

No. 640,706.

G. SCHAEFER & F. HINKEL.
LOOM.

Patented Jan. 2, 1900.

(Application filed Feb. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

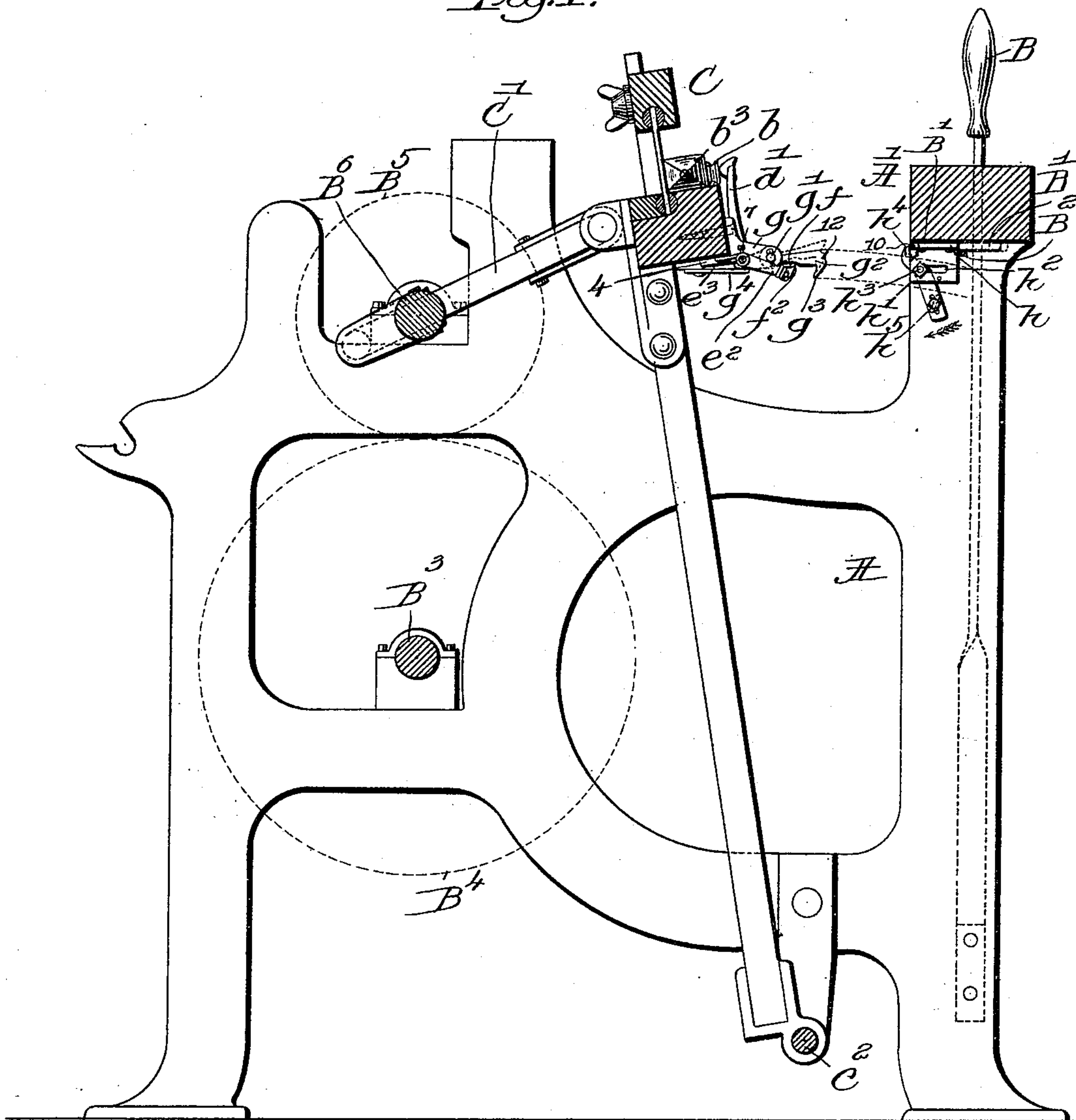
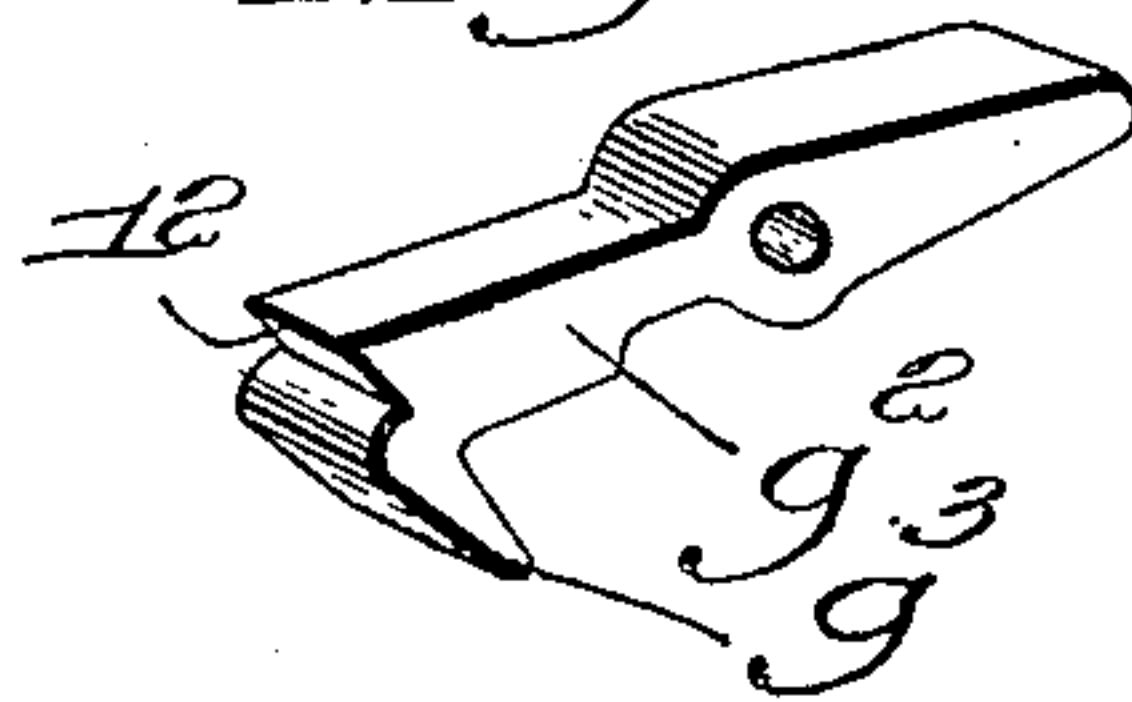


