

(No Model.)

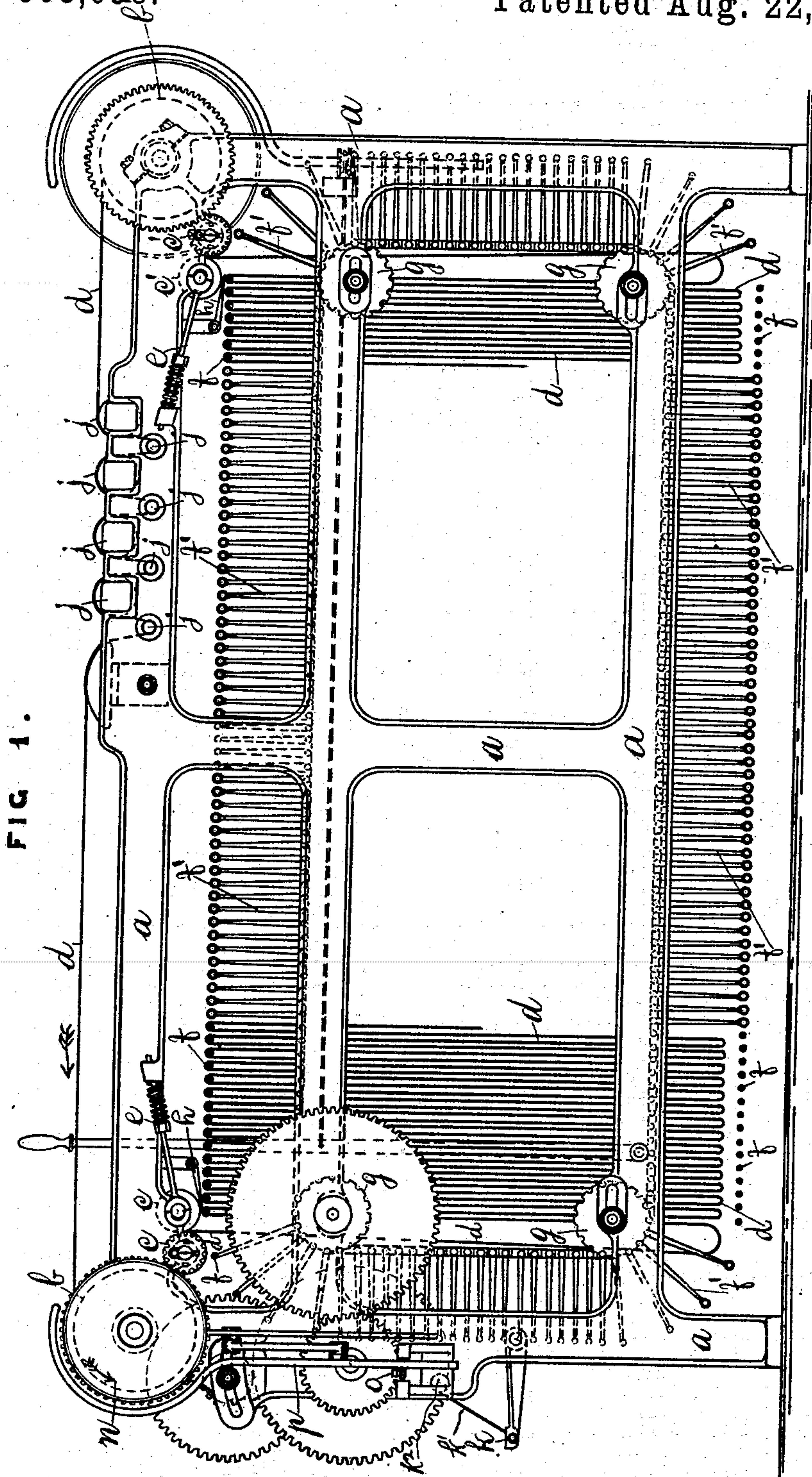
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W. GADD.

MACHINE FOR CUTTING THE PILE OF WEFT PILE FABRICS.

No. 503,658.

Patented Aug. 22, 1893.



Witnesses :  
George Frederick Gadd.  
Arthur Gadd.

Inventor:  
William Qadd.

(No Model.)

