E. RANKIN.

BRAIDING MACHINE.

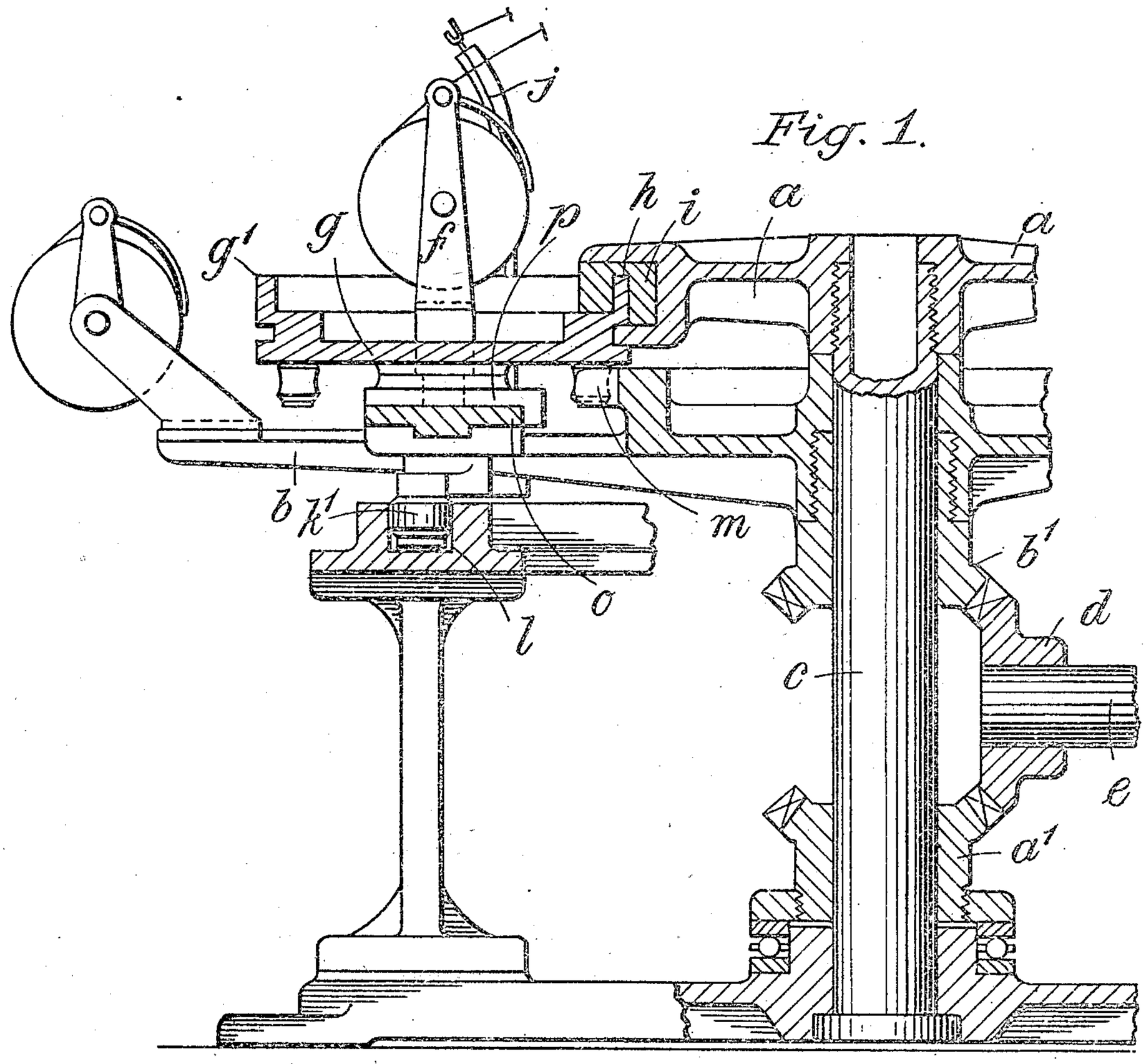
APPLICATION FILED NOV. 11, 1907.

958,175.

Patented May 17, 1910.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

Frederick Cleveland.

Samuel Percival.

