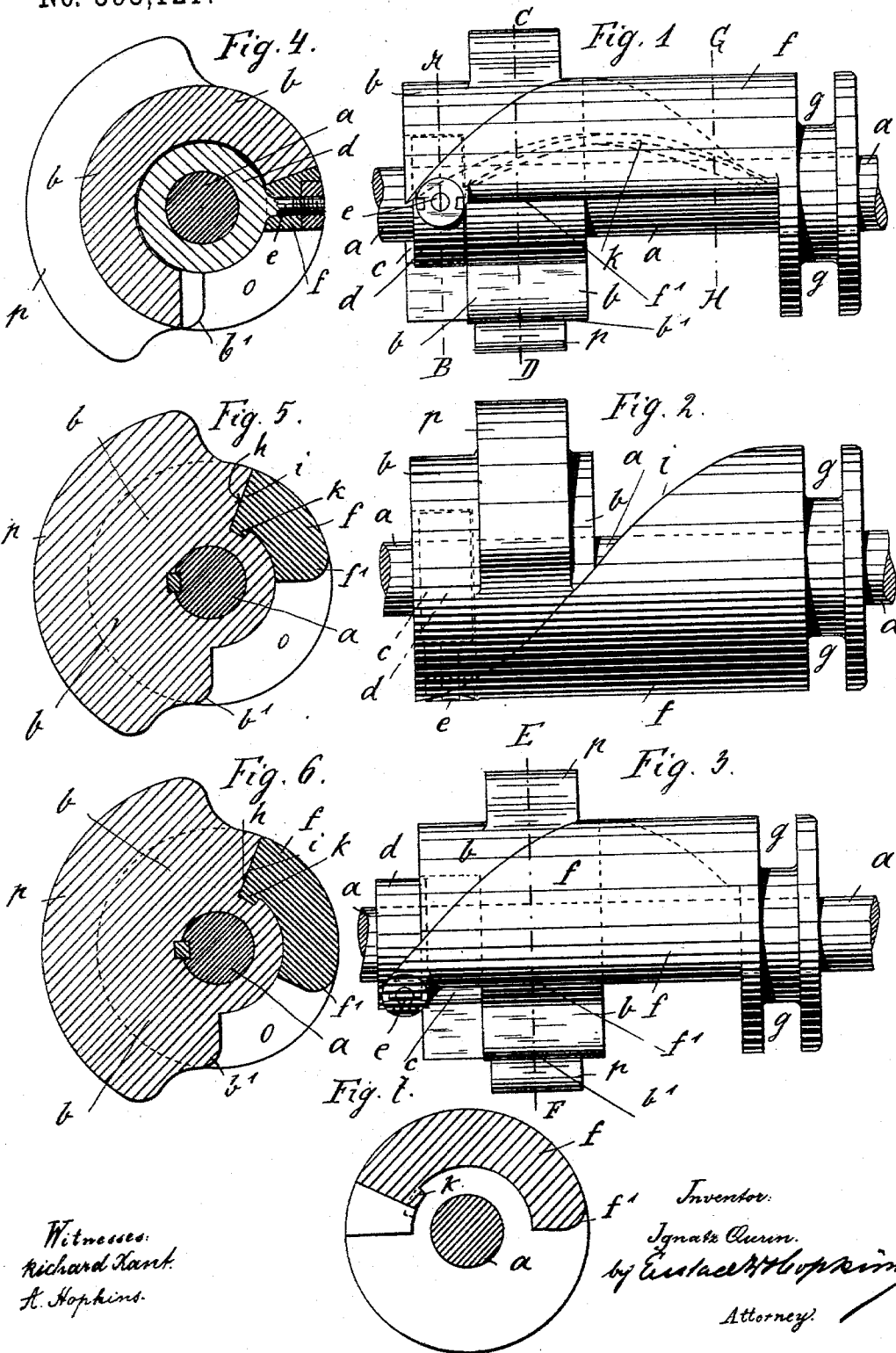
(No Model.)

