

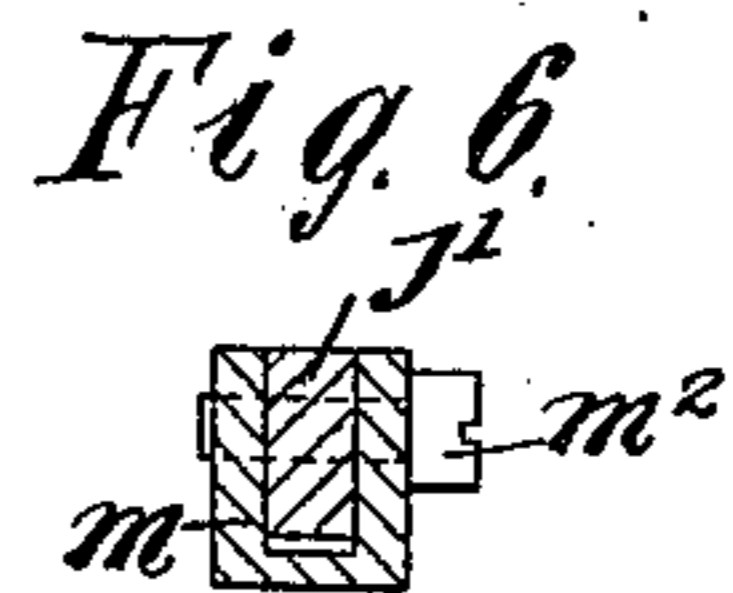
