

G. F. LAWRENCE.
KNIFE POLISHING MACHINE.
APPLICATION FILED APR. 25, 1910.

976,189.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 1.

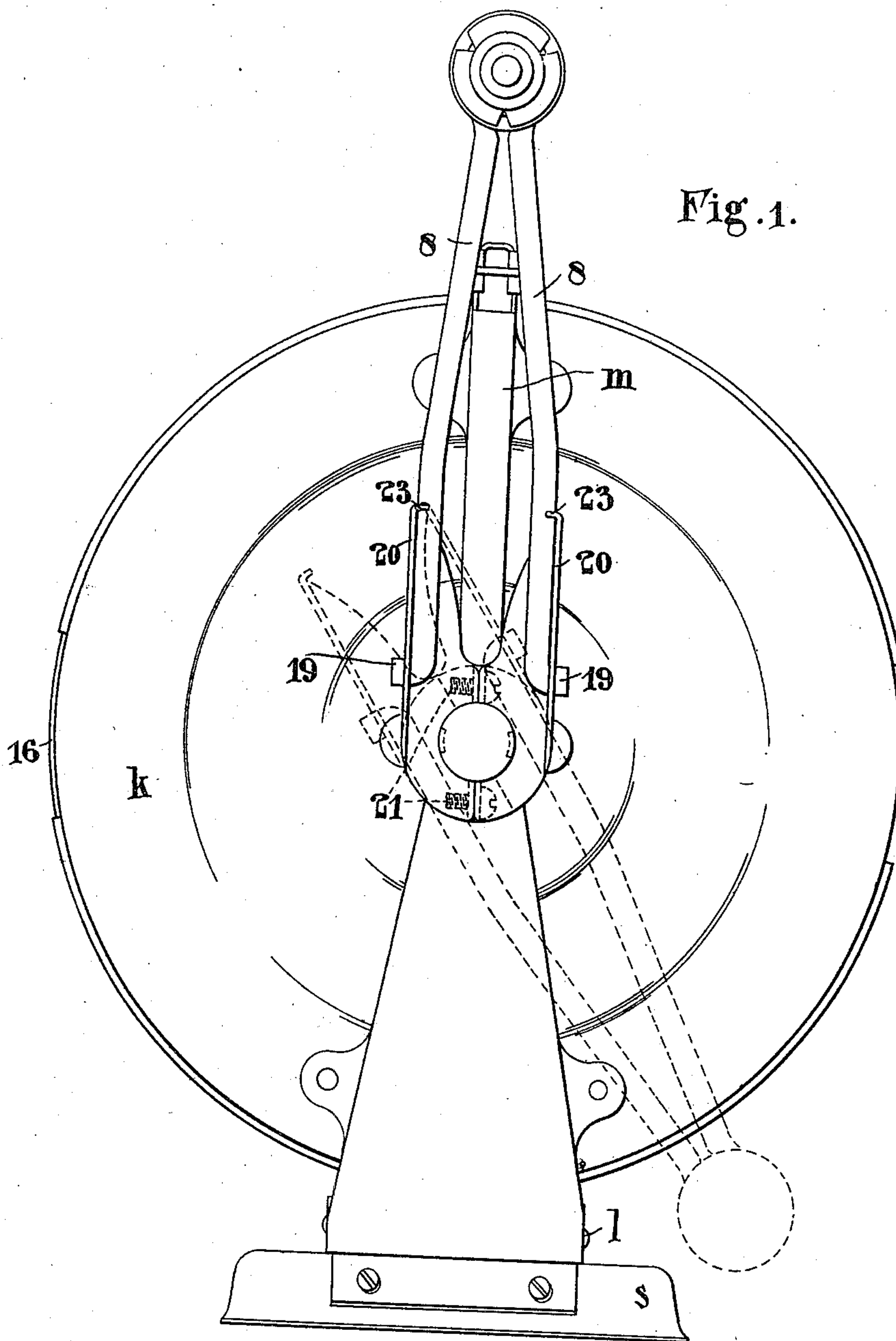


Fig. 1.

Witnesses:
C. H. Potter.
C. Daniels

George Frederick Lawrence,
Inventor,
by Rogers, Townsend & Sprickman,
Attorneys.

G. F. LAWRENCE.
KNIFE POLISHING MACHINE.
APPLICATION FILED APR. 25, 1910.

976,189.

Patented Nov. 22, 1910.