Inventor.

Eugene Rankin

by Wheatley & Mackenzie

attorneys.

E. RANKIN.

BRAIDING MACHINE.

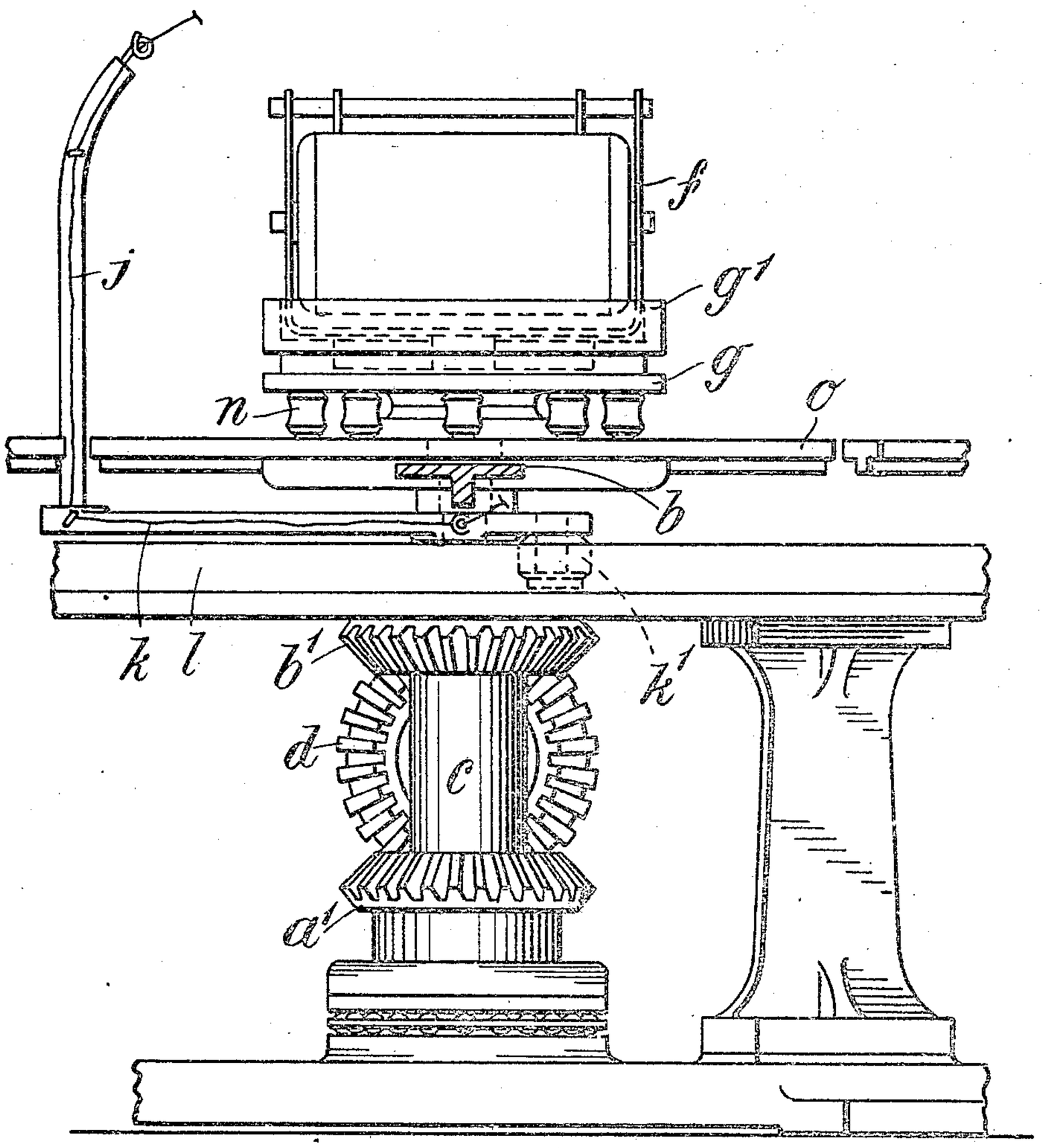
APPLICATION FILED NOV. 11, 1907.

