

No. 767,141.

PATENTED AUG. 9, 1904.

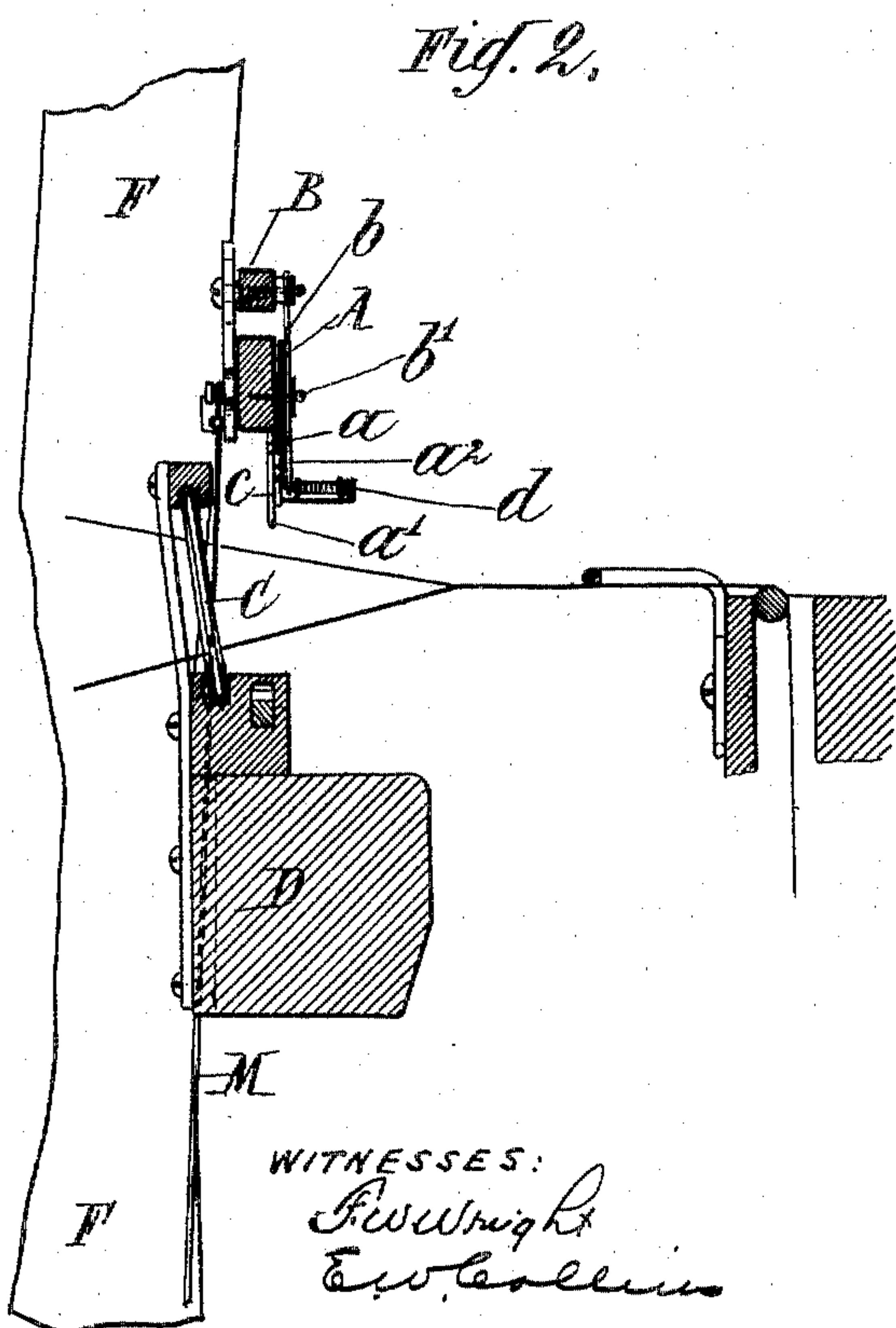
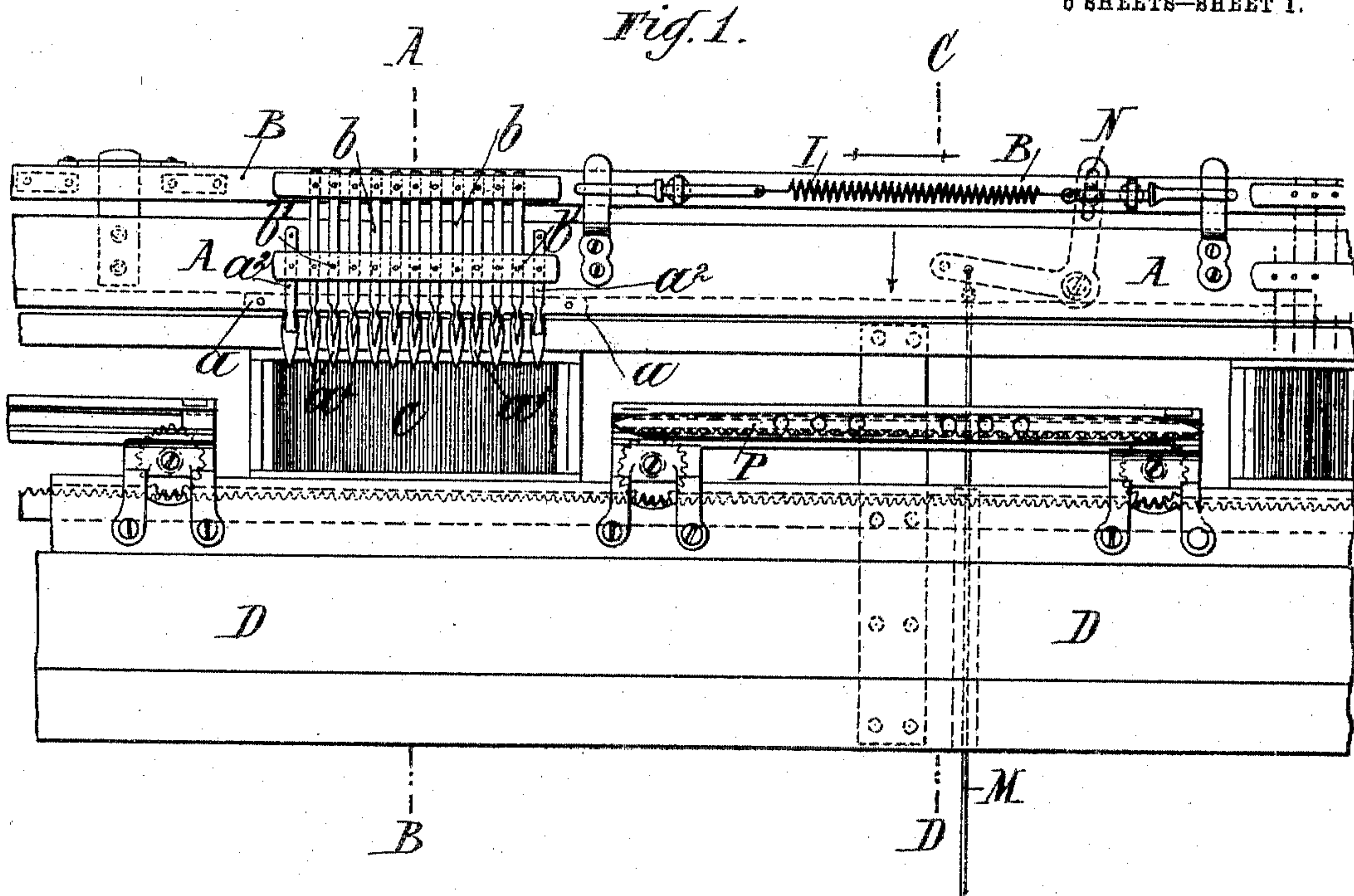
J. P. GELAS.