Fig. 2a



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Fig. 3.

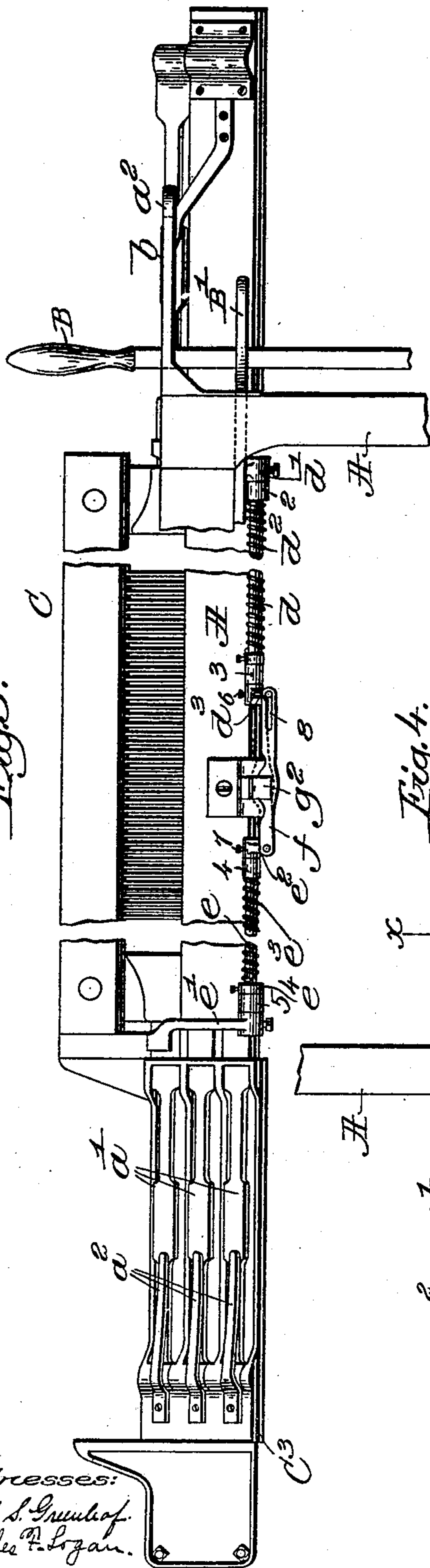
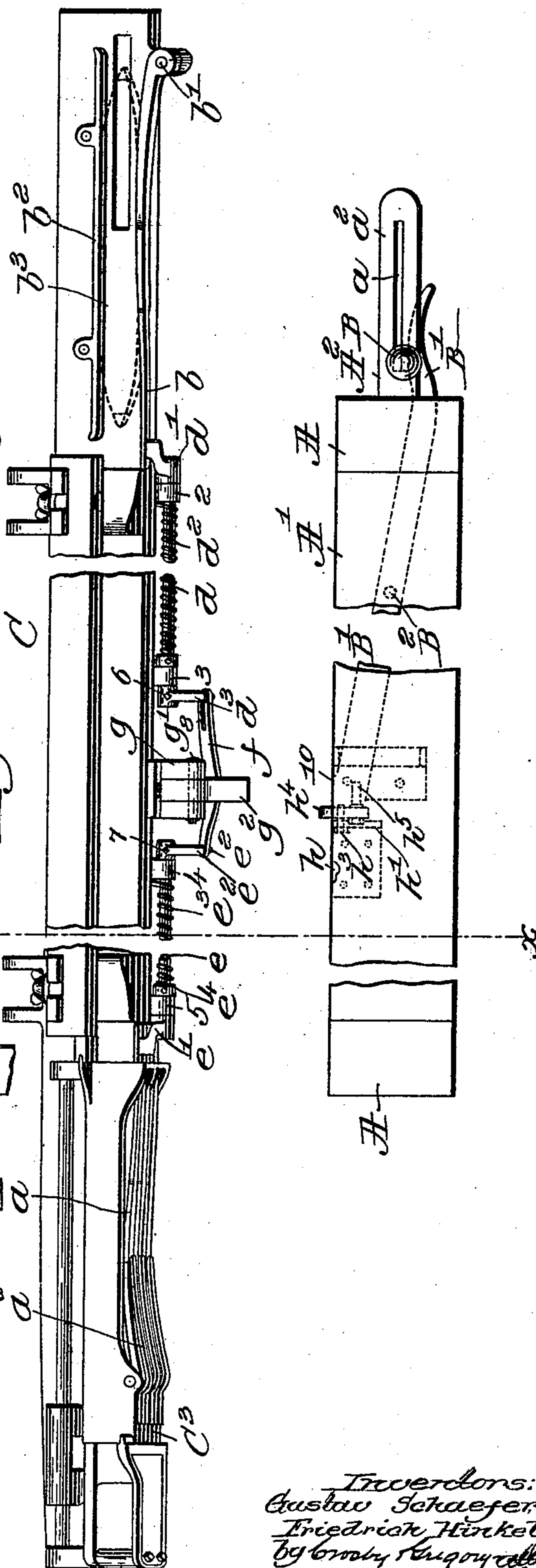


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

GUSTAV SCHAEFER AND FRIEDRICH HINKEL, OF CLINTON, MASSACHUSETTS.

LOOM.

SPECIFICATION forming part of Letters Patent No. 640,706, dated January 2, 1900.

Application filed February 27, 1899. Serial No. 706,956. (No model.)

To all whom it may concern:

Be it known that we, GUSTAV SCHAEFER and FRIEDRICH HINKEL, of Clinton, county of Worcester, State of Massachusetts, have
5 invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 In looms as now commonly constructed it is customary to stop the loom automatically whenever the shuttle is not present, as it should be, in the shuttle-box.