4 SHEETS-SHEET 2.

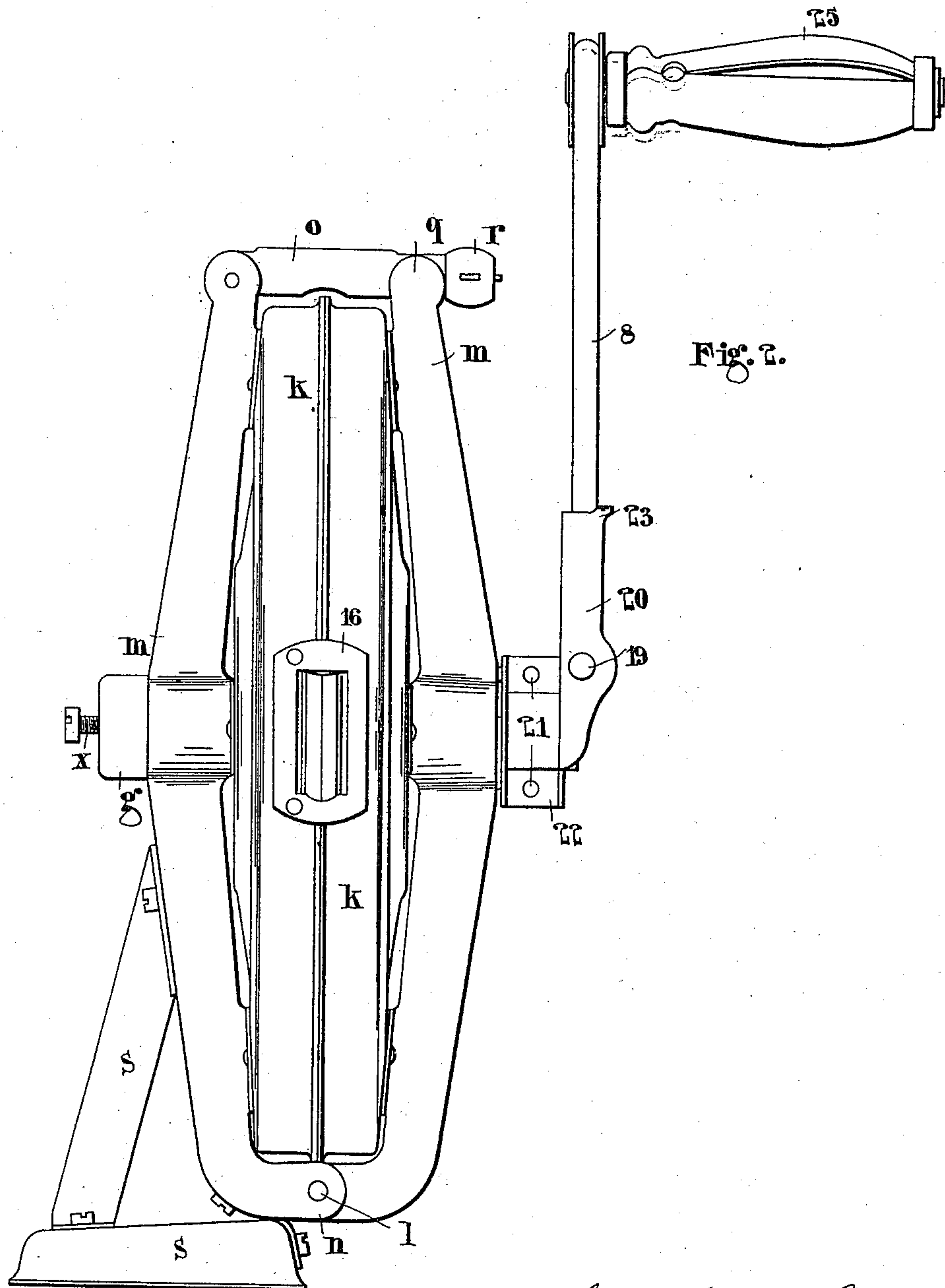


Fig. 2.