BROCADING APPARATUS FOR RIBBON WEAVING LOOMS.

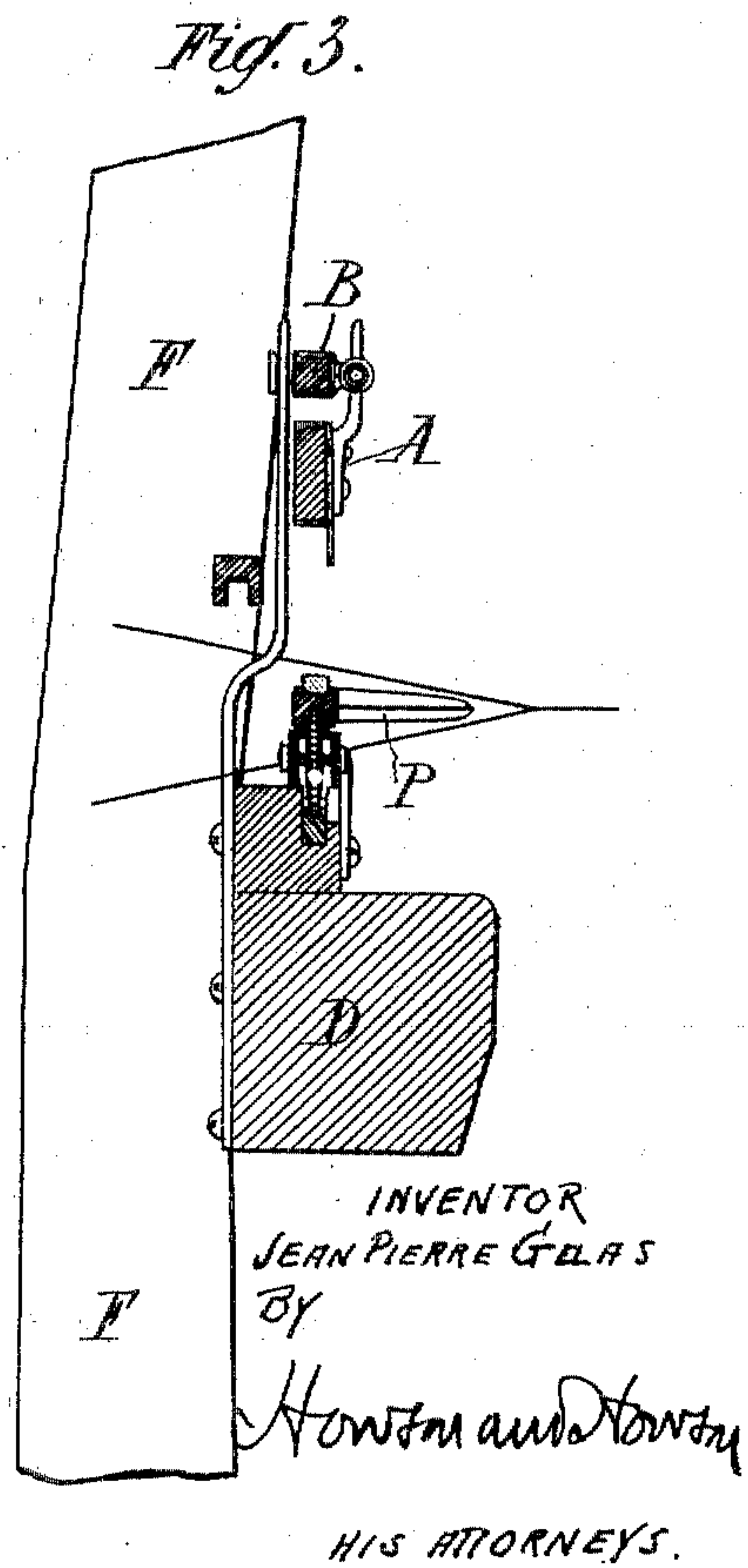
APPLICATION FILED MAR. 31, 1903.