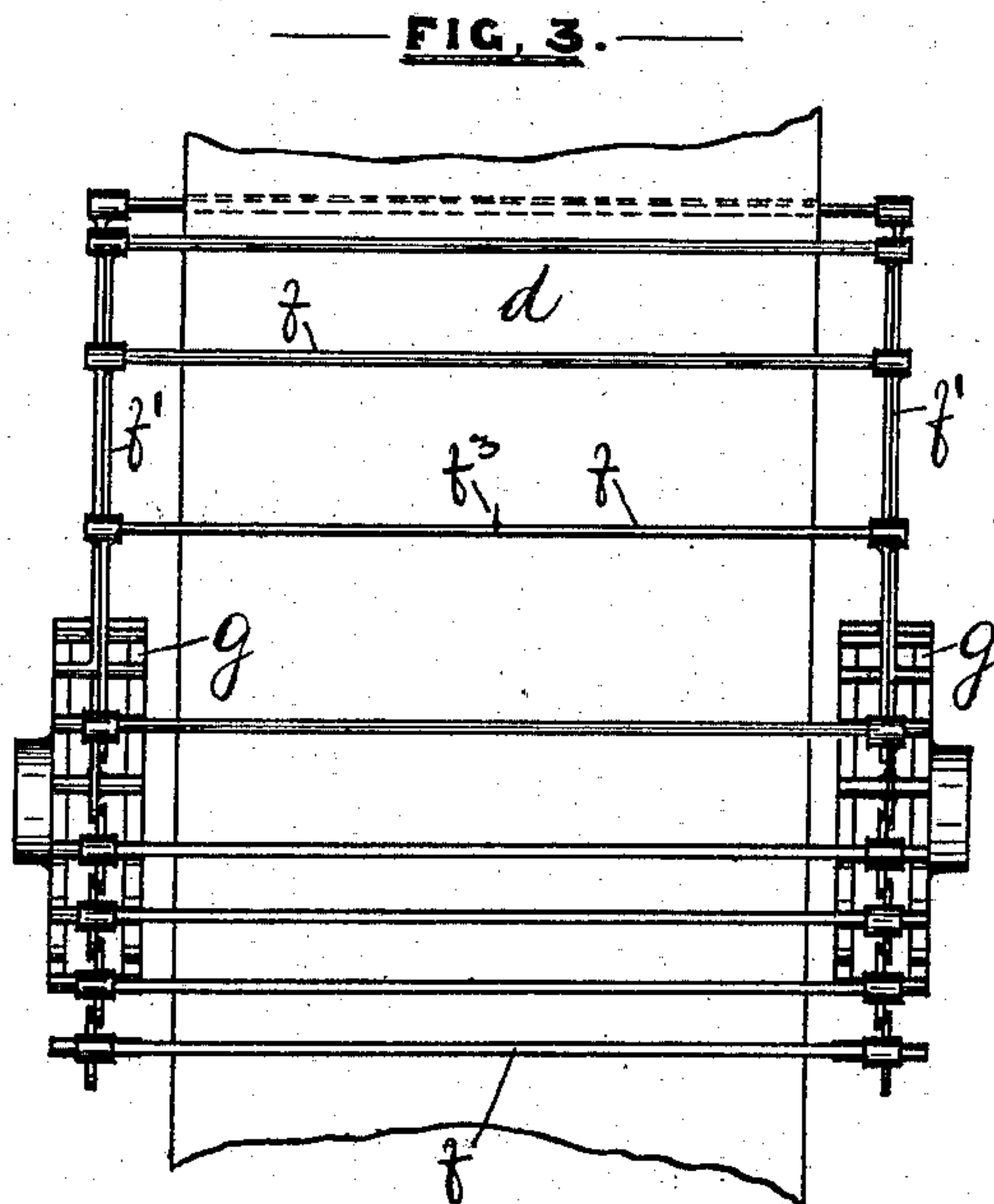
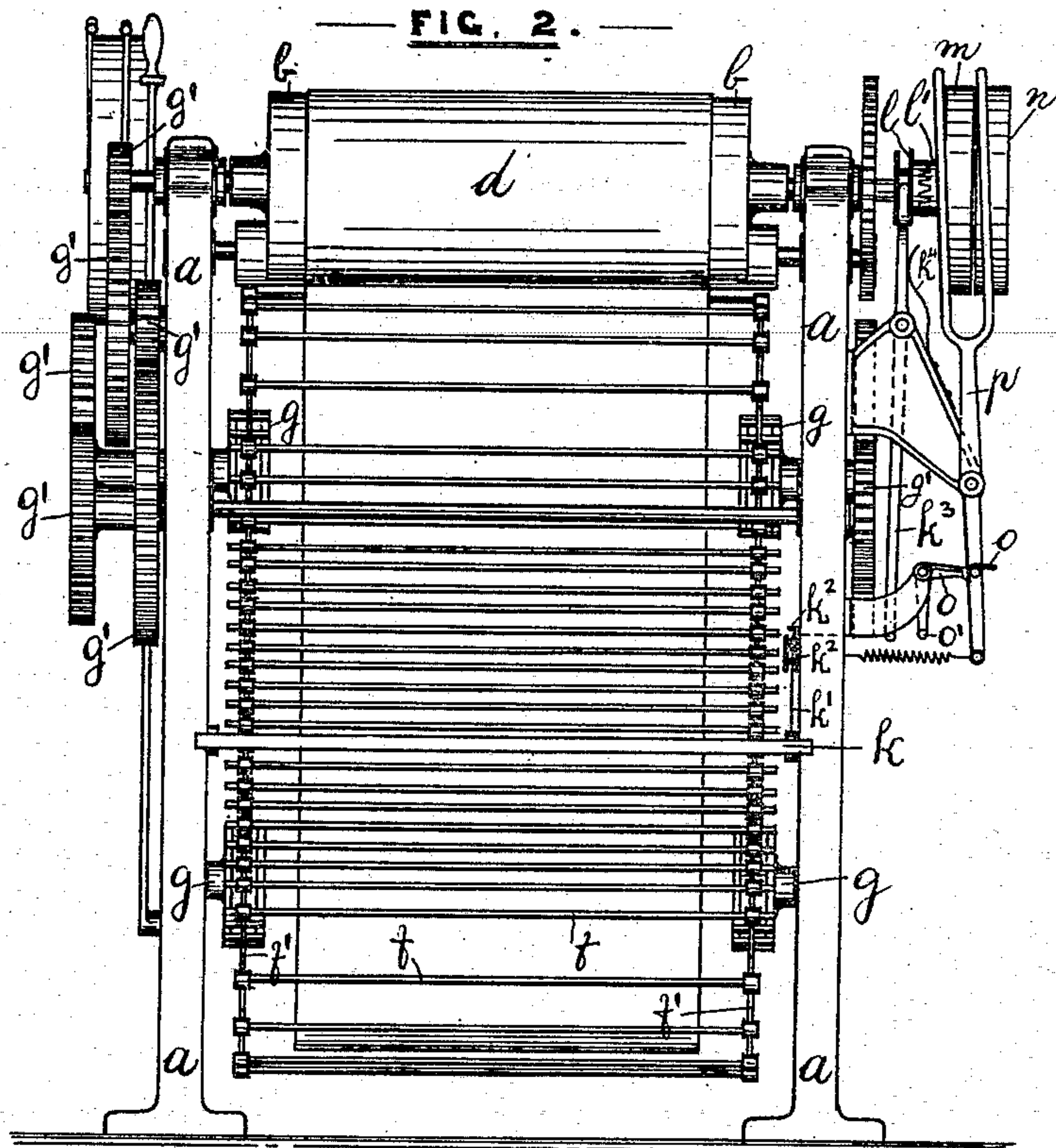
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W. GADD.

