No. 706,335. Patented Aug. 5, 1902.

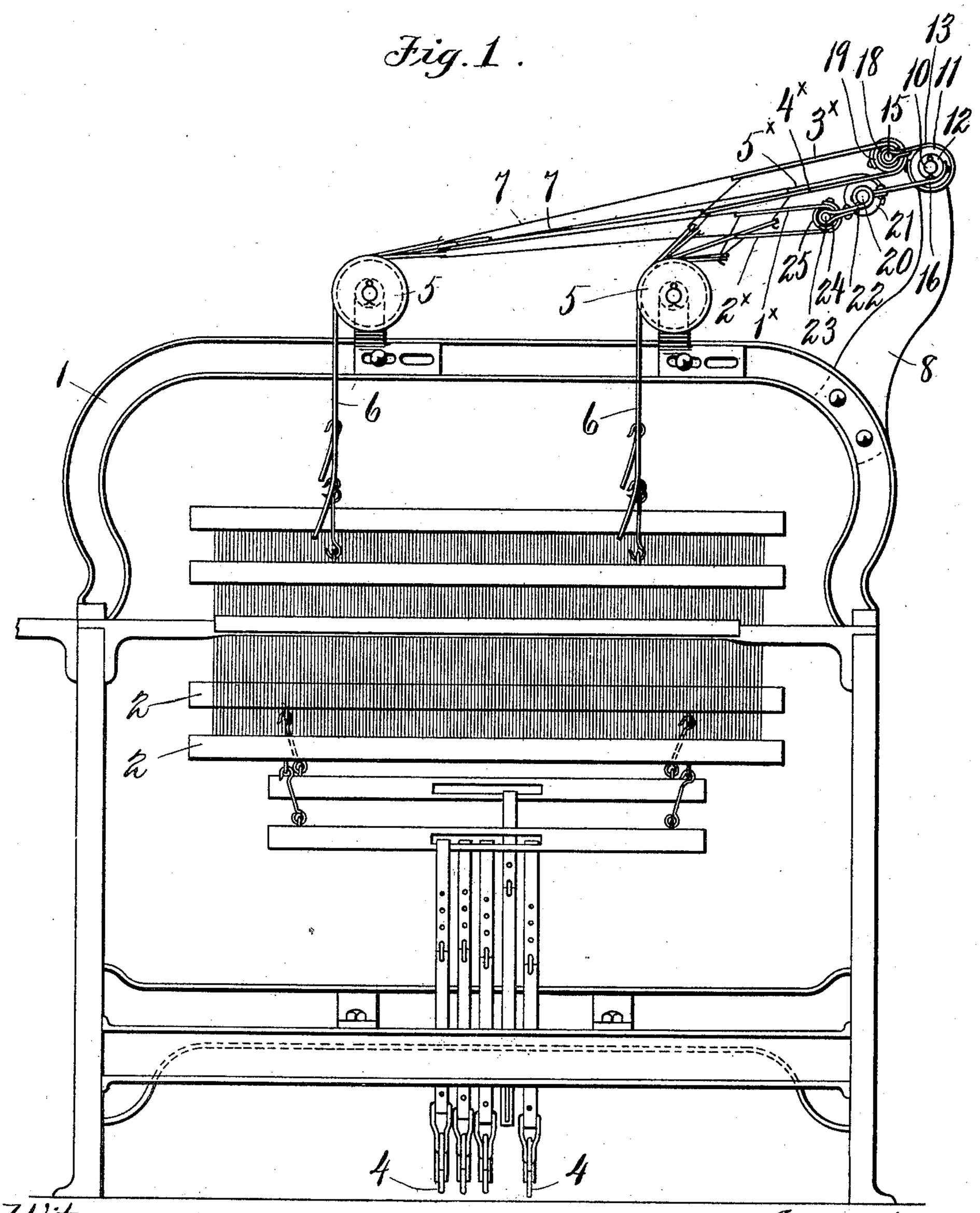
T. H. McNERNEY.

HARNESS CONTROLLING MECHANISM FOR LOOMS.