NO MODEL.

6 SHEETS—SHEET 1.



WITNESSES:
F. W. Wright
E. J. Collins



INVENTOR
JEAN PIERRE GELAS
BY

Howden and Howden

HIS ATTORNEYS.

No. 767,141.

PATENTED AUG. 9, 1904.

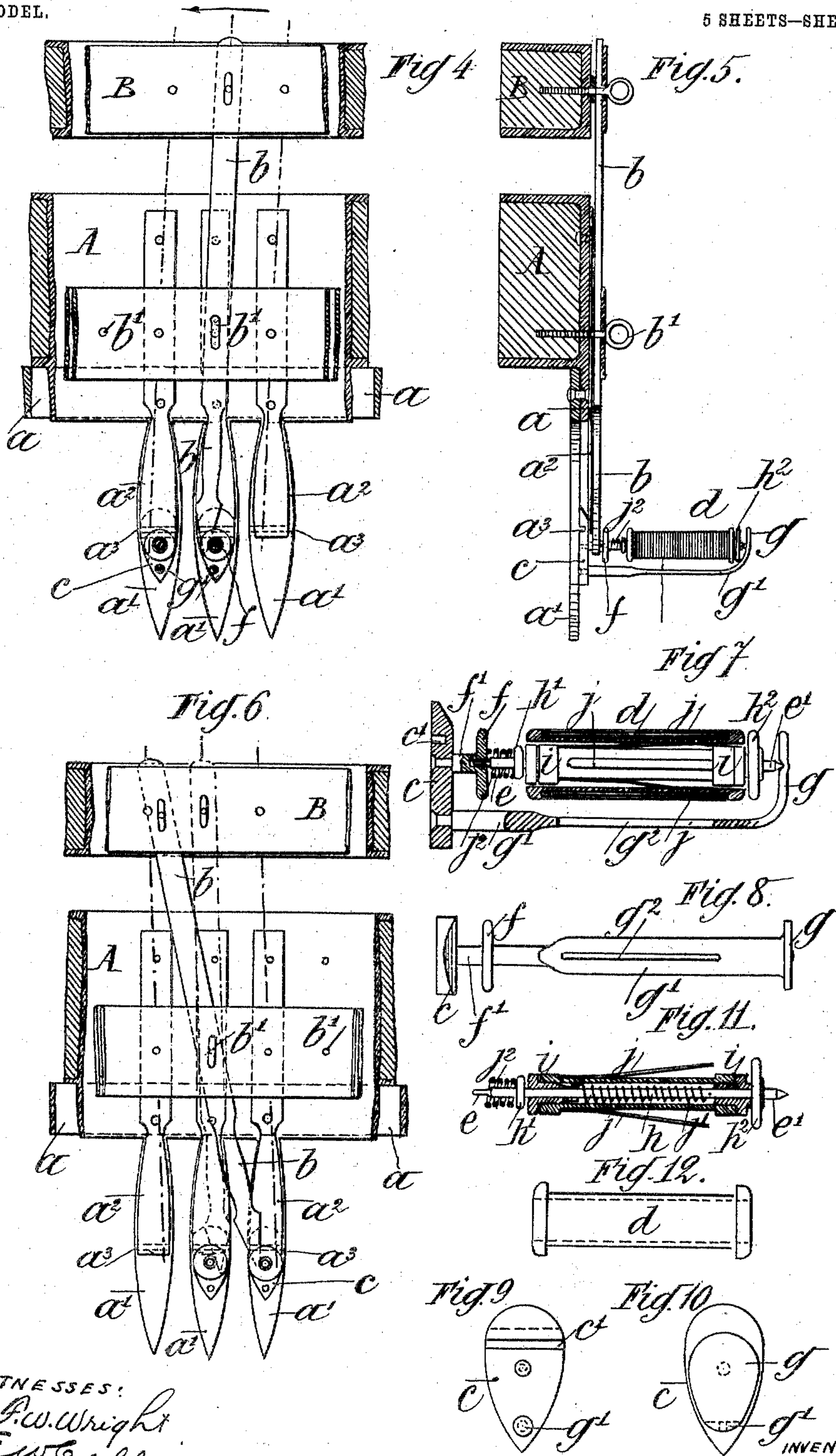
J. P. GELAS.