2 Sheets—Sheet 1.

I. QURIN.
ADJUSTABLE CAM.

No. 593,121.

Patented Nov. 2, 1897.



Witnesses:
Richard Kant.
H. Hopkins.

Inventor:
Ignatz Qurin.
by Gustav H. Hopmann
Attorney.

(No Model.)

2 Sheets—Sheet 2.

I. QURIN.
ADJUSTABLE CAM.

No. 593,121.

Patented Nov. 2, 1897.

Fig. 9.

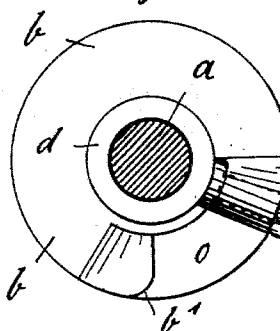


Fig. 8.

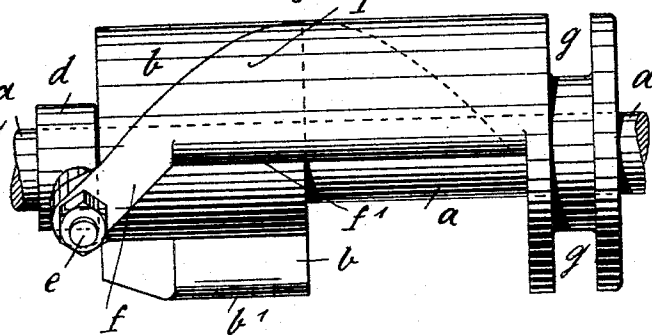


Fig. 12.

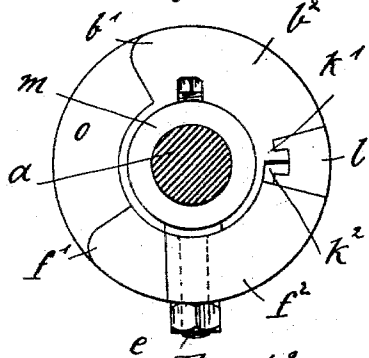


Fig. 10.

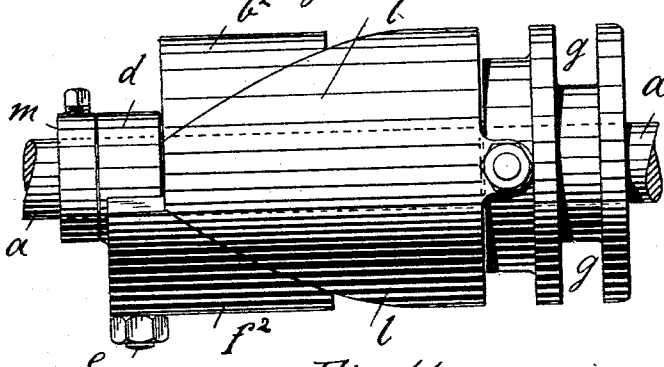


Fig. 13.

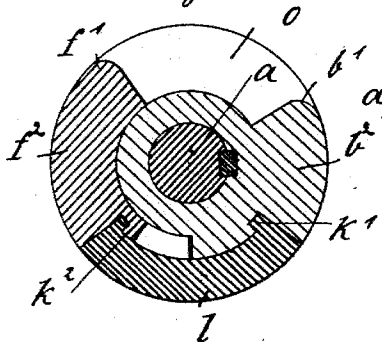
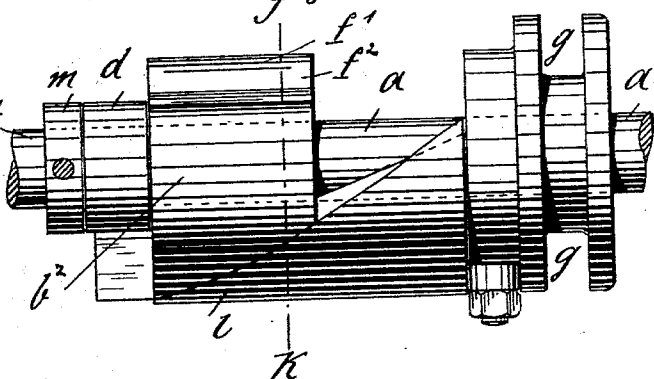


Fig. 11.