(Application filed Oct. 24, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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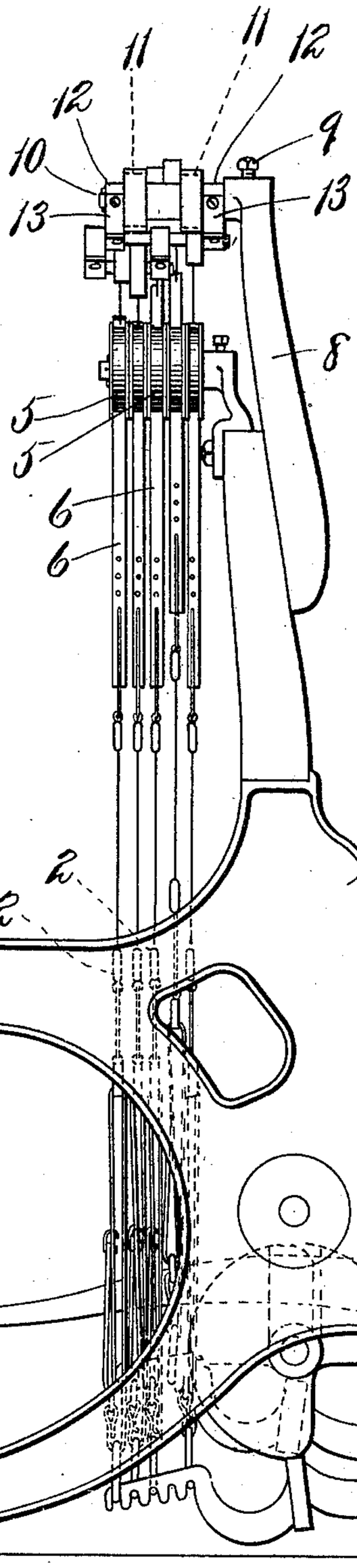

Fig. 2.

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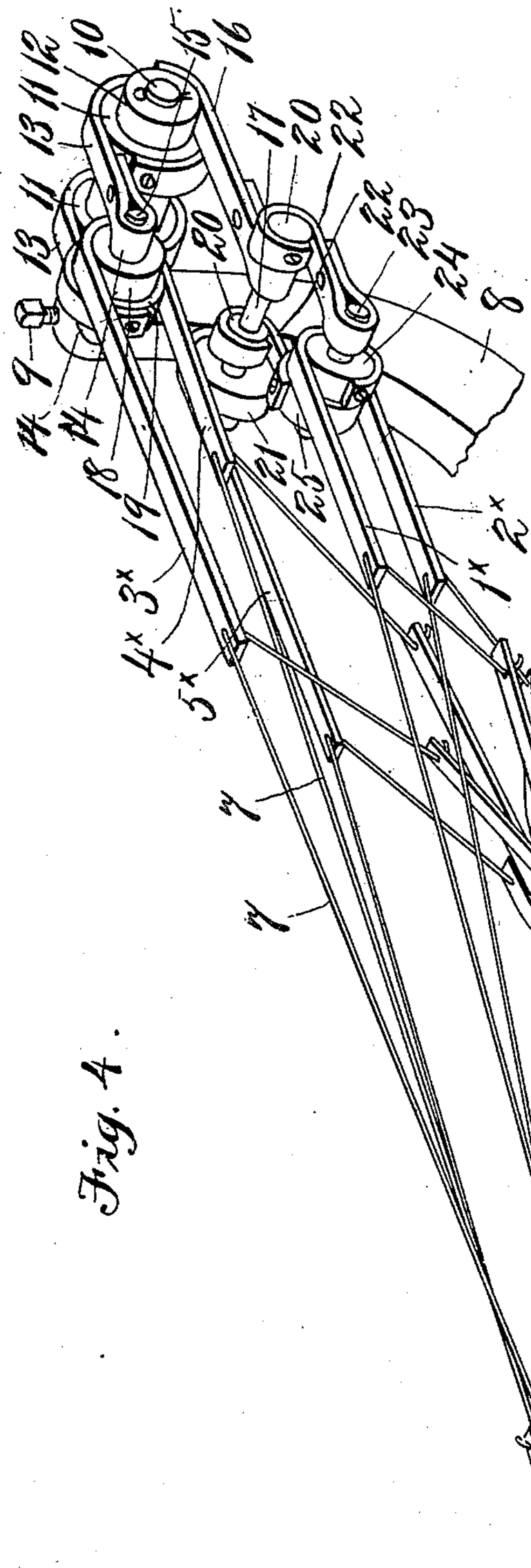

Fig. 4.