BROCADING APPARATUS FOR RIBBON WEAVING LOOMS.

APPLICATION FILED MAR. 31, 1903.

NO MODEL.

5 SHEETS—SHEET 2.



WITNESSES:

P. W. Wright
E. W. Collins

INVENTOR
JEAN PIERRE GELAS
BY Howard and Howard
HIS ATTORNEYS

No. 767,141.

PATENTED AUG. 9, 1904.

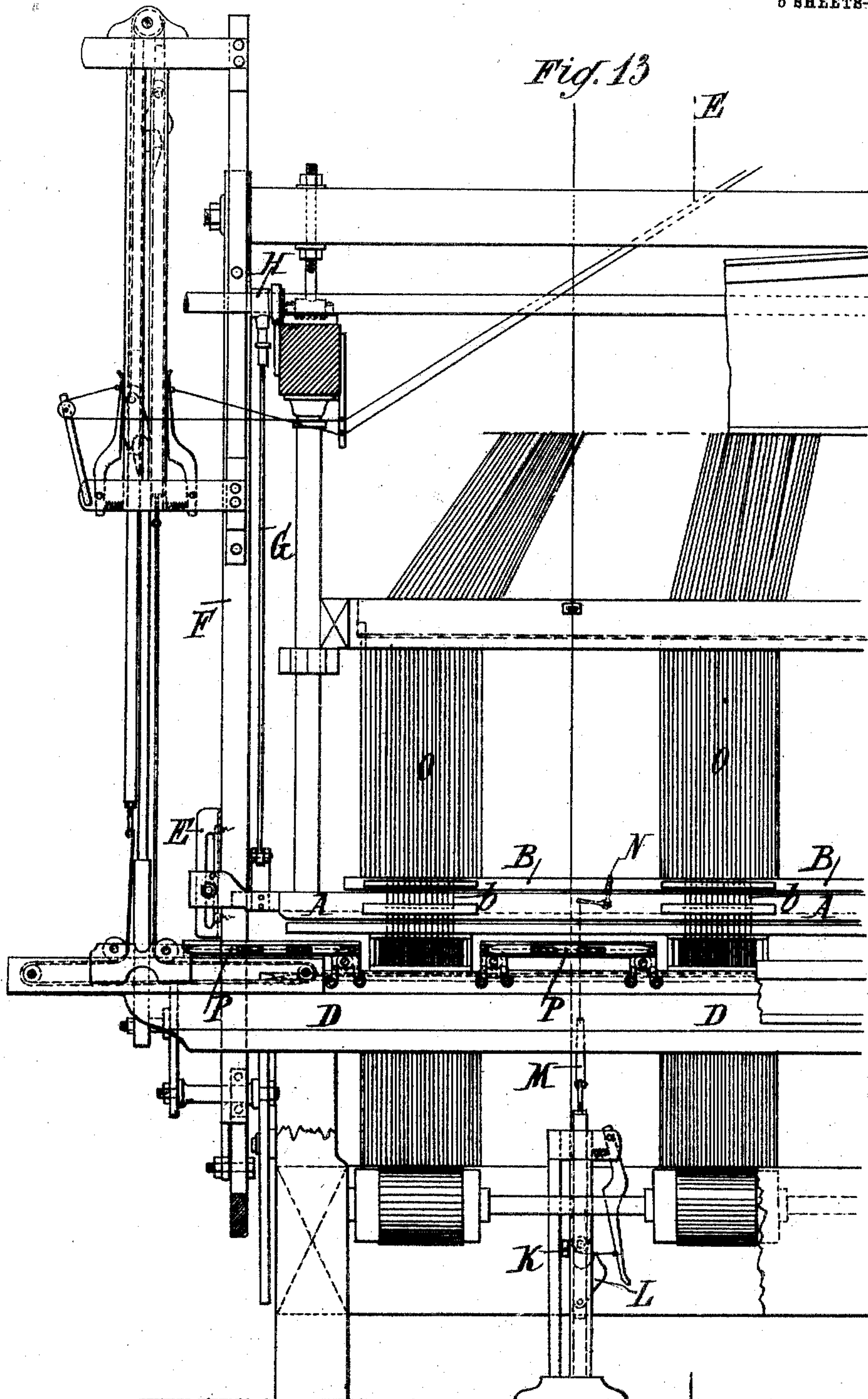
J. P. GELAS.

BROCADING APPARATUS FOR RIBBON WEAVING LOOMS.

APPLICATION FILED MAR. 31, 1903.

NO MODEL.

5 SHEETS—SHEET 3.



WITNESSES:

A. W. Wright.
E. W. Collins

INVENTOR
Jean Pierre Gelas
BY *Howson and Howson*
HIS ATTORNEYS.

No. 767,141.

PATENTED AUG. 9, 1904.