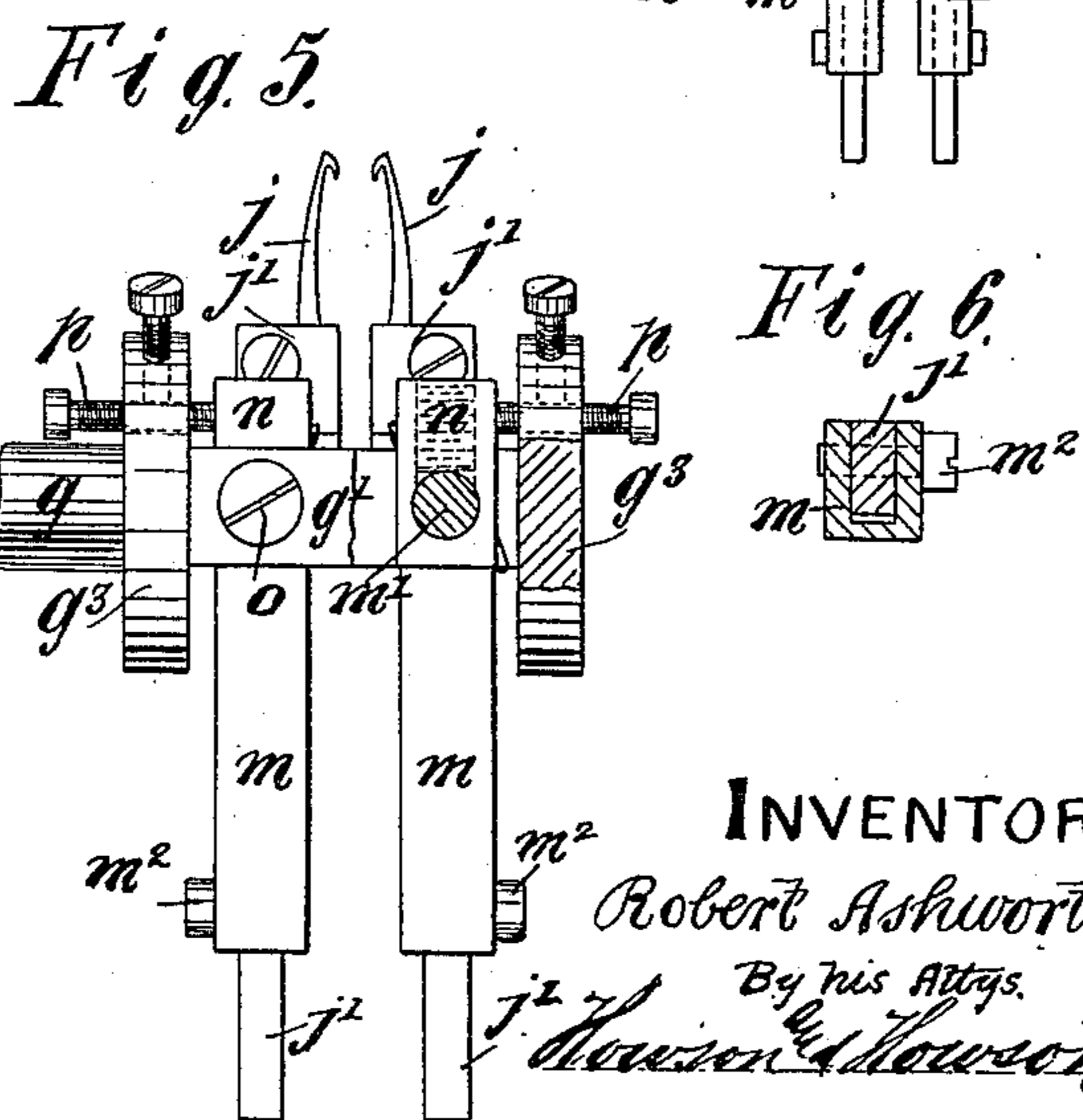
