(No Model.) 4 Sheets—Sheet 1.

J. F. HAGGENMACHER.

LOOM.

No. 413,299. Patented Oct. 22, 1889.

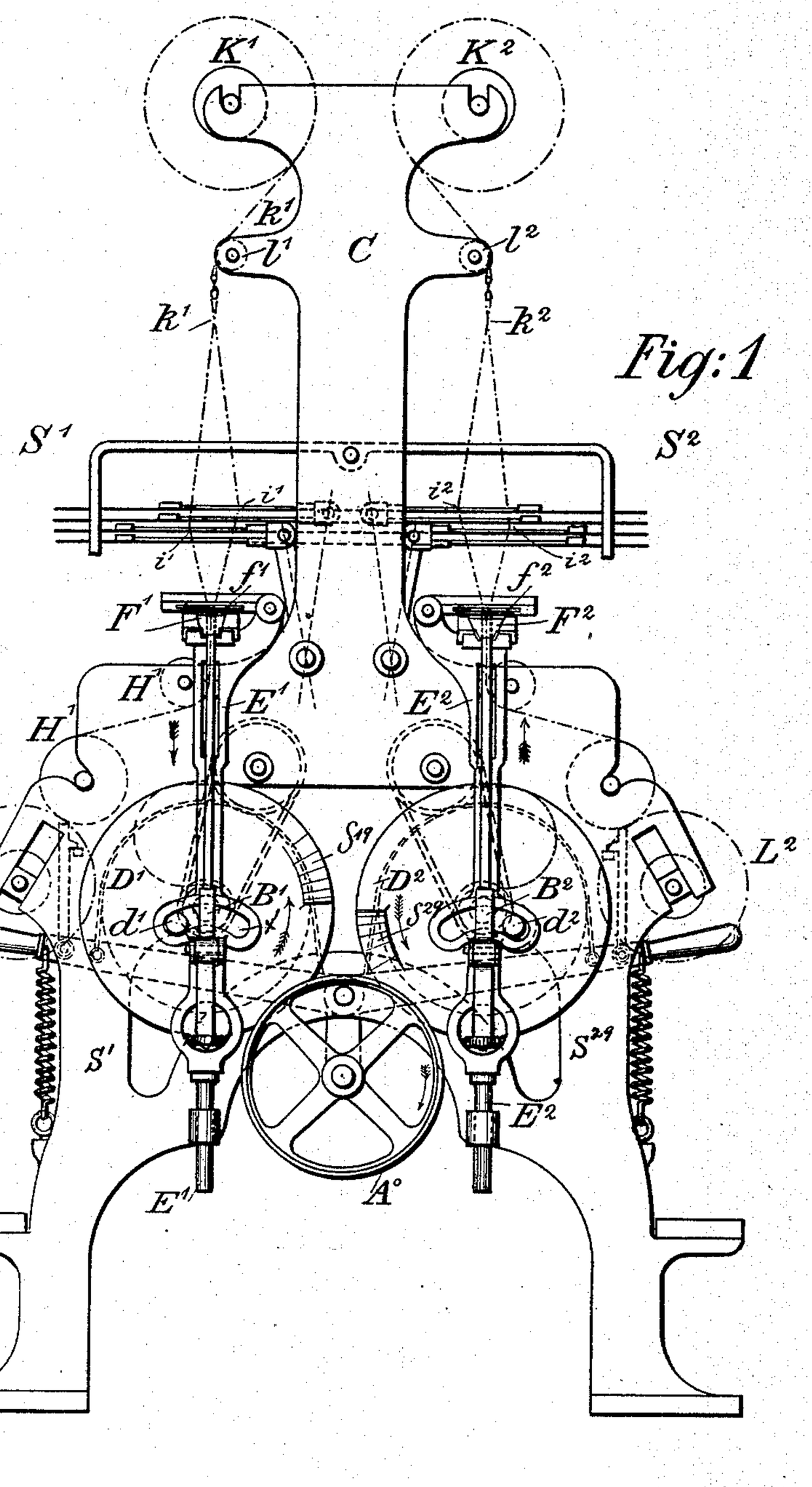

Fig: 1

Witnesses:
Oscar Haase.
M. Malzdorf.