J. P. GELAS.

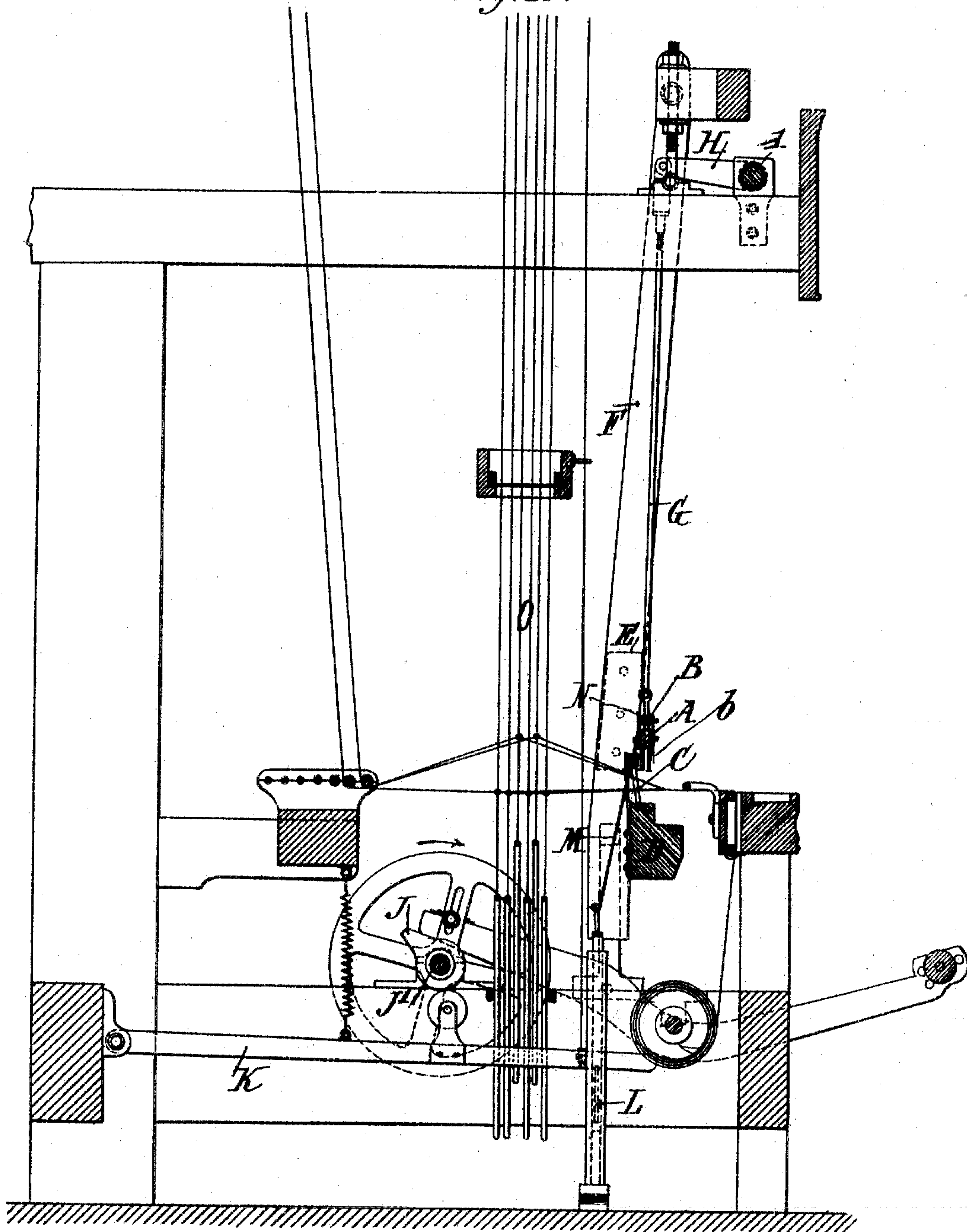
BROCADING APPARATUS FOR RIBBON WEAVING LOOMS.

APPLICATION FILED MAR. 31, 1903.

NO MODEL.

5 SHEETS—SHEET 4

Fig. 14.



WITNESSES:

B. W. Wright
E. W. Collins

INVENTOR

Jean Pierre Gelas
BY
Howson and Howson
HIS ATTORNEYS.

No. 767,141.

PATENTED AUG. 9, 1904.