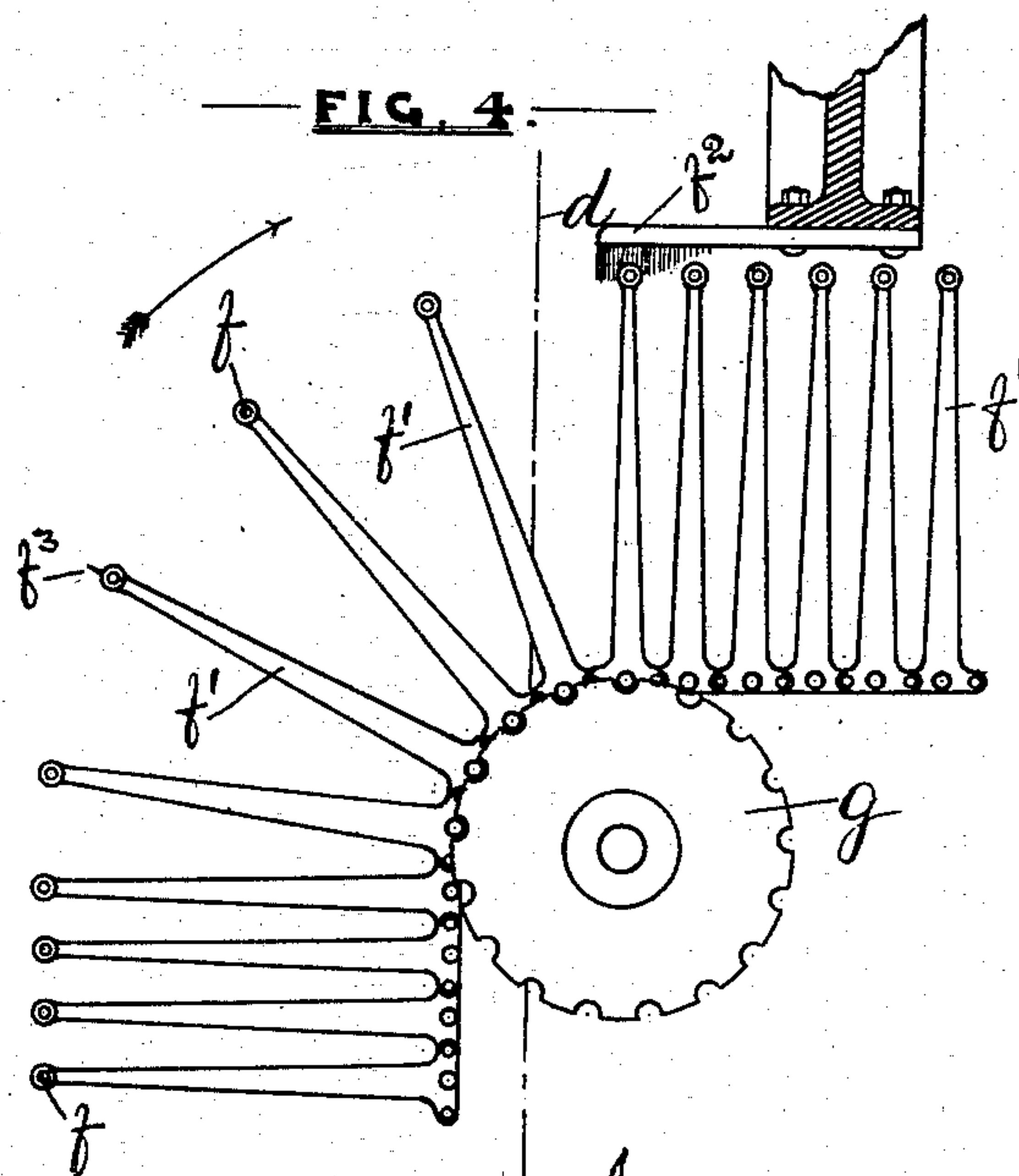
MACHINE FOR CUTTING THE PILE OF WEFT PILE FABRICS.