958,175.

Patented May 17, 1910.

5 SHEETS—SHEET 2.

Fig. 2.



Witnesses.
Frederick Cleveland.
Samuel Percival

Inventor.
Eugene Rankin
by Wheatley Mackenzie
Attorneys.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

E. RANKIN.

BRAIDING MACHINE.

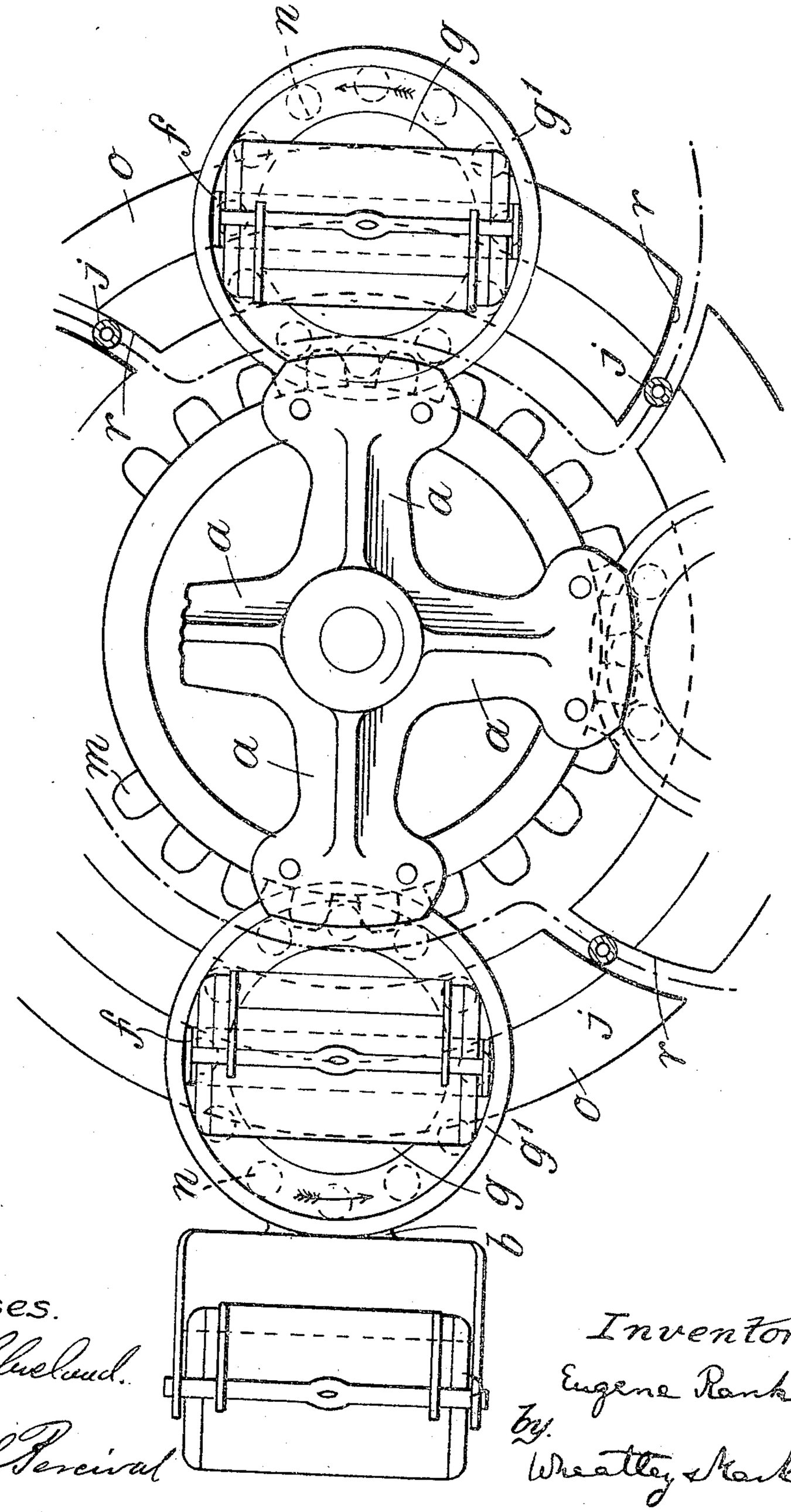
APPLICATION FILED NOV. 11, 1907.