Herein we have provided a loom with means
15 whereby whenever the shuttle is absent from the box in which it should be at either end of the lay the loom will be stopped, and so, also, should two boxes occupying a position at the level of the race of the opposite ends
20 of the lay each have a shuttle then the loom will be automatically stopped.

In accordance with our invention we combine with the lay having shuttle-boxes at its
25 opposite ends and carrying a bunter having two acting portions two binder-shafts, each having at one end a binder-finger to act on a binder of a shuttle-box and at its other end a projection, the projection of one shaft entering a hole at one end of the bunter-rest, while
30 the projection of the other binder-shaft enters a slot in the said bunter-rest, the bunter-rest being shown as convexed at its top. With the use of these devices the loom may be stopped whenever a shuttle is absent from
35 the box in which it should lie at either end of the lay, and so, also, should two boxes occupying a position at the level of the race of the lay at opposite ends thereof have a shuttle.

Figure 1, in partial section, shows a sufficient
40 part of a loom with our improvements added to enable our invention to be understood. Fig. 2 shows the dagger-rest detached. Fig. 2^a shows the double-acting bunter detached and enlarged. Fig. 3 is a partial front
45 elevation of a loom with our improvements added, the drawing showing chiefly parts of the lay, usual shuttle-boxes, and parts carried by the lay, together with one corner of the loom-frame and part of the breast-beam, the breast-beam and lay being broken out to
50 save space on the drawings; and Fig. 4 is a

top or plan view of the parts shown in Fig. 3, it representing, however, more of the breast-beam.

The loom-frame A, its breast-beam A', the
55 shipper-holding plate A², extended from the loom side and having a slot *a* provided with a side notch in which may be held the shipper-handle B, the knock-off lever B', pivoted at B² at the under side of the breast-beam, the
60 cam-shaft B³, having an attached toothed gear B⁴, which meshes with a smaller gear B⁵, fast on the crank or lay shaft B⁶, united with the lay C by connecting-rods C', the lay-shaft C², the shifting shuttle-boxes C³ at one side
65 of the loom, each shuttle-box having a suitable binder *a'*, acted upon by a spring *a*² to normally press the binder toward the shuttle in a cell of the shuttle-box, and the binder *b* at the opposite end of the lay, pivoted at *b'*,
70 the guide-plate *b*², forming part of the shuttle-box, at the right-hand end of the lay, and the shuttle *b*³ are and may be all as common in usual looms.

We have provided the lay at its under side
75 with suitable ears or boxes 2 3 4 5. The boxes 2 3 contain a binder-shaft *d*, having at one end a binder-finger *d'*, which is normally kept pressed against the free end of the binder *b* by a suitable spring *d*², surrounding said
80 shaft and connected at one end to a collar thereon, the opposite end of the spring contacting with the ear 2 or other part of the lay. The opposite end of the shaft *d* has a projection *d*³, the hook of which is fixed to said
85 shaft by a suitable set-screw 6. At the opposite or left-hand end of the lay the ears 4 5 receive a second shaft *e*, having attached to one end of it a binder-finger *e'*, and at its opposite end by a set-screw 7 a projection *e*²,
90 said binder-finger being normally held pressed against whatever binder *a'* is opposite it by or through a suitable spring *e*³, surrounding said shaft *e*, one end of said spring being fixed to a collar *e*⁴, fast on said shaft, while the other
95 end contacts with some fixed part of the lay. These two shafts are connected by a dagger-rest *f*, the shape of which is best shown in Fig. 2. This link is pivotally mounted at one end upon the projection *e*², while at its other
100 end it has a slot 8, which is entered by the projection *d*³, a suitable cotter-pin being passed

through a hole in said projection to retain the link upon said projection.

The lay has attached to it a casting or block g , having a pivot or stud g' , upon which is mounted a double-acting bunter composed of an arm g^2 , having projecting, as herein shown, from its under side a hook g^3 , said arm and hook being best shown in Fig. 2^a. The bunter is acted upon near its pivot by a spring g^4 , which normally serves to depress the acting front end of the bunter.