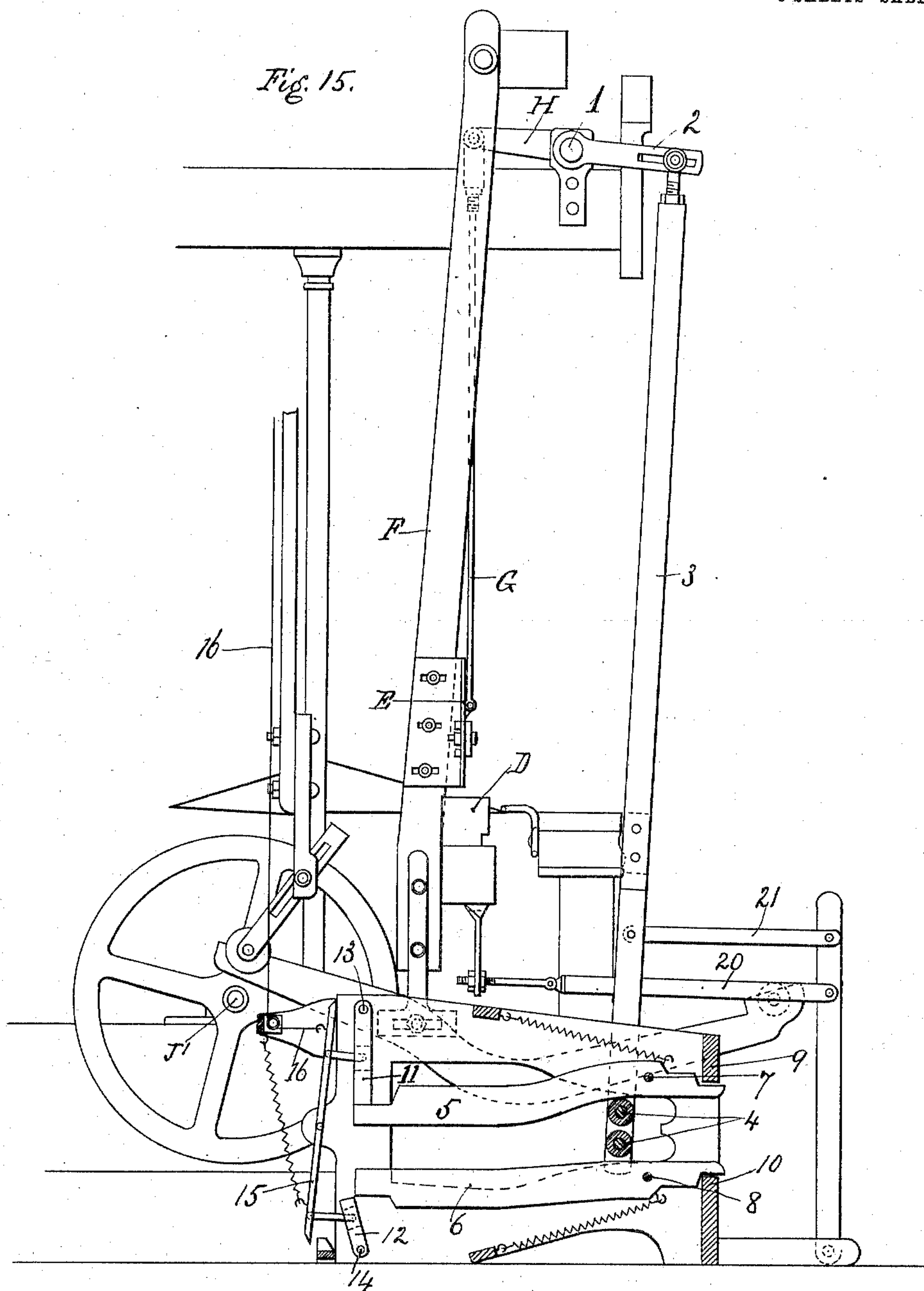
J. P. GELAS.

BROCADING APPARATUS FOR RIBBON WEAVING LOOMS.

APPLICATION FILED MAR. 31, 1903.

NO MODEL.

5 SHEETS—SHEET 5.



WITNESSES

F. W. Wright
Halter abtr

INVENTOR

Jean Pierre Gelas

BY

Howton and Howton

ATTORNEYS

UNITED STATES PATENT OFFICE.

JEAN PIERRE GELAS, OF ST. ETIENNE, FRANCE, ASSIGNOR TO SOCIÉTÉ GELAS ET CO., OF ST. ETIENNE, FRANCE.

BROCADING APPARATUS FOR RIBBON-WEAVING LOOMS.

SPECIFICATION forming part of Letters Patent No. 767,141, dated August 9, 1904.

Application filed March 31, 1903. Serial No. 150,442. (No model.)

To all whom it may concern:

Be it known that I, JEAN PIERRE GELAS, manufacturer, a citizen of the Republic of France, residing in St. Etienne, Loire, France, have invented a Brocading Apparatus for Ribbon-Weaving Looms, of which the following is a specification.

This invention relates to a brocading apparatus specially intended for ribbon-weaving looms and of which the application to these looms permits of producing automatically during the weaving of the ribbon brocade effects over the whole or a portion of the width.

The brocading apparatus in question is applied directly to the batten of ribbon-looms, and like the batten is divided up into independent portions, each corresponding to a ribbon to be woven. This apparatus participates in the angular movement of the batten, but its parts are in addition given movements particular to themselves and which serve to cause pirns or bobbins provided with brocading-threads to enter the warp, to operate there, and finally to return them to their original position. These pirns or bobbins are arranged in such a manner as to permit of suitable tension being constantly given to the brocading-thread.