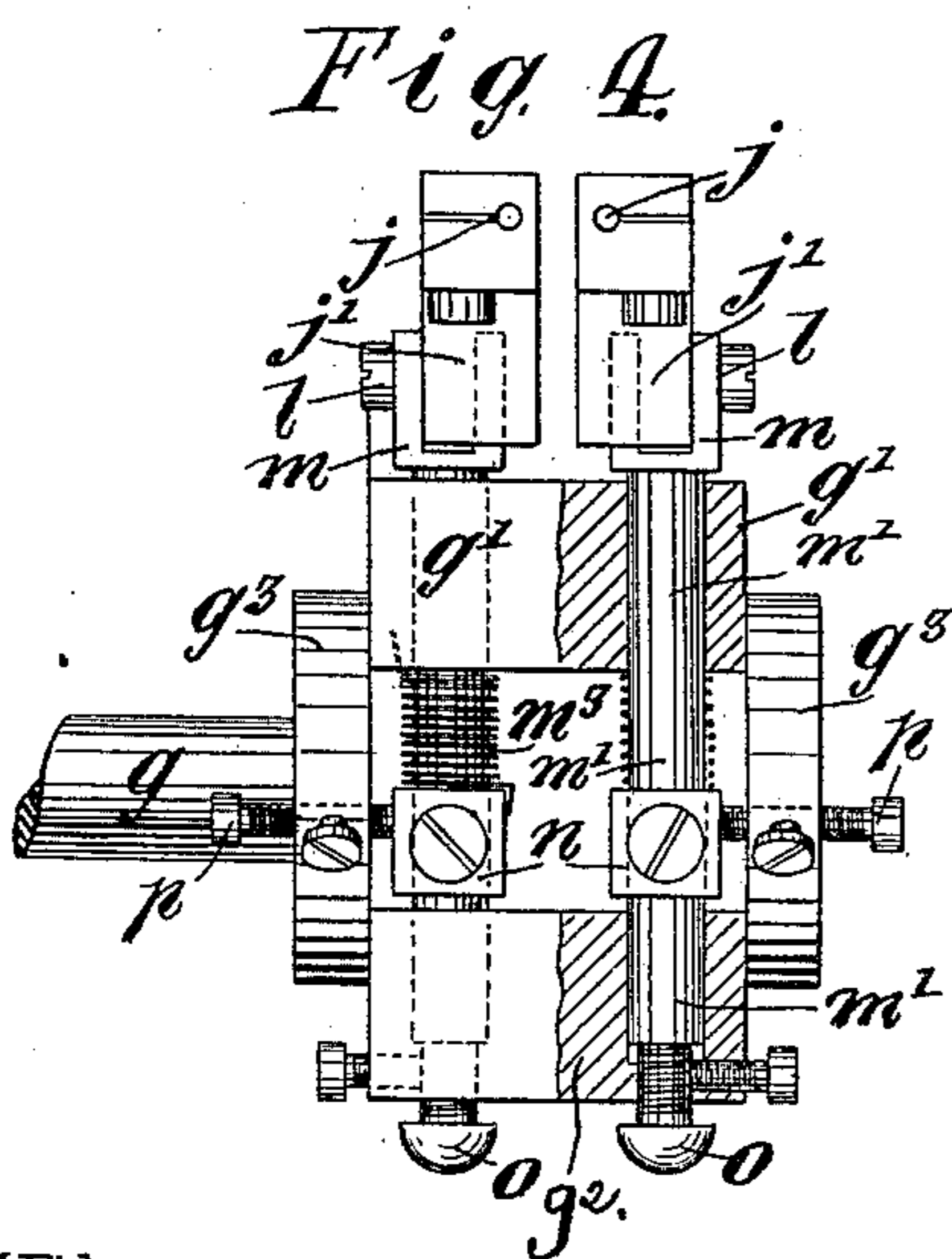
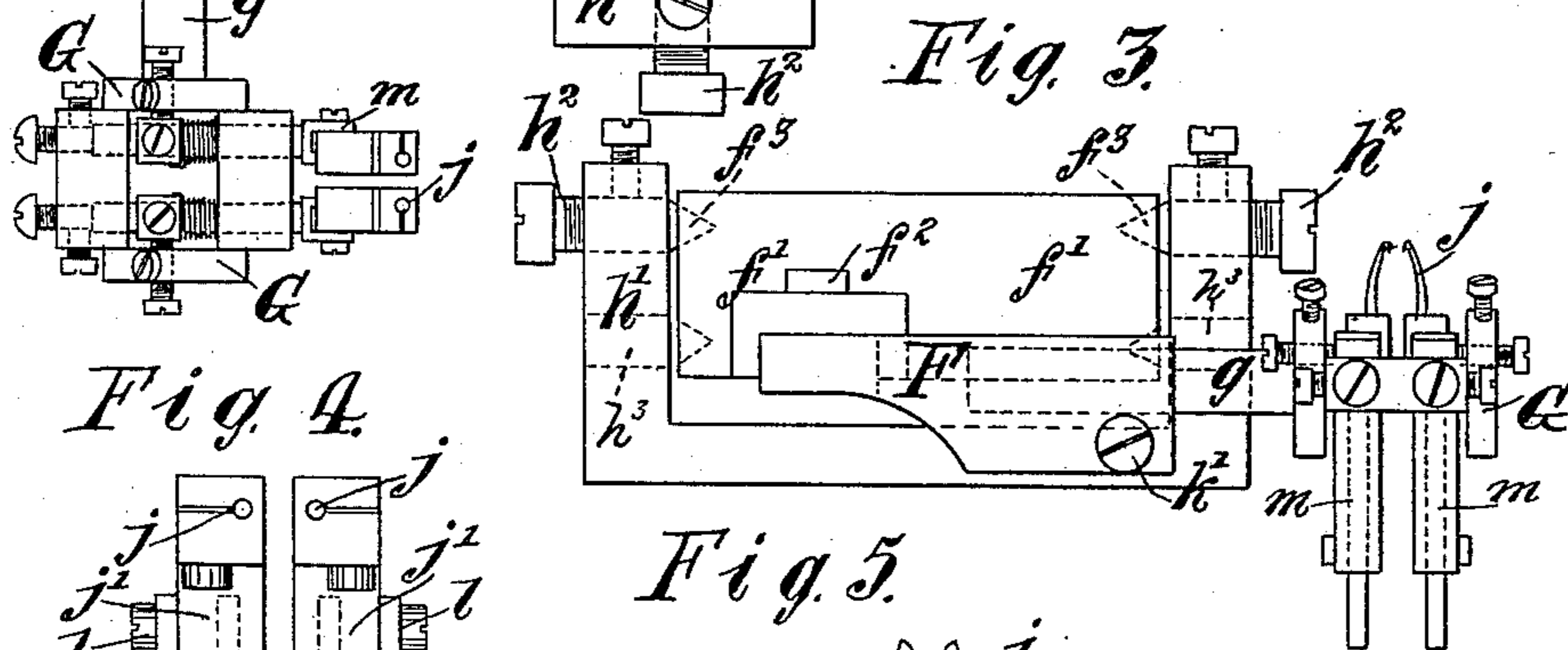