Inventor:
Jakob Friedrich Haggenmacher
by R. Burwell Ashby

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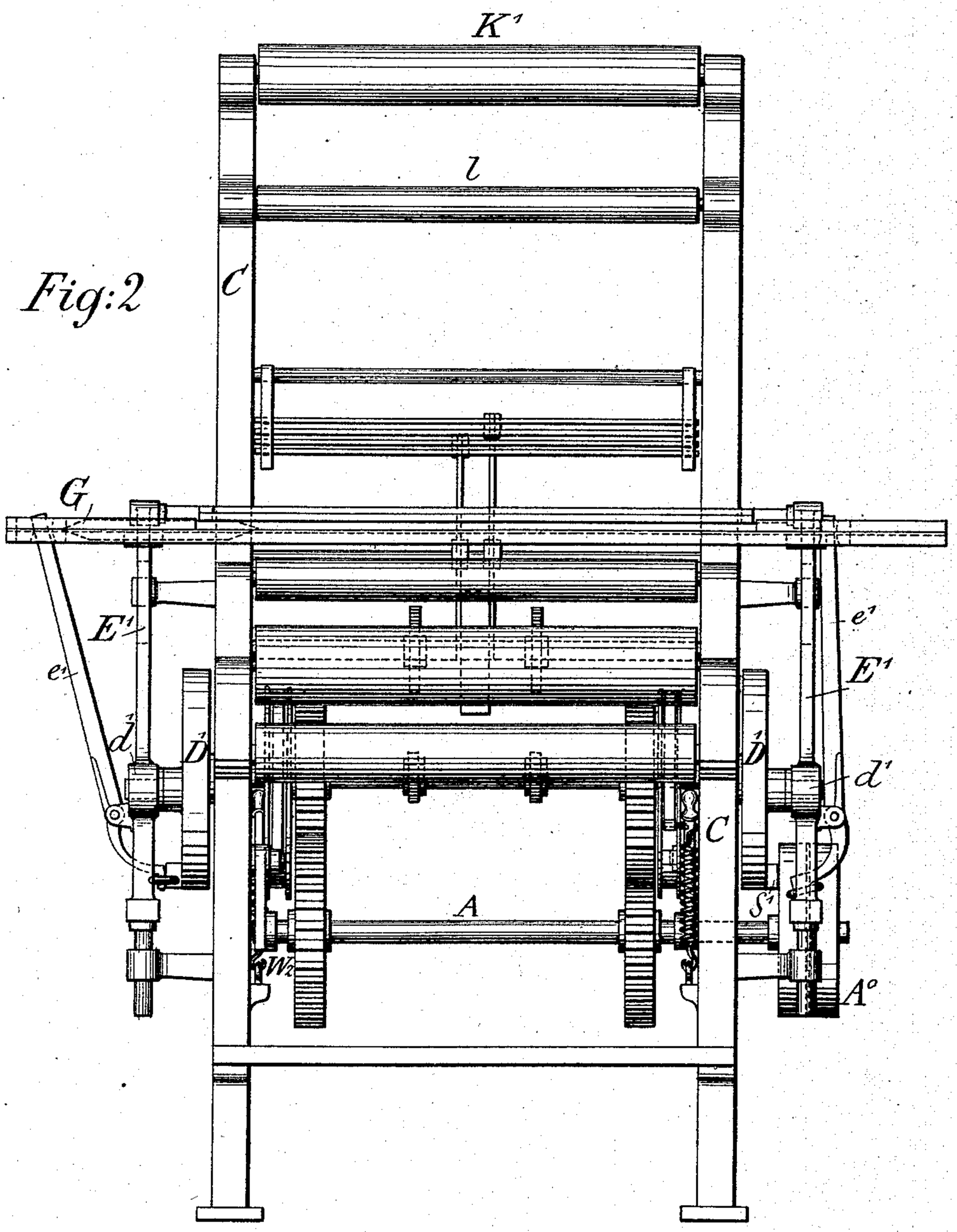
J. F. HAGGENMACHER.