Witness:
C. H. Potter.
C. Daniels

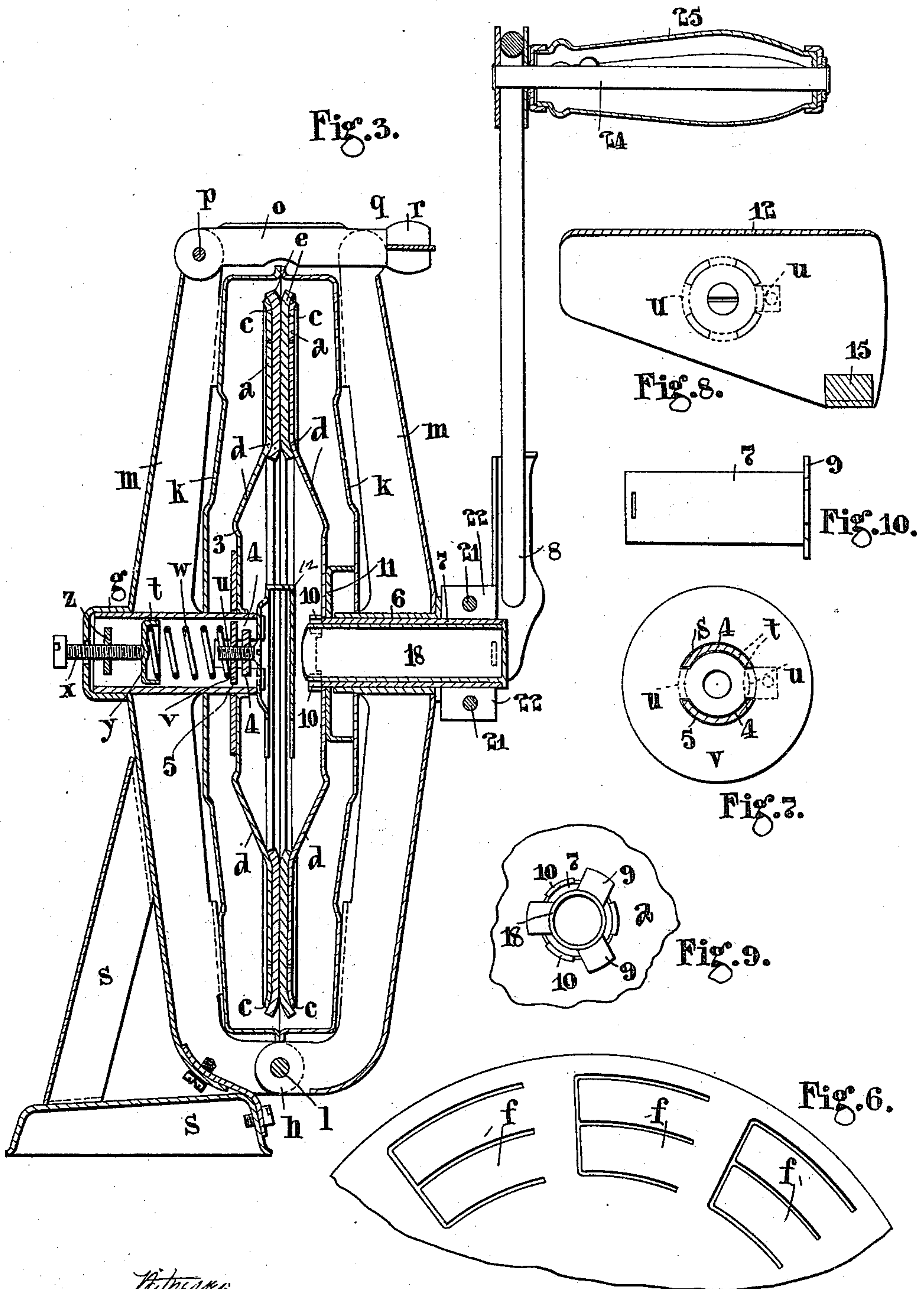
George Frederick Lawrence
Inventor,
by Rogers, Thomas & Pickens,
Attorneys

G. F. LAWRENCE.
KNIFE POLISHING MACHINE.
APPLICATION FILED APR. 25, 1910.

976,189.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 3.



Witness:
C. H. Potter
C. Daniels

George Frederick Lawrence
Inventor,
By Rogers, Townsend & Dickinson,
Attorneys.

G. F. LAWRENCE.
KNIFE POLISHING MACHINE.
APPLICATION FILED APR. 25, 1910.

976,189.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 4.

Fig. 4.