Witnesses:
Richard Hant.
H. Hopkins.

Inventor:
Ignace Qurin.
by Eustace H. Hoppin
Attorney.

UNITED STATES PATENT OFFICE.

IGNATZ QURIN, OF COLOGNE, GERMANY.

ADJUSTABLE CAM.

SPECIFICATION forming part of Letters Patent No. 593,121, dated November 2, 1897.

Application filed December 1, 1893. Serial No. 492,514. (No model.) Patented in Germany July 21, 1893, No. 73,754; in France August 28, 1893, No. 232,461; in England August 29, 1893, No. 16,290; in Belgium September 2, 1893, No. 106,210; in Switzerland March 7, 1894, No. 8,069; in Austria June 21, 1894, No. 44/4,348, and in Hungary June 21, 1894, No. 83,372/93.

To all whom it may concern:

Be it known that I, IGNATZ QURIN, a subject of the King of Prussia, German Emperor, and a resident of Cologne, in the German Empire, have invented certain new and useful Improvements in Adjustable Cams, of which the following is a full, clear, and exact description, and for which I obtained a patent in England, No. 16,290, dated August 29, 1893; in Germany, No. 73,754, dated July 21, 1893; in France, No. 232,461, dated August 28, 1893; in Belgium, No. 106,210, dated September 2, 1893; in Switzerland, No. 8,069, dated March 7, 1894; in Austria, No. 44/4,348, dated June 21, 1894, and in Hungary, No. 83,372/93, dated June 21, 1894.

The present invention consists of an adjustable cam by means of which the cam-surface may be varied within reasonable limits at will.

In order to make the present specification more easily intelligible, reference is had to the accompanying sheets of drawings, in which similar letters denote similar parts throughout the several views.

Figure 1 is a side elevation of my improved cam; Fig. 2, a plan; Fig. 3, an elevation showing a varied cam-surface; Fig. 4, a section A B in Fig. 1; Fig. 5, a section C D in Fig. 1; Fig. 6, a section E F in Fig. 3; Fig. 7, a section G H in Fig. 1. Fig. 8 is a side elevation of a modification of the invention. Fig. 9 is an end elevation of Fig. 8. Fig. 10 shows a further modification in elevation. Fig. 11 is a plan of Fig. 10; Fig. 12, an end elevation of Fig. 10, and Fig. 13 a section on line J K of Fig. 11.

Referring to Figs. 1 to 7, the cam part *b* is keyed to the shaft *a* and provided at its end with an annular depression *c*, in which lies a ring *d*, loose on the shaft *a* and provided with a radially-projecting screw-stud *e*. The part *b* may be provided with a cam-surface *p*, if desired, and also has a cam-surface *b'*, extending from the portion of the part *b* of larger diameter to the smaller diameter and forming with the shoulder *f'* of a sliding cam part hereinafter described a variable cam-surface *o*. As will be seen from Figs. 1 and 2, the part of the cam *b* possessing a larger diam-

eter is abruptly stopped at the opposite side to the shoulder *b'* to form a spiral bearing-surface *h*, Fig. 5, along which the sliding surface *i* of the part *f* may move. The sliding part *f* of the cam consists of a partial sleeve adapted to slide on the small part of the cam *b*, Figs. 4, 5, and 6, said slide being guided on the shaft *a* by means of the ring *d*, to which it is attached by the stud *e* penetrating the end of the slide and a suitable nut and at the opposite end by a flanged collar *g*, so that the same is capable of both longitudinal and rotary motion on the shaft. The surfaces *b'* and *f'* are parallel to the longitudinal axis of the shaft *a*, so that on sliding the latter along the former the distance *o* between the cam-surfaces will be varied. The slide *f* is guided on the part *b* by means of a spirally-wound rib on the same engaging a similarly-shaped groove *k* in the part *b*.