LOOM.

No. 413,299. Patented Oct. 22, 1889.

Fig:2



Witnesses:
Oscar Hause,
M. Holzdorf.

Inventor:
Jakob Friedrich Haggenmacher
by R. Burwell

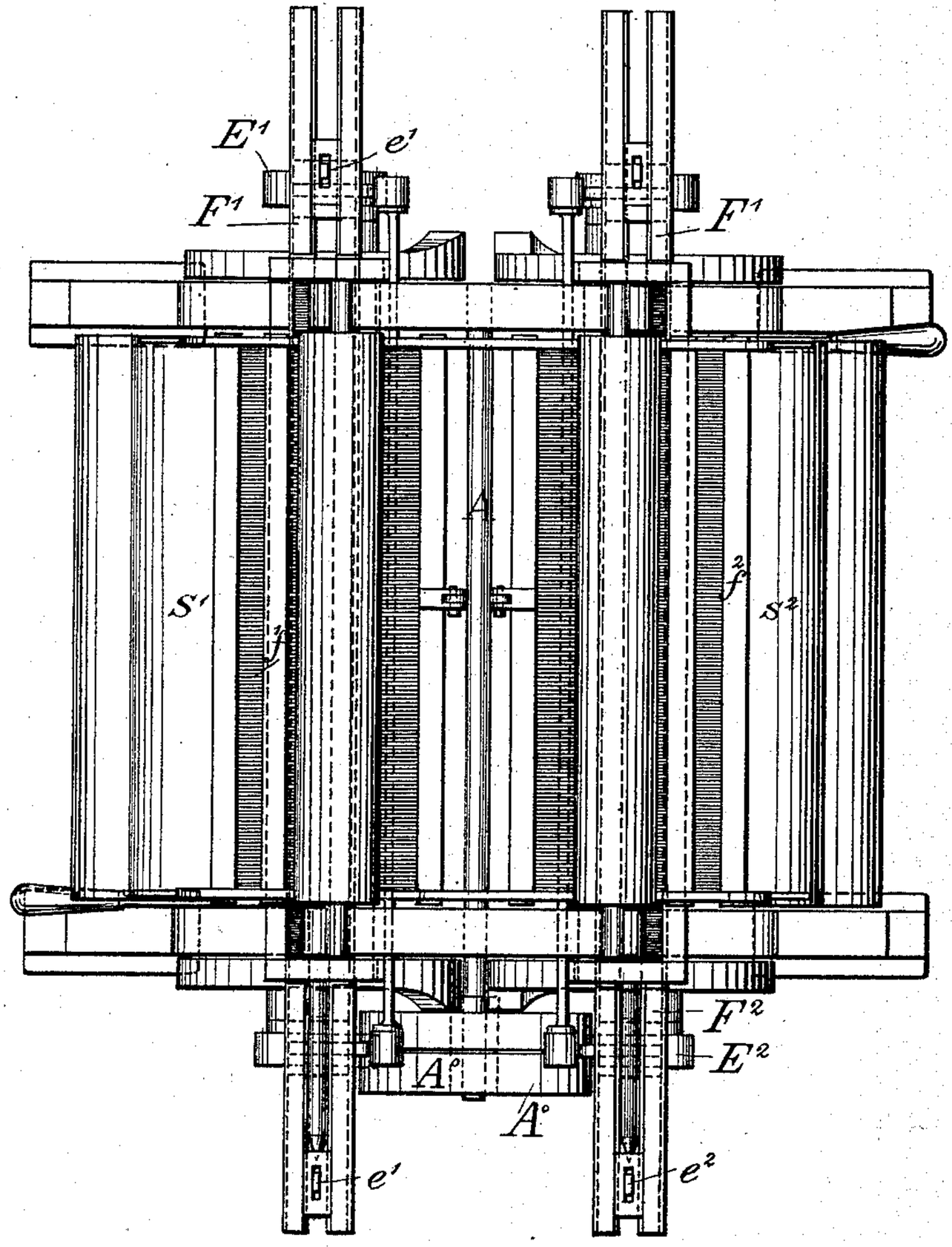
(No Model.) 4 Sheets—Sheet 3.