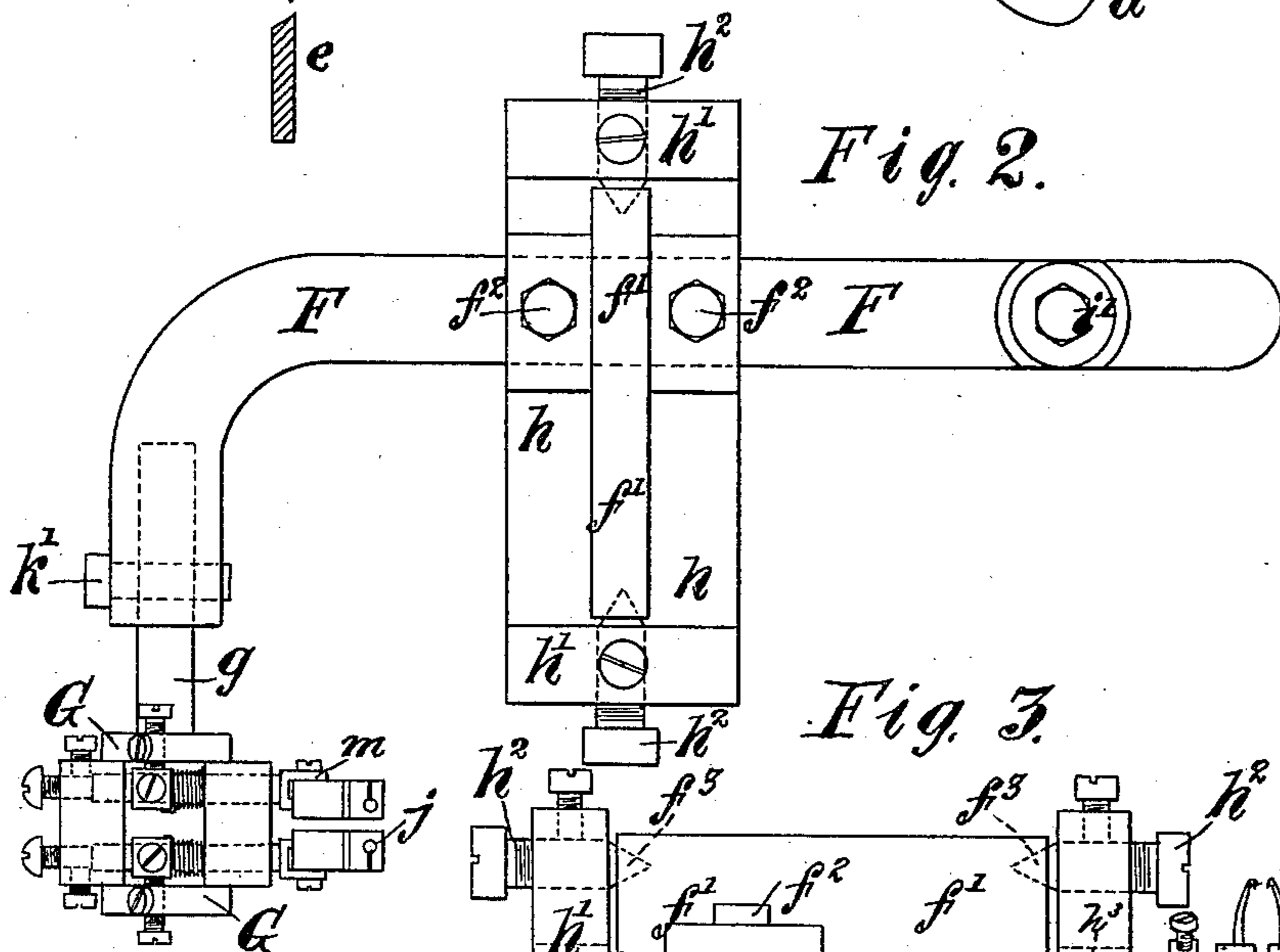