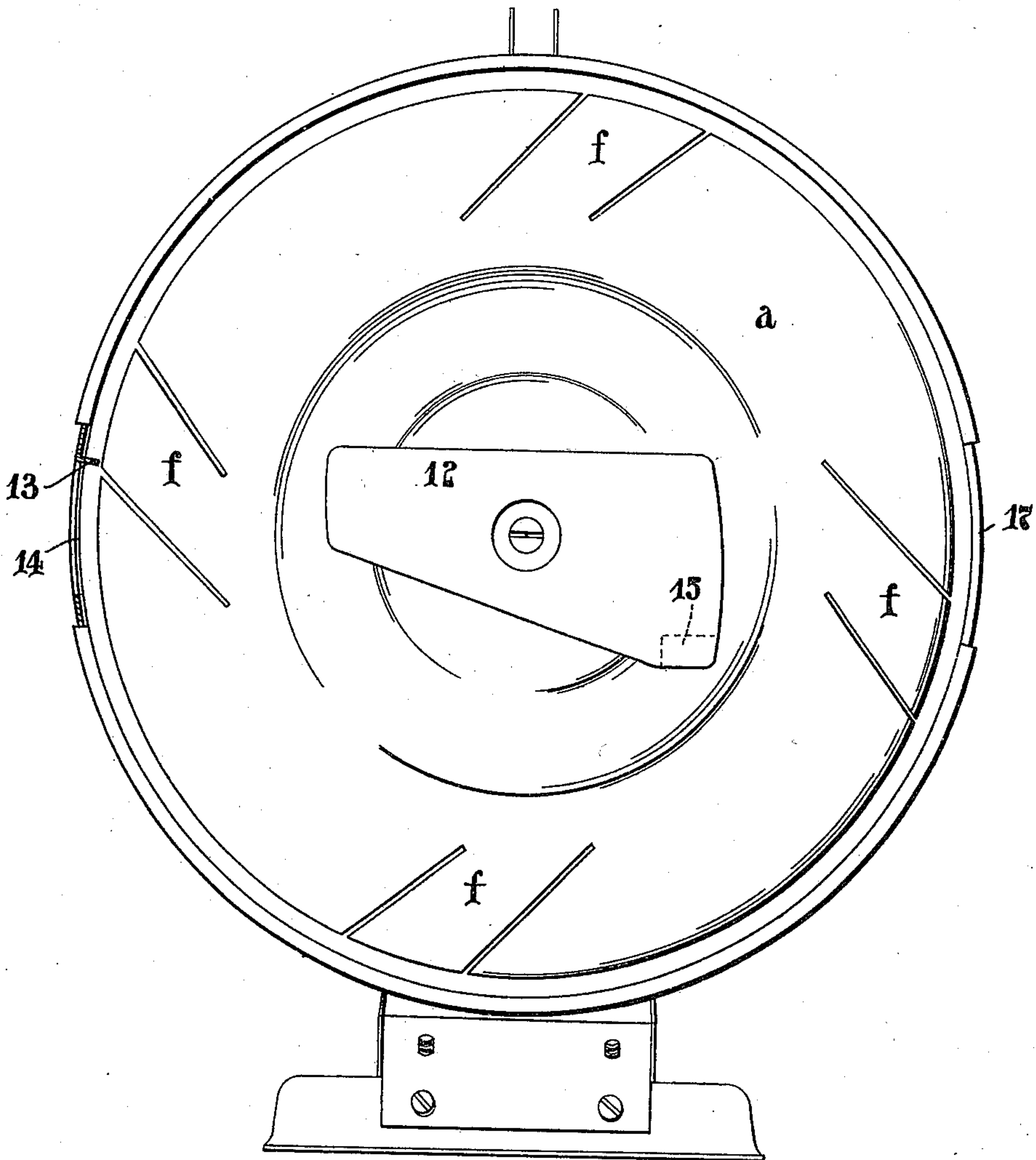
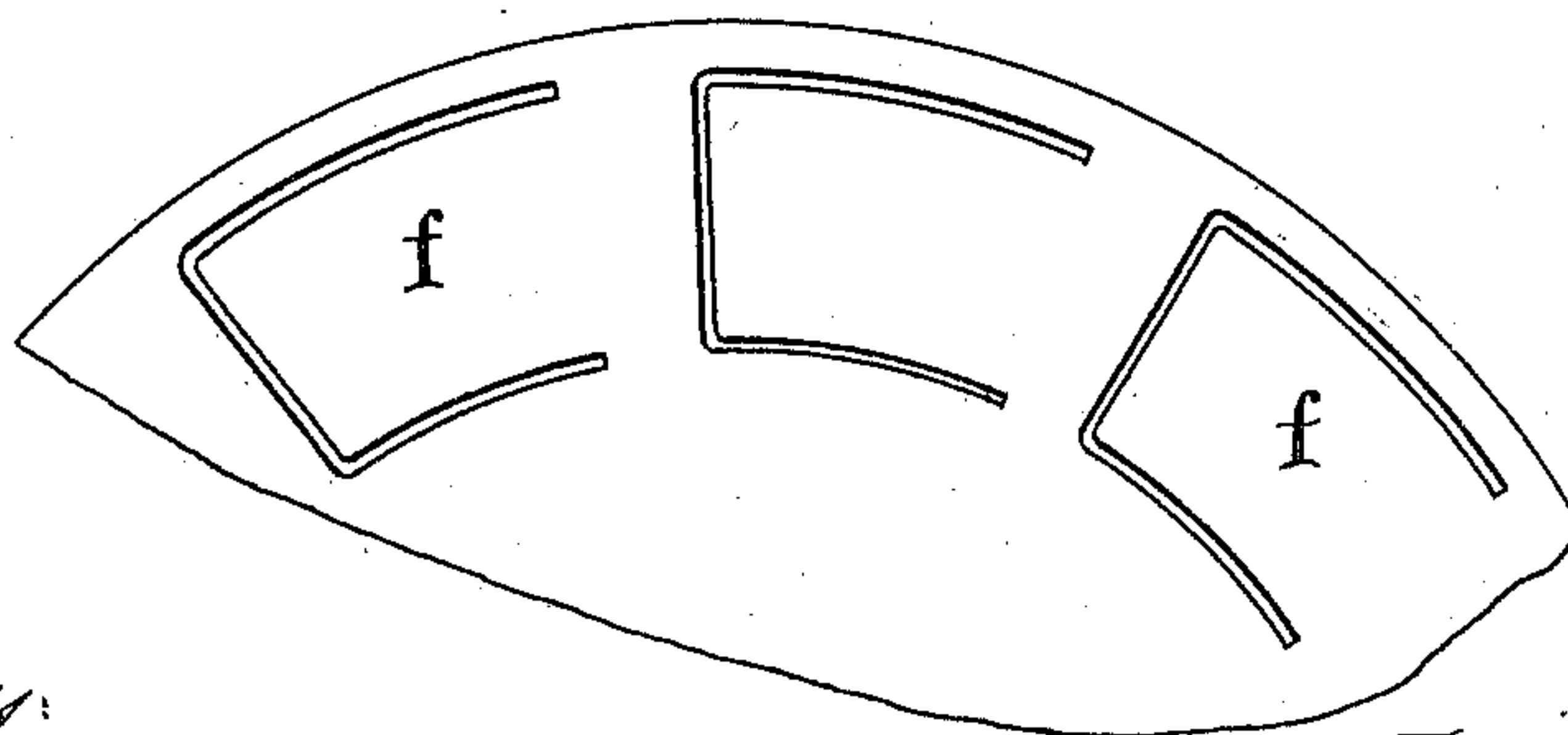