J. F. HAGGENMACHER.

LOOM.

No. 413,299. Patented Oct. 22, 1889.

Fig: 3



Witnesses:
Oscar Haase.
M. Matzdorf

Inventor:
Jakob Friedrich Haggenmacher
by A. Bonnally

(No Model.) 4 Sheets—Sheet 4.

J. F. HAGGENMACHER.

LOOM.

No. 413,299. Patented Oct. 22, 1889.

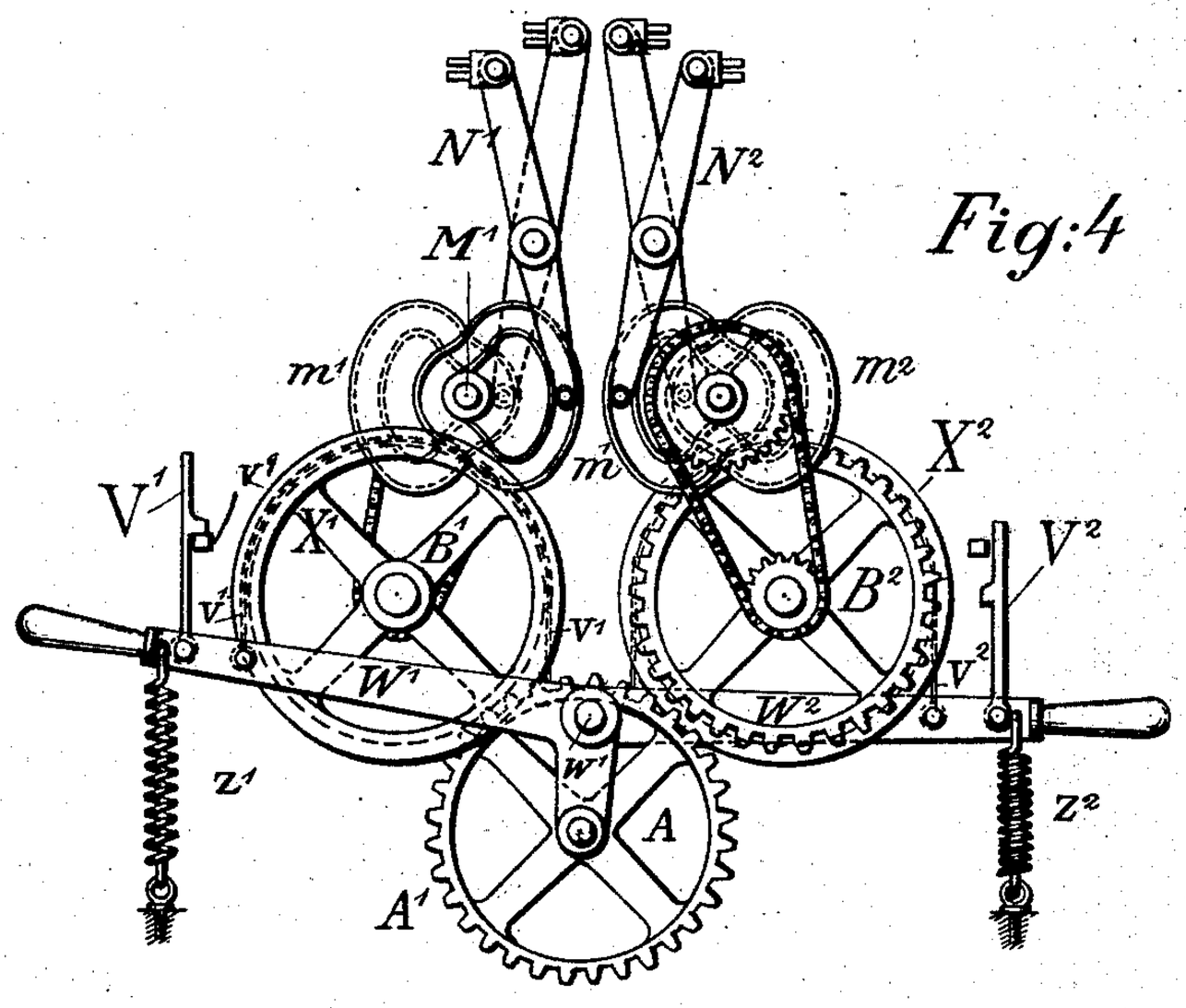


Fig: 4

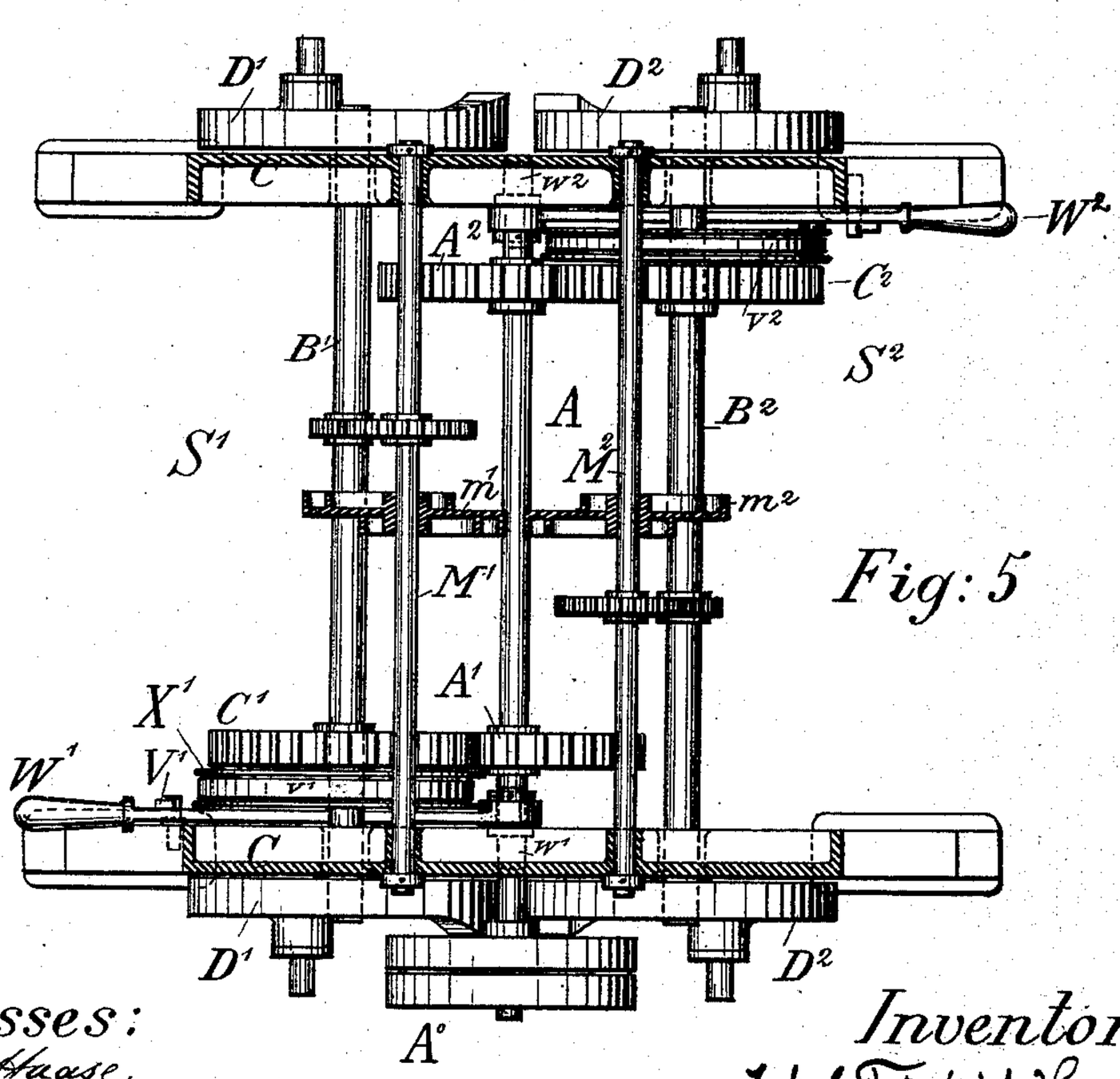


Fig: 5

Witnesses:
Oscar Haase.
M. Malzdorf.

Inventor:
Jakob Friedrich Haggenmacher.
by R. Burnett

UNITED STATES PATENT OFFICE.

JAKOB FRIEDRICH HAGGENMACHER, OF ZURICH, SWITZERLAND.

LOOM.

SPECIFICATION forming part of Letters Patent No. 413,299, dated October 22, 1889.

Application filed October 3, 1888. Serial No. 287,103. (No model.) Patented in England August 3, 1888, No. 11,246; in Belgium October 15, 1888, No. 83,360, and in Switzerland February 8, 1889, No. 454.

To all whom it may concern:

Be it known that I, JAKOB FRIEDRICH HAGGENMACHER, a citizen of the Republic of Switzerland, residing at Zurich, Switzerland, have invented certain new and useful Improvements in Looms, (for which I have received Letters Patent in Great Britain, No. 11,246, dated August 3, 1888; in Belgium, No. 83,360, dated October 15, 1888, and in Switzerland, No. 454, dated February 8, 1889,) of which the following is a specification.

This invention consists of a vertical double loom, the novel features whereof will be fully described hereinafter.

In the annexed sheets of illustrative drawings, Figure 1 is a side elevation of a double loom, illustrating my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view. Fig. 4 is a side elevation of the driving-gear and of the changing mechanism detached. Fig. 5 is a plan of the same.

The loom is arranged as a perfectly symmetrical double loom with a common central driving-shaft A, that carries on one side a driving-pulley A^0. Each side of the double loom—that is to say, each single loom S′ and S^2—has its movement independent of the other—that is to say, each side of the double loom is capable of being placed in or out of operation independently of the other side.

B′ and B^2 are the driving-shafts of the vertical looms with their bearings in the frame C.

For the sake of clearness, I will describe the general features of each separate vertical loom, which, however, do not separately form the subject of the present application. It will only be necessary to describe one loom or one-half of the double loom—viz., that half marked with reference-letters having the index 1. The arrangement of the other loom, which has reference-letters with the index 2, is of exactly similar construction to the one I will describe.