958,175.

Patented May 17, 1910.

5 SHEETS—SHEET 3.

Fig. 3.



Witnesses.

Frederick Cleveland.

Samuel Percival

Inventor.

Eugene Rankin

by.

Wheatley & Mackenzie

Attorneys.

E. RANKIN.

BRAIDING MACHINE.

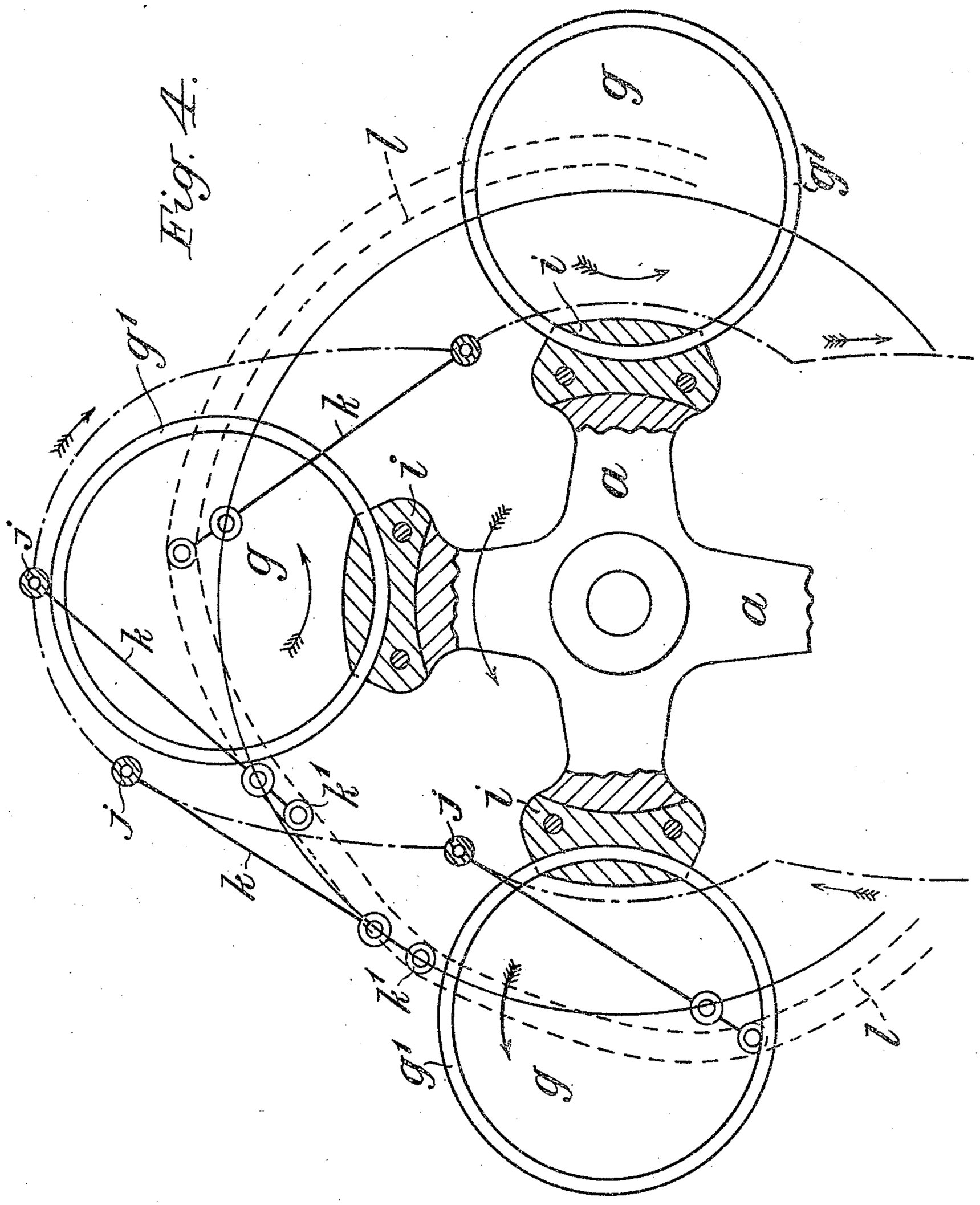
APPLICATION FILED NOV. 11, 1907.