To the under side of the breast-beam we have attached a stand h , having a depending apron h' , slotted at h^2 , said slot receiving in it an adjustable stud h^3 , upon which is mounted a lever h^4 , having adjustably connected at its lower end and extended therefrom a stud h^5 . The upper end of this lever h^4 stands normally close to and bears against the end 10 of the knock-off lever b' , and the head 10 of the said knock-off lever is notched, as best shown in Fig. 1, where the same is shown by looking at the loom from the left of the dotted line x , Figs. 2 and 3. Viewing Fig. 1, it will be seen that there is a space between the grooved edge of the knock-off lever and the projecting stud h^5 .

When the shuttle is in its proper position in one of the shuttle-boxes opposite the level of the race of the lay, whichever box the shuttle is in will cause the binder of the box having the shuttle to turn the rock-shaft d or e and depress the projection d^3 or e^2 , such depression of either one of said projections singly lowering the dagger-rest f , so that the double-acting binder moves backward and forward in the space between the end 10 of the knock-off lever and the projection h^5 , and consequently the knock-off lever is not moved. Should, however, the shuttle be absent from either box, then the spring d^2 or e^3 , acting upon the shafts d or e , will turn the binder-finger d' or e' inwardly, moving the binder b or a into the shuttle-box, such movement causing whichever projection d^3 or e^2 is moved to lift the dagger-rest f , so that it, acting by its projection f^2 against the under side of the bunter, will lift the same, so that in case a shuttle be absent from both boxes the end 12 of the upper part of the bunter will meet the end 10 of the knock-off lever and turn it to release the shipper-handle from its usual notch in the holding-plate a^2 .

Should the shuttle-boxes opposite the level of the race of the lay at each end of the reed have a shuttle in them, then in such case there is a fault and the binders of both of said boxes, held out by the shuttles in them, will act to turn the binder-fingers outwardly, lowering both the projections d^3 and e^2 , which move downwardly the rest f , permitting the spring g^4 , acting with the gravity of the bunter, to lower the bunter so that its hooked part g^3 in the back stroke of the lay will catch the projection h^5 , turn the lever h^4 in the direction of the arrow just below it, Fig. 1, causing the upper end of said lever to meet

the end 10 of the knock-off lever, and release the shipper-handle from the loom. In this way it will be understood that the lay will be stopped automatically whenever a shuttle is absent from the box in which it should appear, and also whenever two shuttles are presented in opposite boxes where under ordinary circumstances there should be but one shuttle, and it is especially this last action of stopping the loom when there is a shuttle in opposite boxes at the end of the lay that we believe our invention to be essentially new and novel and never before known.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A lay having shuttle-boxes at opposite ends thereof and provided with a bunter, two binder-shafts carried by the lay, each having at its outer end a binder-finger to act on a binder of a shuttle-box, and at its inner end a projection, and a bunter-rest having one end pivoted to one of said projections and the other end joined to the other projection by a pin-and-slot connection, combined with a shipper-handle and means adapted to be acted upon by said bunter in either of its extreme positions to dislodge the shipper-handle and stop the loom whenever a shuttle is absent from either box in which it should be present, and whenever two boxes at the level of the race each have a shuttle, said bunter occupying a third position intermediate its extreme positions whenever the shuttles are in their correct boxes.

2. A lay having a shuttle-box at opposite ends thereof and provided with a bunter having two acting positions; two binder-shafts carried by the lay, each having at its outer end a binder-finger to act on a binder of a shuttle-box, and at its inner end a projection, and a bunter-rest having at one end a hole and at its opposite end a slot, and provided centrally with a rest on which the bunter is supported, one of said projections entering the hole and the other the slot in the ends of the bunter-rest; combined with a shipper-handle and means adapted to be acted upon by said bunter in either of its extreme positions to dislodge the shipper-handle and stop the loom whenever a shuttle is absent from both boxes at opposite sides of the lay, and whenever both boxes at opposite sides of the lay on a level with the race each contain a shuttle, said bunter occupying a third position intermediate its extreme positions whenever a shuttle is in one of the boxes at the level of the race, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GUSTAV SCHAEFER.
FRIEDRICH HINKEL.

Witnesses:

WILLIAM JENDRICK,
JOHN J. GUTMAN.