Upon the shaft B′ of the loom are mounted two crank-pin disks D′, the crank-pins *d′* of which cause the lifting-rods E′ of the lathe F′ to move up and down in straight guides. The side slot X′ in the lifting-rod serves to permit the lateral movement of the crank-pin *d′*. The said slot is moved upward to allow for the travel of the shuttle. In the lifting-rods E are pivoted the picking-arms *e′*, which are capable of movement within certain limits. The upper or picking end of each is arranged in the lathe in the path of the shuttle, so that when the shuttle is moved it will be stopped by the arm at the end of the lathe opposite to that from which it started. The lower end is so situated that at certain times—that is to say, when the shuttle is to be picked or beaten—the said lower end will lie in the path of the picking-cam S^{19}, one of which is situated on each disk D′. The picking-arms and picking-cams are arranged exactly symmetrically on both sides. The picking-arm *e′* on the right hand, Fig. 2, has just been tapped by and is out of engagement with its picking-cam, and therefore is not subject to the action thereof until its position is changed by the return movement of the shuttle. On the other or left-hand side the portion of the picking-arm which receives the blow lies in the path of the picking-cam in consequence of the blow received before by the shuttle G, which travels in a guideway in the lathe beneath the reed to guide its movement when moved to and fro by the picking-arms. The picking-arms *e′* move with the lifting-rods E′, (which lift or raise the lathe F′,) and receive on the right and left the blows of the picking-cams S′, which are mounted on the similar crank-disks D′, that lift or raise the lathe. From the warp-beam K′ the warp *k′* passes over the roll *l′*, supporting the warp through the eyelets or rings *i* and *i*, and then through the reed around the rollers H′ to the beam L′. These arrangements, together with the shuttle and the path of the shuttle, are only shown diagrammatically, since they do not form the subject of the present application and only serve to render the explanation of the invention more clear. The movement of the treadle-cams and shafts or leaves may be effected in any suitable way.

In Figs. 4 and 5 an arrangement is shown by way of example in which the shaft M′, driven from the shaft B′, forms the shed with the aid of cams *m′* and levers N′. These figures show separately the driving-gear of the two looms S′ and S^2, which are situated in the common frame C. The bent lever W′ serves to throw the left-hand loom S′ in and out of gear. This lever is capable of movement

about a pin w', which is fixed in the frame C, and the shorter arm of the lever carries one bearing of the driving-shaft A. To the longer arm of the lever is attached a brake-band v', which passes over the brake-pulley X', mounted on the shaft B', and is attached at the other end to a fixed point on the frame C at c'. Mounted upon the brake-pulley X', or keyed at one side of the same on the shaft B', is the toothed wheel C', which engages with the toothed wheel A', mounted on the shaft A as soon as the lever W' is raised. This lever is maintained in a raised position by hanging or fixing the catch V' upon its corresponding catch, as shown in the drawings. When the catch V' is shifted, the lever W' will by its own weight fall so as to tighten the brake-band X', which action is accelerated by the downward pull of the spring, Z'. In place of the toothed wheels A' C', friction-disks or the like may be employed. Exactly the same device for throwing the loom S^2 in and out of gear is provided on the other frame C of the double loom. The toothed wheel A^2, mounted on the opposite end of shaft A, can be thrown into or out of gear with the toothed wheel C^2 by the raising or depression of the bent lever W^2. The same is shown thrown out of gear in Fig. 4.

As shown in Fig. 4, the vertical loom S' would be thrown into gear while the loom S^2 would be thrown out of gear. The crossing or hoisting of the shaft A in this position—that is, movements of the ends of the shaft—is too insignificant to cause any appreciable disadvantage.

I claim—

1. The combination consisting of the shaft A, bent levers W' W^2, toothed wheels A' and A^2, toothed wheels C' and C^2, and the shafts B' B^2, substantially as shown and described.

2. The combination consisting of the bent levers W' and W^2, shaft A, wheels A' A^2, driving-shafts B' and B^2, wheels C' C^2, brake-pulleys X' X^2, brake-band v' v^2, catches V' V^2, and springs Z' Z^2, substantially as shown and described.

3. The combination, with bent levers W' W^2, shaft A, with wheels A' A^2, shafts B' B^2, wheels C' C^2, brake-pulleys X' X^2, brake-bands v' v^2, catches V' V^2, and springs Z' Z^2, of the shedding mechanism, disks D' D^2, with crank-pins d' d^2, and picking-cams S' S^2, lifting-rods E' E^2, lathes F' F^2, picking-arms e' e^2, reeds f' and f^2 in the lathes F' and F^2, rollers H' and H^2, and beams L' L^2, substantially as shown and described.

In testimony whereof I sign this specification in the presence of two subscribing witnesses.

JAKOB FRIEDRICH HAGGENMACHER.

Witnesses:

EMIL BLUM,

WILLIAM SCHNEIDER.