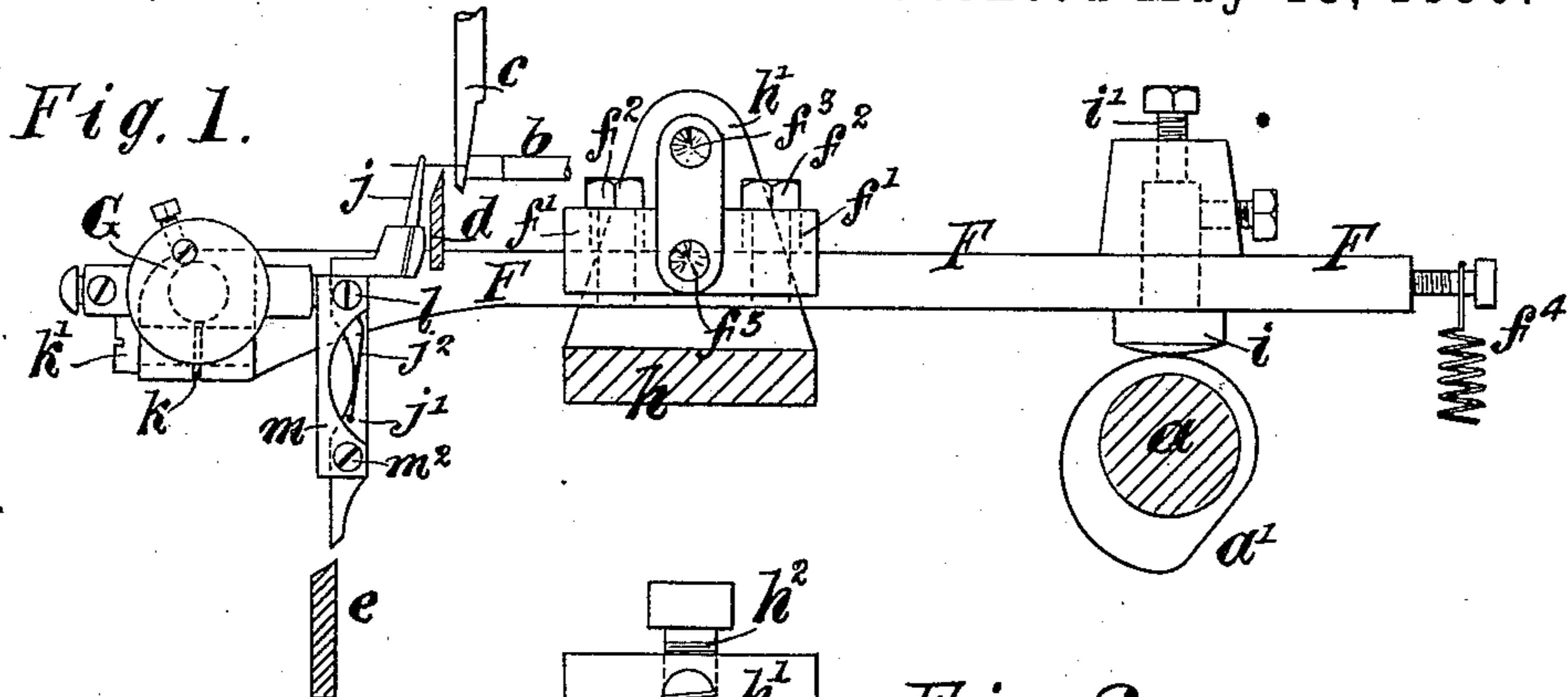
(No Model.)