958,175.

Patented May 17, 1910.

5 SHEETS—SHEET 4.

Fig. 4.



Witnesses.
Frederick C. Lueders.
Samuel Percival

Inventor.
Eugene Rankin
By. Wheatley & Mackenzie
attorneys.

E. RANKIN.

BRAIDING MACHINE.

APPLICATION FILED NOV. 11, 1907.

958,175.

Patented May 17, 1910.

5 SHEETS—SHEET 5.

Fig. 5.

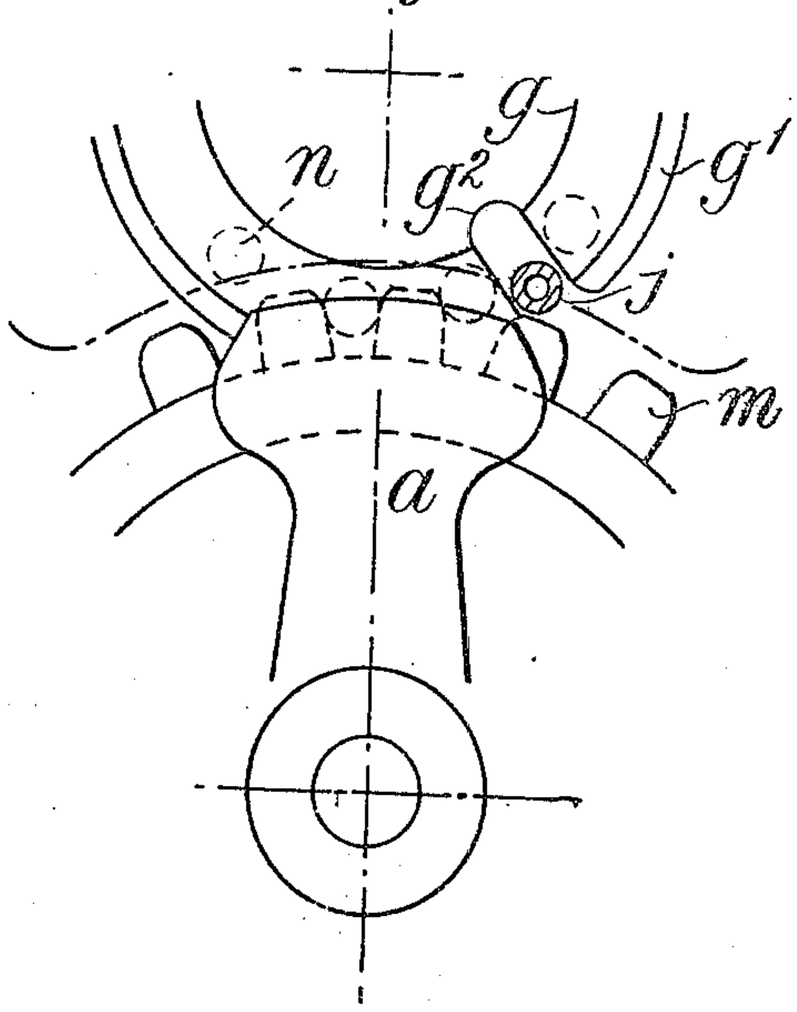


Fig. 6.