Fig. 5.



Witnesses:
C. H. Potter.
C. Daniels

George Frederick Lawrence,
Inventor,
By Raymond, Townsend & Prichard,
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE FREDERICK LAWRENCE, OF LONDON, ENGLAND, ASSIGNOR OF THREE-FIFTHS
TO JOHN CHAPMAN, OF LONDON, ENGLAND.

KNIFE-POLISHING MACHINE.

976,189.

Specification of Letters Patent.

Patented Nov. 22, 1910.

Application filed April 25, 1910. Serial No. 557,392.

To all whom it may concern:

Be it known that I, GEORGE FREDERICK LAWRENCE, a subject of the King of Great Britain and Ireland, and residing at The Nook, Melrose avenue, Cricklewood, in the county of London, England, have invented certain new and useful Improvements in Knife-Polishing Machines, of which the following is a specification.

This invention relates to knife polishing machines of the type in which the polishing rings are carried on two opposing disks which are dished toward their centers and are slit or notched in order to obtain the necessary resiliency.

The object of the present invention is to provide means whereby the knife which is being polished is firmly supported and is prevented from being damaged.

The invention consists in providing within the space inclosed by the disks, a cantaliver or bracket of channel, girder, flattened tubular or other similar section under or through which the knife is passed, the said cantaliver or bracket being adapted to form a bearing for the knife and it may also be provided with a suitable rest for the knife.