The operation of the device will be evident from the foregoing description.

In order to vary the cam-surface, it is only necessary to change the relative positions of the cam part *b* and the slide *f*, when the operative cam-surface *o* will be altered and in consequence the stroke of any part of a machine of any kind connected therewith.

In the modification shown in Figs. 8 and 9 the ring *d* is not sunk into the end of the part *b*; but the end of the slide *f* is produced beyond the end of the cam part *b* and the ring is arranged at the end of the said part *b*, so that it is not necessary to sink the same in the latter.

Figs. 10 to 13 show a further modification, according to which the cam consists of three parts, the part *b*² being fast on the shaft *a* and the part *f*² being revolutely attached to the same, but not longitudinally movable thereon. The two parts are shifted with regard to each other by means of a wedge-shaped sliding sleeve or partial sleeve *l*, guided on the shaft *a* by means of the collar or sleeve *g*. The wedge *l* is also guided on the parts *b*² and *f*² by means of spirally-wound grooves *k'* *k*² and projections on the said wedge engaging the grooves, Fig. 13. The part *f*² is in this case prevented from longitudinal movement on the shaft *a* by means of the collar *g* and

the ring *m* at the opposite end and the inserted wedge *l*. Obviously by shifting the wedge *l* on the shaft the position of the parts *b*² and *f*² with regard to each other, and thus
 5 that of the cam-surface *b'* or *f'*, will be varied.

The wedge *l* may be made in one piece with the sleeve *g* or may be attached to the same by means of a nut and lug, as shown at Figs.
 10 10 and 11.

I claim as my invention—

1. An adjustable cam consisting of a sleeve fast on the driving-shaft, a cam-surface *b'* to said sleeve as specified, the sleeve being depressed to form said cam-surface, the opposite edge of said depression being formed to a spirally-wound sliding surface, and a second sleeve to slide loosely on the driving-shaft and adapted to overgrip the depressed
 15 part of the first sleeve, a cam-surface *f'* to said second sleeve parallel to the driving-shaft and opposite to the said cam-surface *b'*, said cam-surface forming the edge on the overgripping part of the second sleeve, the
 20 opposite edge of said latter part being curved and means for adjusting the curved surfaces of said sleeves with regard to each other substantially as described.

2. An adjustable cam consisting of a part
 30 *b* having cam edge *b'* parallel to the axis of the shaft, said part being fast on said shaft, and being cut away to form said cam edge and an opposing spirally-wound sliding surface *h*, and a slide *f* revolubly mounted and
 35 longitudinally movable on the said shaft between the cam edge *b'* and the sliding sur-

face *h* said slide *f* having a cam-surface *f'* opposite to the cam-surface *b'* and means for guiding said slide on said cam part and for adjusting its position on the same longitudi- 40 nally.

3. In a cam, the combination of a part *b* having a cam edge *b'* and a spirally-wound edge *h* opposite thereto, said part being depressed between the two edges, a slide *f* arranged in said depression and having cam edge *f'*, there being a groove *k* in part *b* and a projection on said slide to engage said groove, said parts affording means for adjusting the cam edges *b'* *f'* with regard to each
 45 other, the said part *b* being fast on the shaft and the part *f* being loose on the same, in the manner and for the purpose substantially as described.

4. In a cam the combination of the part *b*
 55 having cam edge *b'* and spirally-wound guide edge *h*, said part being fast on the shaft and being depressed between the cam and guide edges, and a slide *f* mounted on the shaft to slide between the said edges of the part *b*,
 60 said slide having a guide edge to fit the guide edge *h* and being guided along said edge by means of a groove and projection in the manner and for the purpose substantially as described. 65

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

IGNATZ QRIN.

Witnesses:

FRITZ SCHROEDER,
 EVA HAUSEN.