In order that the invention may be readily and clearly understood, it is represented in the accompanying drawings, in which—

Figure 1 is a front elevation of one of the sections of the brocading appliance mounted upon the batten of a ribbon-loom. Fig. 2 is a cross-section on the lines A B of Fig. 1. Fig. 3 is another cross-section on the line C D of Fig. 1. Fig. 4 shows in detail and upon a larger scale a portion of the section of brocading appliance represented in Fig. 1. Fig. 5 is a corresponding cross-section of the said portion and similar to the cross-section represented in Fig. 2. Fig. 6 is a figure similar to Fig. 4 and serving to show in conjunction with this latter the operation of the essential parts of the brocading appliance. Fig. 7 is a sectional view through a pirn supplied with brocading-thread and mounted on its carriage. Fig. 8 is a plan view of this carriage separate from the pirn. Figs. 9 and 10 are end views

of this carriage. Figs. 11 and 12 show separately the two constituent parts of the pirn. Fig. 13 is a particular front elevation of a ribbon-loom provided with a batten on which the brocading appliance is mounted. Fig. 14 is a cross-section on the line E F of Fig. 13, showing the arrangement of the brocading appliance upon the batten of the ribbon-weaving loom. Fig. 15 is a side elevation of the ribbon-weaving loom, showing the modification introduced into the general operation, owing to the application of the brocading appliance.

The brocading appliance (represented in Figs. 1 to 5) comprises a bar A, provided with a plate a , cut in the form of teeth a' , directed downward, and opposite each of which is situated a flat spring a^2 , fixed above upon the said bar A. Opposite the teeth a' are also situated blades b , mounted upon pivots b' of the bar A and articulated by their upper portion to the bar B, arranged parallel with the bar A and above this latter. The lower portion of the blades b is cut so as to form a point.

Between each of the teeth a' and their respective springs a^2 is situated, Fig. 5, a plate c , constituting the base of one of the carriages carrying the pirn upon which is wound the thread serving to produce the brocade effects upon the ribbons in the course of manufacture. The rear face of these plates c is provided with a groove c' , Figs. 7 and 9, in which is freely engaged a tongue a^3 , formed upon the front face of the teeth a' . The plates c are therefore retained in the vertical direction by the tongue a^3 , owing to the pressure exerted upon them by the springs a^2 .

Each pirn is constituted by a bobbin d , passed freely upon a spindle of special arrangement and to which the terminal points e and e' , Figs. 7 and 11, are journaled, one in a hole formed in a disk f , connected by a rod f' to the plate c , and the other in a cavity formed at the bent extremity g of a rod g' , also fixed to the plate c . This spindle consists of a spindle h , provided with end points e and e' , and upon which are fixed washers h' and h^2 , between which is mounted a sleeve i , passed freely upon the spindle h . Upon the

surface of this sleeve and along generating-lines are inversely fixed flat springs j , serving to produce friction within the bobbin d for the purpose of producing displacement of the
 5 said sleeve during the rotation of the bobbin under the influence of the unwinding of the thread. The inverse arrangement of these springs also serves to insure centering of the bobbins.

10 Within the sleeve i and passed upon the spindle h is mounted a spiral spring j' , one of the extremities of which is fixed to the sleeve itself, while the other is fixed to the spindle h . This spring, serving as a flexible connection
 15 between the sleeve and spindle, becomes wound up in the sense of the unwinding of the thread from the bobbin d and afterward reacts upon this latter by the intermediary of the sleeve i in order to maintain the thread constantly
 20 stretched and to take up any which may have been unwound in excess. Another spiral spring j'' is passed upon the point e of the spindle h . It bears upon the disk f and reacts upon the washer h' for the purpose of
 25 maintaining the spindle h upon its support.

The rod g' , Figs. 7 and 8, is formed with a slot g'' , through which passes the thread coming from the bobbin d and serving, as hereinafter explained, to produce brocade effects.

30 It will be seen that the point of the blades b bears in the condition of repose against the rod f' and the plates c and that this takes place toward the right or the left hand according as the said plates are displaced to the left or
 35 right hand. It will also be noticed that the intermittent angular movement of these blades causes the carriage of the pirn to pass from one tooth a' to the adjacent tooth and this alternately toward the right or left hand.

40 The teeth a' , referred to above, form groups intended to correspond with the combs C of the batten D of ribbon-looms, and each group comprises a number of teeth a' , varying according to the greater or less extent of these
 45 combs.

The bar A , with its groups of teeth a' , is mounted upon a batten D in such a manner as to participate in the displacement of this latter, while at the same time being free to effect a relative movement of descent and ascent. To this end its extremities are in engagement with slideways E , Figs. 13 and 15, fixed to the uprights F of the batten D . They are suspended from rods G , carried by arms
 50 H , to which an angular displacement is imparted at the desired moment by means of a mechanism known as "ascension" mechanism and which may be placed in the ordinary manner under the control of a jacquard mechanism. It follows from this that the teeth a' of the bar A are caused to descend at the proper moment into the warp-threads raised by the heddles O in the ordinary manner, so as to form the shed in which the shuttles P , serv-

ing to deposit there the weft-thread for the
 65 formation of the ribbon, travel.

The ascension mechanism referred to in the foregoing paragraph may be such as represented in Fig. 15, but I do not claim its specific construction as my invention.

70 As shown in Figs. 13 and 15, the two bars A and B are mounted on the batten D and are vertically supported by rods G , suspended from arms H on a rock-shaft 1, mounted in the frame. To another arm, 2, of the rock-shaft is hung a rod 3, carrying two rollers 4.
 75 Suitable links 20 21 connect this rod to the batten, so that the rod will partake of the oscillating motion of the batten. Two curved cam-levers 5 6, pivoted at 7 8 and provided
 80 with stops 9 10 and springs to normally hold them against said stops, serve to control the rocking motion of the rock-shaft H through the medium of two dogs 11 12, pivoted at 13 and 14, each dog being connected to one end
 85 of a spring-controlled lever 15, operatively connected by the cord 16 to the jacquard mechanism.