In the accompanying drawings Figures 1 and 2 are respectively side and front elevations of one form of machine according to the invention, Fig. 3 being a transverse elevation. Fig. 4 is a view of one half of the machine showing one of the pressure disks and the central space. Figs. 5 and 6 are detail views illustrating the forms of pressure disk which are employed. Figs. 7, 9 and 10 illustrate details in connection with the fixing of the disks upon their shafts. Fig. 8 shows the internal steady or rest.

In carrying out the invention according to a preferred embodiment two rotary pressure disks *a* are pressed or stamped up from sheet metal. The disks *a* are dished toward their centers so that when they are forced together they form a centrally inclosed space *b* which is utilized for a purpose hereinafter referred to. The disks *a* are formed with comparatively wide flat opposing annular bands near their circumferences, the outer circumferential edges *c* of the disks being bent over or turned over on curves of similar radii, while the inner circumferential edges of the flat bands are beveled or the central dished portions *d* of the disks are

of conical form where they meet the annular bands. Disks *a* are adapted to receive suitable flexible material *e* which is comparatively thin and in the form of rings having curved or beveled outer and inner edges so that the rings *e* conform to the portions of the rotary pressure disks *a* upon which they are mounted and require no fitting, although a projection and slot or other simple device to prevent relative movement between them and the disks may be provided if necessary. The rings *e* may be of ordinary strawboard, leather, felt or any other suitable material and may be molded under pressure in dies and at the same time may be perforated if desired. The perforations may be ultimately filled with a suitable polishing medium which may be mixed with a flexible adhesive or filled in dry.

In order to provide the necessary resiliency to enable the polishing rings *e* or surfaces to conform to the wedge shape of the knife being cleaned, the rotary pressure disks *a* are slit radially and concentrically and the tongues so formed are suitably bent in order to form spring plates *f* as indicated in Fig. 5. When the two rotary pressure disks *a* are pressed together as hereinafter explained the spring plates *f* press upon the flexible rings or surfaces *e* and provide the necessary elasticity, even though comparatively thin polishing rings are used. The spring plates themselves may be slit as indicated in Fig. 6 in order to increase the resiliency if desired.

The rotary pressure disks *a* are arranged within a casing *h* stamped from sheet metal and formed in two parts hinged together at *l* in order that the said parts may be readily separated about the pivot to reveal the two disks *a* and permit of ready renewal of the polishing surfaces or rings *e* as required. Each half of the casing *h* is preferably provided with a stamped sheet metal cross web or girder, *m*, the lower ends of these webs or girders being formed with engaging knuckles or the like *n*, for the pivot pin *l*, while the upper end of one girder is provided with a lever *o* pivoted at *p* and adapted to be sprung between two ears *q* on the other girder *m* so as to form a convenient and efficient fastening device permitting of ready adjustment when required. The end of the lever *o* is provided with a

head *r* adapted to bed against the edges of the ears *q* so as to spring the two girders *m* toward one another in order to secure an efficient closure of the two parts of the casing *k* upon one another. One girder *m* is riveted or otherwise secured to a suitable standard *s* or base which can be screwed or otherwise secured to a table or other support, this standard or base also being preferably stamped from sheet metal although a casting may be used if desired. One girder *m* is provided with a tubular shaft *t* which is stationary and upon which one disk *a* is mounted. The tube *t* is slotted longitudinally at *u* and a washer or slotted disk *v* is threaded upon it. A spring *w* within the tube *t* is adapted to press upon the washer *v*, the spring being in turn rendered adjustable by means of a screw *x* protruding from the outer end of the tube *t* and adapted to act upon a small plate or cup *y* within the tube and against which one end of the spring *w* abuts. The screw *x* is carried by a stationary cross plate *z*, a removable cap *g* being passed over the end of the tube to prevent the ingress or egress of dust. The washer *v* is adapted to press upon the disk *a* which is mounted upon the tube *t*, the washer fitting into a circular recess 3 formed in the boss of said disk. It is also held by lugs 4 preferably formed integrally with the tube *t* and adapted to enter holes 5 in the washer *v*, the lugs for instance being formed from material obtained when forming the slots in the tube *t*. The opposite half of the casing *k* and its corresponding girder *m* are formed with a bearing 6 for a tubular shaft 7 adapted to receive a handle 8 on its outer end, this shaft 7 being preferably provided with three or any other convenient number of radial lugs 9 at its inner end bent at right angles and fitting between projecting lugs 10 on the corresponding disk *a*. The disk *a* which is mounted on shaft 7 preferably bears against a boss 11 which bears against or forms part of the casing *k* or any other fixed part of the machine such as the bearing bush or the girder *m*. This disk *a* is preferably free to rock on the shaft 7 and is kept rotating in a plane by the pressure of the spring *w* acting through the washer *v* on the corresponding disk *a* and thus causing the disk *a* mounted on the shaft 7 to bear against the boss 11. The washer *v* and its corresponding disk *a* are free to rock on the stationary shaft, *t*, the disk being kept in its proper plane by reason of its bearing on the other disk *a* which is maintained in its proper plane by the pressure of the system keeping it bearing on the boss 11 as before described. On the insertion of a knife blade between the disks *a*, the disk *a* on the shaft, *t*, takes up a slightly different plane to allow for the thickness of the blade, by rock-