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Patented Aug. 22, 1893.



Witnesses:  
George Frederick Gadd,  
Ernest Gee



Inventor:  
William Gadd.



# UNITED STATES PATENT OFFICE.

WILLIAM GADD, OF MANCHESTER, ENGLAND.

## MACHINE FOR CUTTING THE PILE OF WEFT PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 503,658, dated August 22, 1893.

Application filed August 5, 1892. Serial No. 442,290. (No model.) Patented in England October 17, 1891, No. 17,760.

*To all whom it may concern:*

Be it known that I, WILLIAM GADD, a subject of the Queen of Great Britain, residing at 64 Barton Arcade, Manchester, in the county of Lancaster, England, have invented new and useful Improvements in Machines for Cutting the Pile of Weft Pile Fabrics or other Machines Employed in Finishing Fabrics, (for which I have obtained Letters Patent in Great Britain, No. 17,760, bearing date October 17, 1891,) of which the following is a specification.

The improvements relate to machines employed in cutting the pile of weft pile fabrics, or other machines employed in finishing fabrics, and have for their objects effecting the travel of the fabric or piece of cloth, to be operated upon, in one continuous direction, against a cutting knife, while disposing, for the time being, of the non-operative portions of the piece of fabric in a convenient and effective manner without undue creasing thereof, or friction thereon. To accomplish this, and to effect the improvements, a convenient framing is provided with suitable journals for a driving roller or rollers, which is or are caused to pull the piece of cloth continuously forward, under the requisite resistance or friction from tension, or geared, or other rollers or bars, or both. By preference, the fabric or cloth is joined at its two ends so as to form an endless web, as is well understood. The intervening portions of the piece of fabric are conveniently and effectively disposed of for the time being underneath the running surface of the fabric undergoing operation, by the following means, which, combined with a drawing forward mechanism, as already described, form the principal portion of the present invention: A linked or other chain or band is formed on each side of the machine, and is carried on wheels or pulleys, or other carriers. These chains are endless and are guided along the top, ends, and bottom portions of the machine, and are formed of or provided with levers projecting radially from the links or bands, in the plane of the motion thereof. The projecting levers of one chain or band are connected by rods to the opposite projecting levers of the other chain or band, and one or more of the driving or carrier wheels for the chains or bands are geared to the driving parts of the machine,

either by star wheel, ratchet and pawl, or other or ordinary continuous gearing, for the purpose of giving the chain of transverse rods a forward motion, which is, in some cases, preferably of an intermittent character, while in others the continuous forward motion is preferable.

Near each end of the machine, where the chains pass over the carriers, the radial rods open out and thus allow the cloth, as it falls from the draw rollers, to fall between them, forming a loop of the required length, when the chain of rods is driven forward, and the next rod comes in front of the constantly falling cloth, thus forming a succession of hanging loops over the rods, which loops, as they present themselves at the other end of the machine, are readily and easily unlooped or drawn straight by the draw rollers, and the operation may be continuously repeated as many times as required.

Although I prefer the chain of traveling rods to be attached to radial levers projecting from endless chains or bands as described, nevertheless a succession of rods may be presented to the falling cloth in various ways which are the equivalents of the foregoing, and for the same purpose. And, also, although the improvements more especially refer to the cutting of the pile of weft pile fabrics they may, with some modifications, be adapted to other operations of an analogous character which are required in the finishing of fabrics of a kindred nature.

The usual forms of driving apparatus may be employed such as strap or other friction driving or clutch gearing; but for convenience of stopping the machine quickly, I prefer to employ a special form of driving apparatus, consisting of a combination of a clutch-gear with a driving strap, and pulleys, in such manner that neither of these will drive the machine without the other; by which means, when the machine is running, the release of the clutch will allow the machine to stop quickly, thus allowing the strap to run off the driving pulley after such stoppage has taken place. But that the invention may be better understood, I will, with the aid of the accompanying drawings, proceed more fully to describe the means employed by me.

In the drawings, Figure 1 shows a side ele-



vation and Fig. 2 a front elevation of a machine arranged in accordance with my improvements; while Fig. 3 shows a front view, and Fig. 4 a side elevation of a detail enlarged.

5 The same letters indicate corresponding parts wherever they occur.

*a, a.* is the main framing of the machine and *b.* is the draw roller forward, while *b'.* is the draw back roller or forward delivery roller. It is in most cases convenient to arrange the apparatus with this capacity of backward motion, but where such is not required it may be dispensed with, and a fixed bar may be substituted for the roller *b'.* The rollers *c. c.* deliver the fabric to the traveling looping rods and the rollers *c' c'* draw the fabric therefrom, and, in the example shown these rollers are driven by one in each case being geared with the draw roller, and the other by friction; but, in the case of light fabrics it may be desirable to drive all the rollers *c. c.* and *c' c'.* by means of friction against the draw rollers *b.* and *b'.* and against one another; but, in most cases, it is preferable to give the rollers *c. c.* and *c' c'.* a slightly quicker forward surface speed than the run of the cloth; and, for heavy fabrics, to roughen the surface of the draw-rollers by any well-known means, so as to prevent slipping of the fabric thereon.

30 *d.* is the fabric, which, in work, passes over the draw roller *b.* partly round the same, and over the first delivery roller *c.* where it is nipped by the second roller, which has pressure put thereon by means of a spring presser

35 *e. e.*

*e'.* is a rod, provided with a curved end, bearing upon the spindle of each of the second rollers *c* and *c.*, one at each end of such rollers, whereby the second rollers are caused, by the springs surrounding the rods, to press against the first rollers *c.* and *c'.* From these nip-rollers the cloth falls by its own gravity between a pair of the transverse rods *f. f'.* These rods are carried on the ends of levers *f' f'.* the other ends of which are linked together as two endless chains passing round the four pulleys *g. g.* on each side of the machine. One or more of these pulleys on each side carrying the chain of levers is geared by any suitable gearing *g'* with the draw rollers so as to cause the chain of levers to travel forward either continuously, by means of continuous gearing, or intermittently by means of any intermittent gearing.