The operation is as follows: Suppose it is desired to lower the brocading-bars A and B
 90 into the shed. Traction is then exerted on the cord 16, dog 12 inserted under cam-lever 6, and dog 11 freed. As the batten D moves to the left, Fig. 15, the lower roller 4 bears upon it, the rod 3 is raised, the rock-shaft 1
 95 and arm H oscillated, the rods G depressed, and the brocading apparatus plunged through the lifted warp-threads into the shed. It is after this has been accomplished that the automatic mechanism L of Fig. 13 is operated
 100 to move the crank N , rod B , and the pirns to cause them to be transferred within the shed. If upon the next throw to the left of the batten it is not desired to have the brocading-thread in the design, then lever 6 is allowed
 105 to occupy the position shown in Fig. 15, in which case the upper roller 4 travels under cam-lever 5, pulls the rod 3 down, and through the rock-shaft 1 and arm H lifts the pirns and their carrier-bars out of the shed by means of
 110 the rods G . For its part the bar B , upon which are articulated the blades b , travels like the bar A with the batten D , but it is also capable of intermittent reciprocating longitudinal movement alternately to the right and
 115 to the left hand in such a manner as to cause the blades b to rotate upon their pivots b' , so that they will displace the corresponding pirn-carriages, as above stated. Thus if Fig. 4 be inspected it will be seen that the blade b bears
 120 upon the left-hand of a pirn intended to be conveyed in the right-hand direction. The intermittent longitudinal movement of the bar B toward the left hand will therefore serve to convey this portion toward the right hand,
 125 Fig. 6; but it will be noticed that the plate b does not remain in the position indicated in continuous lines in Fig. 6, but that it resumes

immediately after having produced its effect the position shown in dotted lines in such a manner as to be in readiness for subsequent action in the opposite direction. Each sudden intermittent movement of the bar B serving to produce this effect is obtained in any convenient and automatic mechanism constituted by a cam J, keyed upon the main shaft J' of a lever K of a detent system L, arranged in the ordinary manner under the control of a jacquard mechanism, of a link M, and of a lever or angle-piece N, connecting with the bar B, as represented in Figs. 13 and 14. The intermittent conveyance of the pirns *d* from one tooth *a'* to the adjacent tooth, either to the right or left hand, will only take place after the said teeth have been immersed in the warp, and this conveyance is immediately followed by the lifting of the teeth *a'*. It will be noticed that the teeth *a'* by reason of their olive shape separate the raised warp-threads sufficiently to permit of the introduction of the pirns into the shed. The plates *c* are also cut olive-shaped for the same reason. In this manner any catching of the warp is obviated. The immersion, the lateral conveyance, and the lifting of the pirns *d* cause the threads of these pirns to surround the lifted warp-threads situated between the extreme points of the lateral travel. The arrangement of the spindle of these pirns also serves to leave the maximum of liberty to the bobbins, while at the same time permitting them to place the spring *j'* in tension, this spring being intended when once the pirns are raised to cause them to take up thread which may have been unwound in excess, and consequently to uniformly tighten the brocade-threads.

It is obvious that owing to the operation of the heddles O, arranged in the ordinary manner under the control of a jacquard mechanism, the threads lifted are not always the same and do not always occupy the same position, so that, in short, the brocade-threads are able to produce brocade effects of any desired design. It will also be noticed that the shuttles P of the ribbon-loom provided with the brocading appliance described above are constituted and continue to operate in the same

manner as heretofore and that they are still utilized for the formation of the ground fabric, while at the same time the brocading-pirns *d* produce their brocade effect in the manner above stated.

A stroke of the batten is given each time a weft-thread or brocading-thread has been deposited.

I claim as my invention—

1. A brocading apparatus for looms, comprising pirns, and pirn-carriages mounted on a bar A, operating-blades, a bar B adapted to operate said blades, a batten on which both bars are mounted, both bars together being adapted to be vertically moved on said batten, and said bar B being adapted to be horizontally moved on said batten and means for automatically controlling said vertical and horizontal motions from jacquard cords, substantially as described.

2. A brocading apparatus for looms, comprising a bar A, depending-teeth secured thereto, a rib on each tooth and a flat spring of less length than the tooth in front of each tooth, slotted carriers for the pirns, adapted to be held between the springs and the teeth with their slots engaging the ribs, substantially as described.

3. A pirn-carrier for brocading apparatus, comprising a plate C, a rod *f'* terminating in a disk *f* and a bent rod *g'* secured to said plate, said pirn being adapted to be held between said bent rod and disk, substantially as described.

4. In combination with the batten, a plurality of shuttles mounted thereon, combs, and the automatic shuttle-operating apparatus of a ribbon-loom, two bars carrying pirn-carriages mounted on said batten and automatic means for inserting and transversely operating said pirns within the shed, substantially as described.

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

JEAN PIERRE GELAS.

Witnesses:

LÉON CRANEKENT,

AUGUSTUS E. INGRAM.