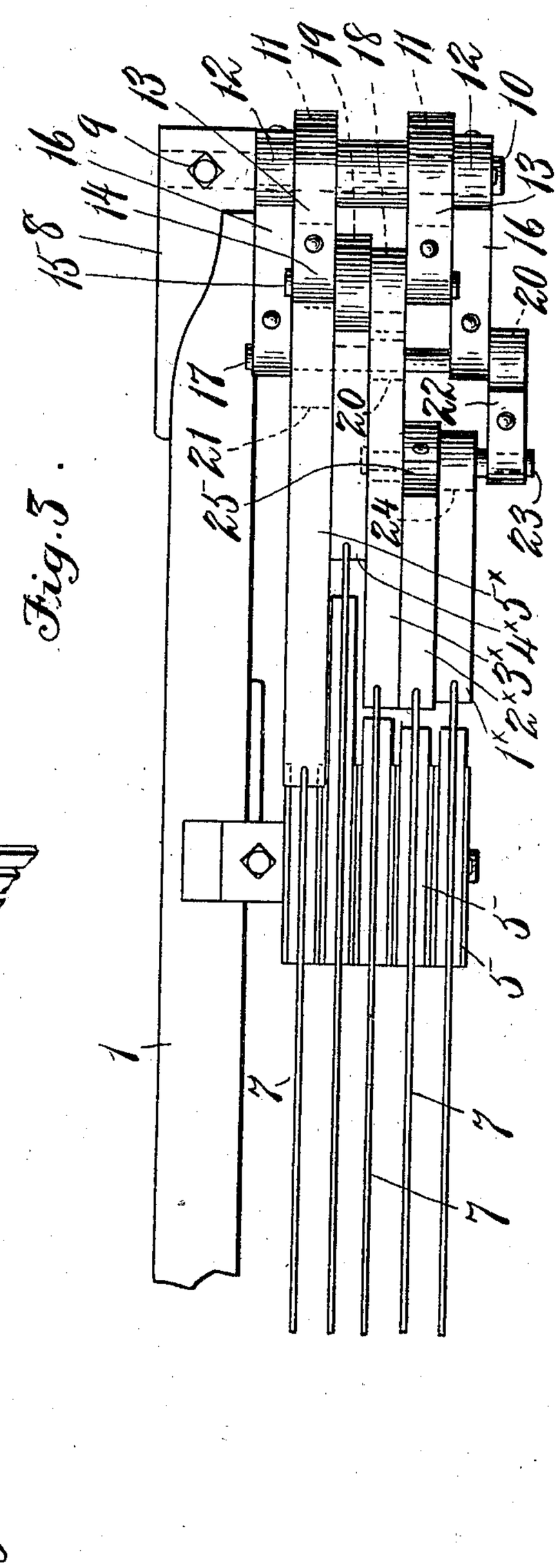

Fig. 3.

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UNITED STATES PATENT OFFICE.

THOMAS H. McNERNEY, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO SAMUEL D. LAWTON AND THOMAS F. DALEY, OF FALL RIVER, MASSACHUSETTS.

HARNESS-CONTROLLING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 706,335, dated August 5, 1902.

Application filed October 24, 1901. Serial No. 79,792. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. McNERNEY, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Harness-Controlling Mechanisms for Looms, of which the following is a specification.

This invention relates to looms in which two or more harness-frames are operated by cams or equivalent mechanism in such manner that while one of the harness-frames is moving in one direction another is always moving in the opposite direction, the other frames of the series, if such there be, remaining stationary and being operated in turn, as determined by the order and arrangement of the cams.

My invention consists in a certain novel construction and arrangement of equalizing connection between a plurality of harnesses substantially as hereinafter described and claimed, it being understood that the construction set forth is a preferred embodiment of my invention selected for the purpose of illustration and that I do not limit myself wholly to the details shown and described.

Of the accompanying drawings, Figure 1 represents a front elevation of such portions of a loom and harness-controlling mechanism as are requisite to an understanding of my invention. Fig. 2 represents a side elevation thereof. Fig. 3 represents a plan view of the equalizing connection between the harness-frames. Fig. 4 represents a perspective view of the same and the guide-rolls.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 designates the loom-frame.

2 2 are the harness-frames, here shown as five in number, though my invention is equally applicable to a greater or less number of harnesses.

3 designates the cams, and 4 designates the cam-levers, connected to the lower bars of the harness-frames. The cams 3 are so arranged on their shaft that as they revolve three of the harness-frames are always down, a fourth is always moving or about to move up to form the top of the shed, and a fifth is always moving or about to move down from the top of the shed to the bottom, the set of the cams determining the order in which the frames are selected to rise.

5 5 represent guide-pulleys arranged in two sets, with the pulleys of the respective sets located in pairs above the respective harness-frames 2 2, from which run suspending connections, including a pair of straps or cords 6 6, from each harness-frame, running over a pair of the pulleys 5 and connected to a V-wire 7, which is attached to the inner end of one of the straps or bands of the equalizing device. These straps are designated by the characters $1^{\times}$ $2^{\times}$ $3^{\times}$ $4^{\times}$ $5^{\times}$ in the order in which they are attached to the respective harness-frames, reckoning back from the front of the loom.