55 When a transverse rod over which the fabric is looped arrives underneath the small clip or presser *h. h.* the gravitational fall of the cloth is arrested, and thus a new loop is formed, and the operation may be continuously repeated.

60 *h.* is a weighted or other clip or presser, which rests or presses upon the transverse rods, one by one, as they present themselves thereto.

65 It will be seen that the chain of levers, by passing over the pulleys *g. g.* fringe or open out at those points, and so give room for the

fabric to fall in a loop between them. For convenience the chain of levers, while traveling horizontally, rests on bars or rails at each side of the machine.

*j. j.* are tension bars and rollers, over and underneath some, or all of which, the cloth may pass to give the requisite strain or stretch thereto for the operation of cutting the pile, which may be accomplished by any suitable knife of the ordinary or other character, by preference held in the hand of the operator, and applied to the fabric at any convenient part of the running surface between the front draw-roller *b.* and the nearest of the tension bars *j.*

As each loop of the fabric arrives at the back end of the machine it is drawn up through the nip rollers *c', c'.* and over the roller *b'.* by the run of the cloth, and it will be seen that the fabric has been disposed of, in the interim, within the machine, by means of hanging loops, without pressure or creasing during the process.

In the cutting of weft pile fabrics by machinery, it is important to be able to stop the machine instantly, or as quickly as may be, for the prevention of accidental damage. To this end we provide a special arrangement of stopping and starting gear, consisting of the joint action of an ordinary interlocking clutch, and ordinary strap driving; but in such manner that neither of these means will alone connect or put the machine in motion, without the assistance of the other. The foot lever *k. k* mounted at the operating end of the machine on being depressed will, by means of the intervening cord *k',* pulleys, *k<sup>2</sup>* and lever, *k<sup>3</sup>* as shown, put the half *l* of the clutch, (which slides on a key upon the shaft of the machine in the usual or other manner,) into gear with the other half *l'.* attached to or forming part of the pulley *m.* which latter, without so being in gear, will run loose, like unto the ordinary loose pulley *n.* That is to say, the pulleys *m.* and *n.* are primarily both of them loose pulleys, so that whether the driving strap be on the one or the other, without further action, the machine will not move. But when the sliding half *l* of the clutch is held in the locked position with the other half upon the pulley *m.* this latter becomes for the time being equivalent to a fast pulley, and remains so as long as such interlocking is preserved. But when the foot lever is released, the spring (or it may be weight) which counteracts the same, withdraws the sliding half of the clutch, when the machine is instantly free of the forward power, and will stop very quickly, as there is little or no accumulated momentum, although a brake may be added if desired. It will be seen that when the connection of parts is thus broken, the driving strap may be liberated and slide on to the loose pulley proper at leisure. *o. o.* show a trip catch to hold on the strap lever *p.* while the clutch is in gear, but which is released in the following manner whenever the



clutch is allowed to go out of gear: On the  
cord  $k'$  being freed from tension, the clutch-  
lever spring  $k^4$  presses the clutch out of gear,  
and pushes the lower end of the clutch lever  
5  $k^3$  against the leg  $o'$  of the trip catch  $o$ , forc-  
ibly raising such catch out of contact with the  
strap-lever  $p$ , whose spring will then be en-  
abled to come into operation. A separate  
driving strap is shown for the forward and  
10 backward driving.

Instead of the clip levers  $h$ .  $h$ . being used,  
a small fixed brush  $f^2$  may be employed, or  
other means for arresting the gravitational  
fall of the cloth at the right time, such as one  
15 or more small sharp spikes  $f^3$  upon each trans-  
verse rod, and other variations in detail may  
be made without departing from the peculiar  
character of the invention.

Having now particularly described and as-  
certained the nature of my said invention and 20  
in what manner the same is to be performed,  
I declare that what I claim is—

In machines employed in cutting the pile  
of weft pile fabrics, or for analogous pur-  
poses, the endless chain of levers  $f'$ , the trans- 25  
verse rods  $f$ . carried thereby, the geared pul-  
leys  $g$ , actuating the levers, and causing the  
same to open out at those points where they  
pass round the said pulleys; for the purpose  
and in manner substantially as herein shown 30  
and described.

WILLIAM GADD.

Witnesses:

GEORGE FREDERICK GADD,  
ARTHUR GADD.