ing slightly on the shaft *t* and compressing a little further the spring *w*, but the disk *a*, on the shaft 7, still maintains its bearing on the boss 11 and rotates in the same plane.

Antifriction devices may be provided between the boss 11 and its corresponding disk *a* and also between the washer *v* and the other disk *a*, for instance metal balls may run in annular grooves pressed in these parts for the purpose if desired.

When a knife which is being polished extends from the polishing surfaces of one side to those on the other side of the center of rotation it is apt to plunge or reciprocate. In order to avoid this defect an intermediate rest is provided according to the invention, for example a sheet metal rest 12 of flattened tubular form is mounted upon the fixed tubular shaft, *t*, hereinbefore referred to and arranged within the central space *b* formed by the dished rotary polishing disks *a*. The rest 12 is preferably arranged accurately upon a center line of the disks and radially opposite the external rest 13 and the opening 14 in the casing through which the knife is to be inserted; so that when the knife is placed in position to be cleaned it lies upon a radius of the disks, and if a long one, upon a diameter. The rest 12 is adapted to extend as far as possible to the inner circumference of the polishing rings or surfaces *e* so that it forms a support for the back of the knife inserted through the opening 14 whether such knife be a long or short one. In the case of a knife long enough to pass to the polishing surfaces *e* on the opposite side its edge may rest upon a pad 15 of vulcanized fiber or other suitable material fitted upon the rest 12 at the opposite side of the center to which the external rest is situated. By this means a long knife is maintained firmly in position without movement while it is being polished although it is free to be moved radially by the operator if desired to expose different parts of the knife to the polishing surfaces *e* on the rotary pressure disks *a*.

The rest 15 is not absolutely necessary and may be omitted if desired, its function being more that of a safeguard. The rest 12 may be mounted in any other manner than that described, the method of mounting being varied according to the nature of the machine to which it is to be applied, for instance, in a machine where it is not convenient to mount it upon a stationary shaft it may be mounted upon radial arms or supports which may be very thin to enable them to pass between the polishing surfaces *e* so as not to interfere with the action of the latter upon the knives. The rest 13 upon the casing may be conveniently formed by bending in a portion of the metal forming the casing or it may be formed integrally with a plate 16 mounted upon the casing

and reinforcing the same around the slot 14. On the opposite side of the casing another slot 17 is made to allow for the protrusion of the point of a knife when its length requires it.

The polishing powder or like material is, according to the invention inserted through the hollow shaft 7 upon which the handle 8 is mounted, and in order to facilitate the insertion of this powder the hollow shaft 7 is fitted with a tubular receptacle 18 open at its inner end but closed at its outer end and adapted to be easily inserted or removed. This tubular receptacle 18 may be formed as a scoop and when filled with powder may be slid into position in the machine, the powder gradually falling into the space *b* inclosed between the two dished rotary pressure disks *a*. Baffle plates may be introduced to retard the emptying of the powder scoop if desired. The powder falling on to the beveled or conical surfaces *d* of the rotary pressure disks *a* works its way between the polishing surfaces, *e*. If desired the material may be inserted in the form of a cartridge, the inner end of which can be broken off before it is inserted.

The handle 8 may be of stamped sheet metal, but is preferably formed from wire bent into a fork as indicated in Fig. 1, the ends 19 of the fork being bent at right angles and sprung into holes in ears 20 which are clamped upon the shaft 7 by means of screws 21 passed through flanges 22 on semi-cylindrical extensions of the ears 20. The upper ends of the ears 20 are provided with lugs 23 behind which the handle 8 may be sprung and which hold it in position when in use. The upper end of the handle 8 is provided with a stationary pin 24 upon which a rotary handle 25 is mounted. When a machine is to be packed the handle 8 may be sprung from behind the lugs 23 on the ears 20 and then swung down about pivots 19 into the position indicated in dotted lines in Fig. 1 so that the machine may be packed into a smaller compass. Obviously any other form of handle may be used if desired.