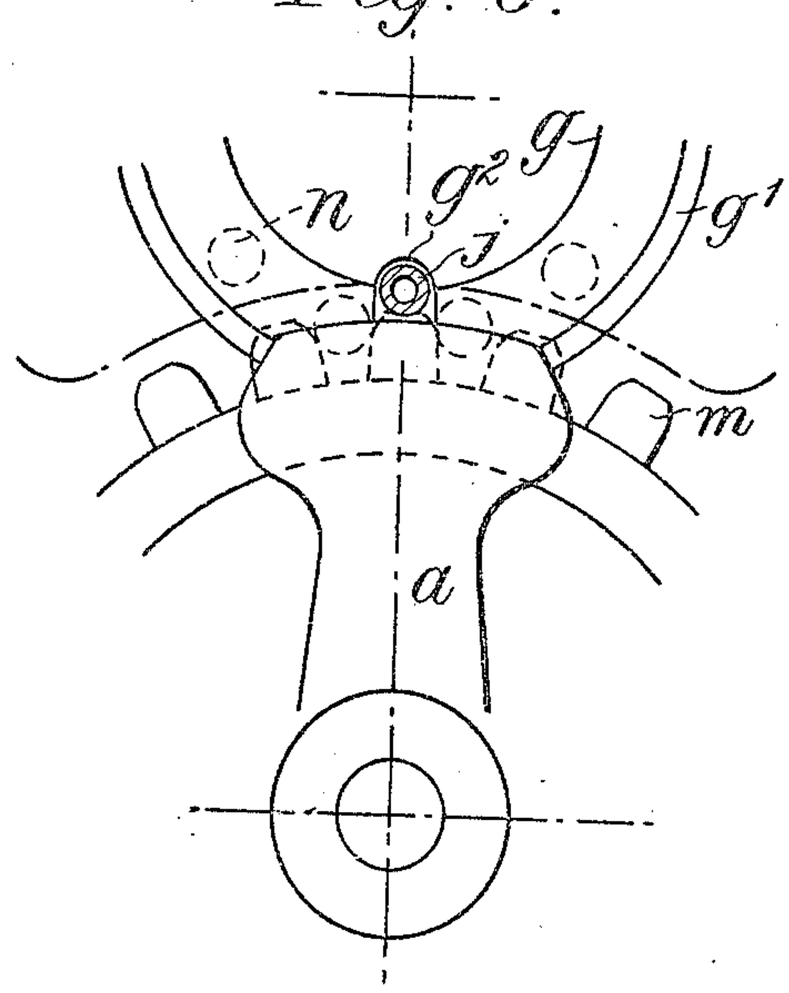


Fig. 7.