8 is a supporting-arm attached to one side of the loom-frame 1 and having secured to it by a set-screw 9 a horizontal shaft 10. On the shaft 10 is mounted to rotate a sleeve having formed on it two cylindrical portions or rolls 11 11 of equal diameter and two smaller cylindrical portions or rolls 12 12 of equal diameter. These rolls 11 and 12 may be termed "primary" rolls or cylinders. Around the rolls 11 11 are wrapped primary straps or bands 13 13, attached at one end to the peripheries of the rolls and having their opposite ends looped to form bearings 14 14 for the journals of a shaft 15. Wrapped in the opposite direction around the rolls 12 12 are primary straps or bands 16 16, having one end attached to the periphery of said rolls and their opposite ends looped similarly to the bands 13 to form bearings for a shaft 17. On the shaft 15 are mounted a pair of connected secondary rolls 18 19 of unequal diameter, around which the bands $3^{\times}$ and $4^{\times}$ are wrapped in opposite directions and to the peripheries of which the ends of said bands are secured, the band $3^{\times}$, which is nearer the front of the loom, being wrapped around the smaller roll 18, since the corresponding harness has a smaller amplitude of movement, being on a narrower part of the shed than the harness attached to the band $4^{\times}$. The shaft 17 has two smaller secondary rolls 20 20 and a connected larger

secondary roll 21, around the latter of which the end of the band $5^{\times}$ is wrapped and attached, and there are also two secondary bands 22 22, wrapped oppositely to the band $5^{\times}$ around and attached to the smaller rolls 20, a shaft 23, journaled in the looped ends of said bands, and a pair of tertiary rolls 24 25 of unequal diameter on said shaft, around which are oppositely wrapped and attached the ends of the bands $1^{\times}$ and $2^{\times}$, the former being wound around the smaller roll 24.

With the above construction of equalizer any two of the harness-frames may be worked in opposition without loosening or moving the suspension of the remaining frames. Thus supposing the cams to be so arranged that the frames corresponding to the bands $1^{\times}$ $3^{\times}$ $5^{\times}$ $2^{\times}$ $4^{\times}$ are raised in succession in the order named if $1^{\times}$ is up and the remaining four down as $1^{\times}$ starts to descend $3^{\times}$ will start to rise. When $3^{\times}$ is descending, $5^{\times}$ is rising, and so on. The cams increase in size corresponding to the order of the harnesses from front to rear of the loom, and the difference in amplitude of movement of the harnesses is compensated for in the different diameters of rolls in the equalizer.

My equalizer is more compact and more inexpensive in construction than any other of which I have knowledge. The location of the equalizer at the side of the loom in a position laterally remote from the harness-frames leaves the space above the cloth and the warps practically free to the inspection of the loom-tender. An inherent objection to the use of equalizers located directly above the harnesses is that they obstruct the view of the operator, and when any of the bands break the mechanism loses its support and falls down into the cloth, to the injury of the latter. With my improvement in case of a break the loose strap ends are thrown or fall to one side of the harnesses and not into the cloth.

The looped ends of the bands 13 16 22 form durable noiseless bearings for the shafts 15 17 23, which will run without continued oiling, such as is necessary in the case of a metal bearing. Thus attendance and lubricant are saved and the danger of oil creeping down the connections into the cloth is minimized, the shaft 10 being the only bearing which requires oiling, and that being located at the maximum distance from the harnesses and having no jerking movement of translation which would tend to distribute the oil.

My improved equalizer is adapted for any width of loom, because there are no fixed centers. The straps 6 6 being flexible can extend in any desired direction from the rolls 5 to the harnesses, so that any size of harness can be employed.

I claim—

In a loom harness mechanism, a plurality of vertically-moving harness-frames, guides mounted above said frames, a support and an equalizer comprising a pair of axially-alined connected primary rolls or cylinders stationarily journaled on said support in a position laterally remote from the guides, primary flexible bands wrapped around the respective rolls in opposite directions, one or more of said bands being looped to form journal-bearings, secondary pairs of axially-alined connected rolls or cylinders having journals mounted to rotate in the said bearing-loops, secondary pairs of flexible bands wrapped in opposite directions around said secondary rolls, and suspending connections between said primary and secondary bands and the harness-frames passing over said guides.

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

THOMAS H. McNERNEY.

Witnesses:
HENRY H. EARL,
HERBERT A. BORDEN.