R. ASHWORTH.

BACK BEND APPARATUS FOR CARD SETTING MACHINES.

No. 427,950.

Patented May 13, 1890.



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ROBERT ASHWORTH, OF PROVIDENCE, RHODE ISLAND.

BACK-BEND APPARATUS FOR CARD-SETTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 427,950, dated May 13, 1890.

Application filed January 21, 1890. Serial No. 337,647. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ASHWORTH, a citizen of the United States of America, residing at Providence, Rhode Island, have invented certain Improvements in the Back-Bend Apparatus for Card-Setting Machines, of which the following is a specification.

In the ordinary card-setting machine, which is used in the manufacture of the wire cards employed in the carding of textile materials, a severed length of wire is seized by the "crown" and bent into the form of a staple with the aid of the "doubler" and of side pressers, which are advanced and push inward the two ends of the wire. This staple is then thrust through the foundation fabric of the card by an advance movement of the crown which holds the staple. The two limbs of the staple which project from the back of the foundation fabric pass over and about in contact with the upper edge of a fixed bar, termed the "back-rest." All these parts and actions are common to all ordinary card-setting machines and are well known. The parts to which my invention relates now come into action. The two ends of the staple which pass over the said back-rest enter within two hooks, termed "back-dies" or "crookers," which are carried by the back-bend. In the ordinary machine the back-bend is in the form of a swing-frame, which rocks upon centers which are carried by a bracket secured to the back of the machine. The said swing-frame is rocked by means of a connecting-rod which is connected with a lever which receives motion from the cam-shaft. The said swing-frame, being very heavy and not being directly acted upon by the cam-shaft, does not work well at high speeds. The means adopted for adjusting the back-dies render the necessarily delicate adjustment of the parts very difficult.

The object of my invention is to remedy these defects. I carry the back-bend by means of a rock-arm, which is mounted in centers carried on the front part of the machine, so that the action of the cam is direct upon the bend. I also improve the arrangements for carrying and adjusting the back-dies.

I will describe my invention with reference to the drawings.

Figure 1 is a side view of the improved back-bend with its arm, and shows in section the cam-shaft of the ordinary card-setting machine. Fig. 2 is a plan of the said back-bend and arm. Fig. 3 is a back end view of the same. Fig. 4, partly in section, is a plan of the back-bend alone. Fig. 5 is a back view of the same. Fig. 6 represents a cross-section of the lower end of one of the heads which carry the back-dies or doublers.

In Fig. 1 *a* is the cam-shaft. *b* is the crown, which holds the length of wire. *c* is the doubler, which descends in front of the wire preparatory to the wire being bent into a staple, and *d* is the back-rest, upon which the limbs of the staple are bent, these parts being the same as in the ordinary machine. A stop-motion finger *e* has also been used prior to my invention. The improved back-bend and arm consists of a lever-arm *F*, carrying the back-bend *G*. The arm *F* is attached to a saddle *f'*, which is mounted in a bracket *h*, which is secured to the bed of the card-setting machine. The said bracket is formed with two vertical limbs *h'*, which carry screw-centers *h²*. In Fig. 1 one of these limbs is removed to show the saddle *f'*. The said saddle is formed with a recess on the under side to receive the arm *F*, which is fitted to the said recess, and is secured in position by means of screws *f²*. The holes in the saddle for the said screws are slotted, in order that the arm *F* may be adjusted lengthwise on the saddle. The center points of the screws *h²* enter conical holes in the two ends of the saddle, so that the saddle, and with it the parts *F* and *G*, can rock on the said centers.

In Figs. 1 and 3 it will be seen that two center holes *f³* *f³* are formed in each end of the saddle, and in Fig. 3 it will be seen that two corresponding tapped screw-holes are formed in the bracket at *h³*. The object of this is to vary the action of the bend, as will be mentioned hereinafter. The arm *F* is formed with a socket to receive the shank of a steel stud *i*, upon which the cam *a'* acts as the shaft *a* revolves. As the head of this stud and the cam become reduced by wear the stud can be set up by means of a screw *i'*. This provision for setting up may be dis-

pensed with. A spiral spring f^4 keeps the head of the stud i in contact with the cam. The back-bend G is provided with two ordinary back-dies or doublers j . It will be seen
 5 that when the stud i is lifted by the action of the cam the said back-dies will be depressed, the arm swinging upon the centers h^2 . This depression of the back-dies has the effect of bending down the limbs of the wire
 10 staple upon the edge of the back-rest d , as is usual. When using tempered-steel wire, which does not bend so readily as iron wire, I work with the centers in the top holes in the saddle. This has the effect of causing
 15 the back-dies to move a little nearer to the back-rest as they bend down the limbs of the staple, so that a better set is given to the wire. In the ordinary arrangement the back-dies move away from the back-rest in the bending
 20 operation. The lower centers are intended to be used for iron wire. If considered to be sufficient, only one set of centers may be provided.

The back-bend G is formed with a cylindrical shank g , which fits a socket bored in the
 25 end of the arm F. One side of this socket is slit, as seen at k in Fig. 1, and a screw k' passes through the two sides, which are separated by this slit. The back-bend can be ad-
 30 justed by sliding the shank in the socket or by turning it upon its axis therein, and when adjusted be securely clamped by tightening the screw k' .