From the above description it will be understood that nearly the whole of the machine may be made of stamped or spun metal, thereby greatly reducing the cost of manufacture.

Although in the example described above the machine is only intended to polish one knife at a time, provision may be made in some machines for polishing a number of knives simultaneously.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A knife polishing machine comprising a pair of disks dished toward their centers to form a space, polishing rings attached to

said disks, a bracket extending across the space between said disks, and means for rotating said disks, as set forth.

2. A knife polishing machine comprising a pair of disks dished toward their centers to form a space, polishing rings attached to said disks, a stationary hollow shaft on which one of said disks is mounted, a bracket extending across the space between said disks and mounted on said stationary shaft, and means for rotating said disks, as set forth.

3. A knife polishing machine, comprising a pair of disks dished toward their centers to form a space, polishing rings attached to said disks, a stationary hollow shaft on which one of said disks is mounted, a bracket extending across the space between said disks and mounted on said stationary shaft, an auxiliary rest carried by said bracket, and means for rotating said disks, as set forth.

4. A knife polishing machine comprising a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged casing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, means for allowing the said disk to rock slightly on the hollow shaft, and means for rotating the second disk, as set forth.

5. A knife polishing machine comprising a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged casing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, means for allowing the said disk to rock slightly on the hollow shaft, a second shaft carried by the other part of the casing and carrying the second disk, and means for rotating said shaft, as set forth.

6. A knife polishing machine comprising a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged casing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, means for allowing the said disk to rock slightly on the hollow shaft, a second shaft carried by the other part of the casing and carrying the second disk,

means for allowing the latter disk to rock slightly on its shaft, and means for rotating said shaft, as set forth.

7. A knife polishing machine comprising
5 a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged
10 casing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, a second shaft carried in bear-
15 ings in the other part of the casing, means for rotating said shaft and means for transmitting the motion to the second disk, as set forth.

8. A knife polishing machine comprising
20 a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged cas-
25 ing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, a second shaft carried in bearings in
30 the other part of the casing, lugs formed on said shaft and adapted to engage corresponding lugs on the second disk, and a handle for rotating said shaft, as set forth.

9. A knife polishing machine comprising
35 a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged
40 casing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, a second shaft carried in
45 bearings in the other part of the casing, lugs formed on said shaft and adapted to engage corresponding lugs on the second disk, a boss against which the said disk is adapted to bear, a spring in the hollow shaft sup-
50 porting the first disk and adapted to press the said disk against the second disk, and means for rotating the shaft carrying the second disk, as set forth.

10. A knife polishing machine comprising
55 a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapt-

ed to inclose said disks, a stationary hollow shaft carried by one part of the hinged casing and on which one of the disks is
60 mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, a second hollow shaft through which the polishing powder is adapted to be
65 inserted into the machine, a bearing in the other part of the casing for supporting said hollow shaft, means for rotating said shaft and means for transmitting the motion to the second disk as set forth. 70

11. A knife polishing machine comprising
a pair of disks dished toward their centers so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks a stationary hollow
75 shaft carried by one part of the hinged casing and on which one of the disks is mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to
80 said casing, an auxiliary rest carried by the internal bracket, and means for rotating the second disk, as set forth.

12. A knife polishing machine comprising
a pair of disks dished toward their centers
85 so as to form a space, polishing rings attached to said disks, a hinged casing adapted to inclose said disks, a stationary hollow shaft carried by one part of the hinged casing and on which one of the disks is
90 mounted, a bracket mounted on said hollow shaft and extending across the space between the disks, an external rest attached to said casing, an auxiliary rest carried by the internal bracket, a second hollow shaft
95 through which the polishing powder is adapted to be inserted into the machine, a bearing in the other part of the casing for supporting said hollow shaft, lugs formed on said shaft and adapted to engage corre-
100 sponding lugs on the second disk, a boss against which the said disk is adapted to bear, a spring on the hollow shaft supporting the first disk and adapted to press the said disk against the second disk, and a han-
105 dle for rotating the shaft carrying the second disk, as set forth.

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

GEORGE FREDERICK LAWRENCE.

Witnesses:

W. WARREN TRIGGS,
BERTRAM H. MATTHEWS.