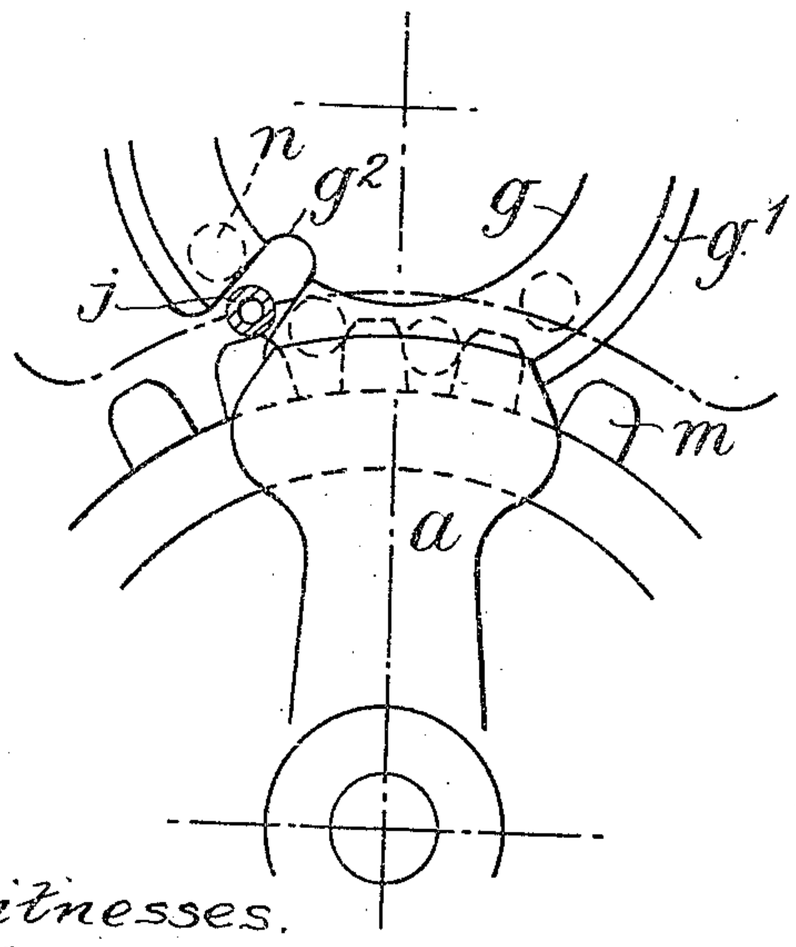
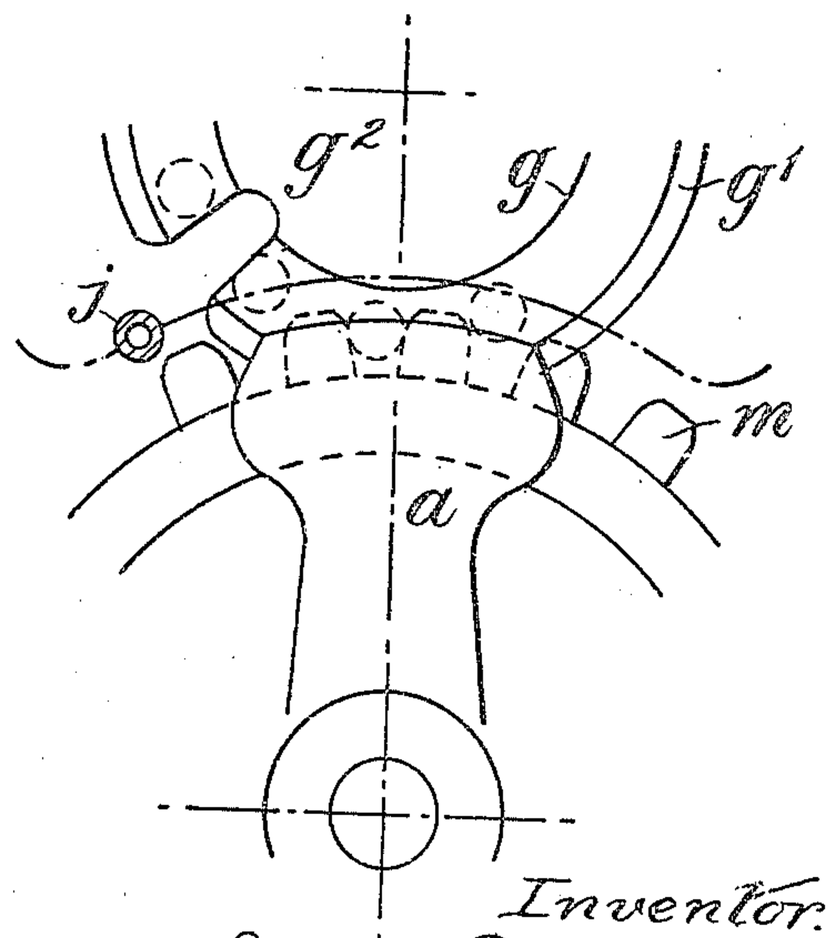


Fig. 8.



Witnesses.

Frederick Cleveland.

Samuel Percival

Inventor.

Eugene Rankin

by Wheatley & Mackenzie

Attorneys.

UNITED STATES PATENT OFFICE.

EUGENE RANKIN, OF LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO GEORGE SPICER, OF KINGSTON-ON-THAMES, ENGLAND.

BRAIDING-MACHINE.

958,175. Specification of Letters Patent. Patented May 17, 1910.

Application filed November 11, 1907. Serial No. 401,731.

To all whom it may concern:

Be it known that I, EUGENE RANKIN, a subject of the King of Great Britain and Ireland, whose post-office address and residence is 17 Portman avenue, East Sheen, London, England, have invented certain new and useful Improvements in Braiding-Machines; 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 for improvements in braiding machines relates to machines in which an inner and outer set of bobbins are rotated in opposite directions and in which the threads from the outer set of bobbins are passed under and over the threads of the inner bobbins and has for its object to simplify the construction of such a machine by supporting both the inner and outer sets of bobbin carriers on an axially mounted spider or table and to effect the passage of the threads by a cam motion so that the pattern can readily be varied by means of interchangeable cams.