The back-dies j are each secured in the upper end of a back-die lever j' . Each lever is
 35 hinged at l to a head m , which is formed upon a spindle m' , which is fitted in sockets bored in two blocks g' g^2 , which are connected by two disks g^3 , the parts g , g' , g^2 , and g^3 being
 40 formed in one piece, which is centered, so that the parts g g^3 can be turned in the lathe. Each lever j' fits between two cheeks in a recess formed in the head m , as indicated by
 45 Fig. 6, which represents a cross-section of the lower end of one of the heads m . A screw m^2 passes through the two cheeks of the head and through a slot in the lever j' , the said slot
 50 permitting the lever to swing to a slight extent upon the upper center at l . A light spring j^2 tends to keep the lever up against the back of the recess; but the resistance offered by the limbs of the staple to the bending is sufficient to overcome the said spring and to move the lever j' outward and away from the
 55 back of the recess in m to the slight extent permitted by the screw m^2 . Such movement prevents the lower end of the lever j' from striking the stop-finger e ; but in the event of a staple not being passed through the fabric
 60 the said lever strikes the finger e , which acts upon the parts which arrest the movements of the machine, as is usual. This stopping of the machine forms no part of my invention; but I consider the manner in which the lever
 65 j' is mounted to be novel. Each spindle m'

is free to turn in its sockets, as well as to slide therein. These movements are restrained by means of a spiral spring m^3 , which is compressed between the block g' and a finger n , which is upon the spindle m' , the spring being
 70 also secured by its ends to the two parts and applied so as to have a torsional resistance. The effect of the springs in both cases is by expansive effort to keep the back ends of the spindles in contact with set-screws o o in the
 75 block g^2 and by torsional effort to keep each finger n in contact with the end of a set-screw p in the disk g^3 . It will be seen that by turning the screws o the two back-dies can be ad-
 80 justed with relation to the back-rest d , and by turning the screws p the upper hooked ends can be set closer together or farther apart, as required, to suit the size of staple to be formed, the last-named adjustment being ef-
 85 fected by the turning of the spindles m' in their sockets. The resistances of the two spiral springs by keeping the parts in close contact with the ends of the screws o and p prevent backlash, so that the parts answer
 90 at once to the turning of the screws in either direction, and a delicate adjustment can be obtained without difficulty or loss of time.

Having fully described my invention, I add, in conclusion, that I claim—

1. The combination of the frame and back-
 95 rest of a card-setting machine and an operating-cam with an arm F, pivoted to the frame and acted on by the said cam, and a back-bend G, carried by the arm, all substantially as described.

2. The combination of the frame and back-
 100 rest of a card-setting machine and an operating-cam with an arm F, carrying the back-bend and having a wearing-face for the cam, a saddle on the arm, pivoting centers on
 105 which the saddle swings, and a spring to keep the said wearing-face on the arm in contact with the cam.

3. The combination of the frame and back-
 110 rest of a card-setting machine with an arm, the back-bend carried by the arm, a saddle on the said arm having two sets of center holes, a bracket on the frame having corresponding center holes, removable centers, and a cam to act on the arm, all substantially as
 115 described.

4. The combination of the frame and back-
 120 rest of a card-setting machine, the crown and doublers with the back-bend, spindles adapted to turn and slide in sockets in the bend and carrying levers, doublers mounted on the said levers, springs acting upon the spindles to turn and move them forward, and adjusting-screws to act upon the spindles in op-
 125 position to the springs, all substantially as described.

5. The combination of the frame and back-
 130 rest of a card-setting machine with an arm, the back-bend carried thereby, consisting of a shank fitted in a socket in the arm, two op-

posite disks and blocks $g' g^2$, with spindles carrying levers j' , and doublers mounted on the levers, all substantially as described.

6. The combination of the frame and back-
5 rest of a card-setting machine with a back-bend, spindles therein having heads m , levers j' , carrying the doublers and pivoted in said heads, springs acting upon the said le-

vers, and screws to limit their movement, all substantially as set forth. 10

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

ROBERT ASHWORTH.

Witnesses:

J. ENTWISLE,

EDWARD L. DUTTON.