In the accompanying sheets of illustrative drawings, Figure 1 is a part section of a machine constructed according to this invention, Fig. 2 is a part front elevation, Fig. 3 is a part plan, Fig. 4 is a diagrammatic view showing the loci of the thread passing arm. Figs. 5, 6, 7 and 8 are detail views showing the respective positions of the thread passing arm in relation to the carrier disk when passing the thread.

In carrying out this invention the two spiders *a b* are mounted coaxially on a central bearing or tube support *c* and are driven in opposite directions by means of the bevel gear wheels *a' b'* respectively which in turn receive their motion from the driving shaft *e* and bevel pinion *d*. The spider *a* is rigidly attached to the central support and revolves with it while the spider *b* and bevel wheel *b'* revolve around it.

The inner bobbin carriers *f* are each mounted on a disk *g* having a circumferential lip *g'* taking into a groove *h* in a block *i* attached by means of screws to the inner spider *a* so that the disks *g* are free to rotate in the spider. The inner bobbin carriers or disk *g* are thus held and mounted by a small portion of their circumference only leaving the other portion free.

A thread passing arm *j* carrying a thread guide is fixed to one end of a lever *k* carried on each of the outer bobbin carrier arms or spiders *b*. The other end of the lever *k* is provided with a roller *k'* working in a cam race or groove *l* fixed on supports carried on the bed of the machine and that as the outer spider or bobbin frame *b* is rotated operates the lever *k* to oscillate the thread arm *j* inward and outward.

The disk carriers *g* are provided with slots g^2 extending from their circumference inward and as the thread arms *j* of the outer bobbins are revolved inward and outward by the cam action the thread guide tubes pass into the slots in the disks *g* and behind the inner bobbin so passing the threads.

As it is not desirable for the guide tubes *j* to rotate the disk carriers *g* in their passage behind the inner bobbins means are provided for positively rotating the disks *g* and in the example shown comprises a gear wheel *m* or rack carried by the outer bobbin spider *b* and engaging a series of rollers *n* or teeth depending from the lower face of the disk carrier. The slots in the disks are so shaped as not to engage the guide tube.

A guide rail *o* is carried on the spider *b* and takes the weight of each disk carrier which is provided with a suitable shaped block or shoe *p* running on the guide rail *o*. To this block or shoe *p* the bobbin carriers *f* are screwed passing through the disk *g* so that while the disk is perfectly free to revolve the bobbin carrier remains stationary. Slots *r* or passages are cut through the guide rail where required for the passage of the thread carrying arm when passing the threads.

The cam operating the thread passing arm is made in two parts so that it can be readily taken out and changed so that for example an eight spindle machine can be readily arranged to give either under and over alternately, two under and two over, or one under and three over.

By the method of mounting the inner bobbins, their size can be considerably increased over the sizes usually employed.

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

1. A braiding machine comprising inner and outer sets of bobbins rotatable in opposite directions, disks having the inner bob-

bins mounted thereon, and supporting means engaging a portion of the peripheries of said disks, whereby said disks are adapted to be rotated.

2. A braiding machine comprising inner and outer sets of bobbins rotated in opposite directions, means for passing the thread comprising rotatable inner bobbin disks provided with slots, a supporting plate having curved grooves engaging a portion of the periphery of each disk, a two part cam on the bed of the machine, and thread carrying arms or levers acting on the outer threads and engaging said cam to move the thread carrying arms inward through the slot in the carrier disk and outward to pass the threads as the disks rotate.

3. A braiding machine comprising two spiders or tables rotated in opposite directions and supporting inner and outer sets of bobbin carriers, toothed disks rotatably mounted by a portion of their peripheries and supporting the inner bobbin carriers and a toothed rim on the outer bobbin spider gearing with the teeth on the inner bobbin disks to rotate the said disks, thread arms guiding the threads of the outer bobbins and means for operating the said arms to pass the threads.

In testimony whereof I have affixed my signature, in presence of two witnesses.

EUGENE RANKIN.

Witnesses:
GEORGE SPICER,
CLEVELAND MORRIS GOODWIN.