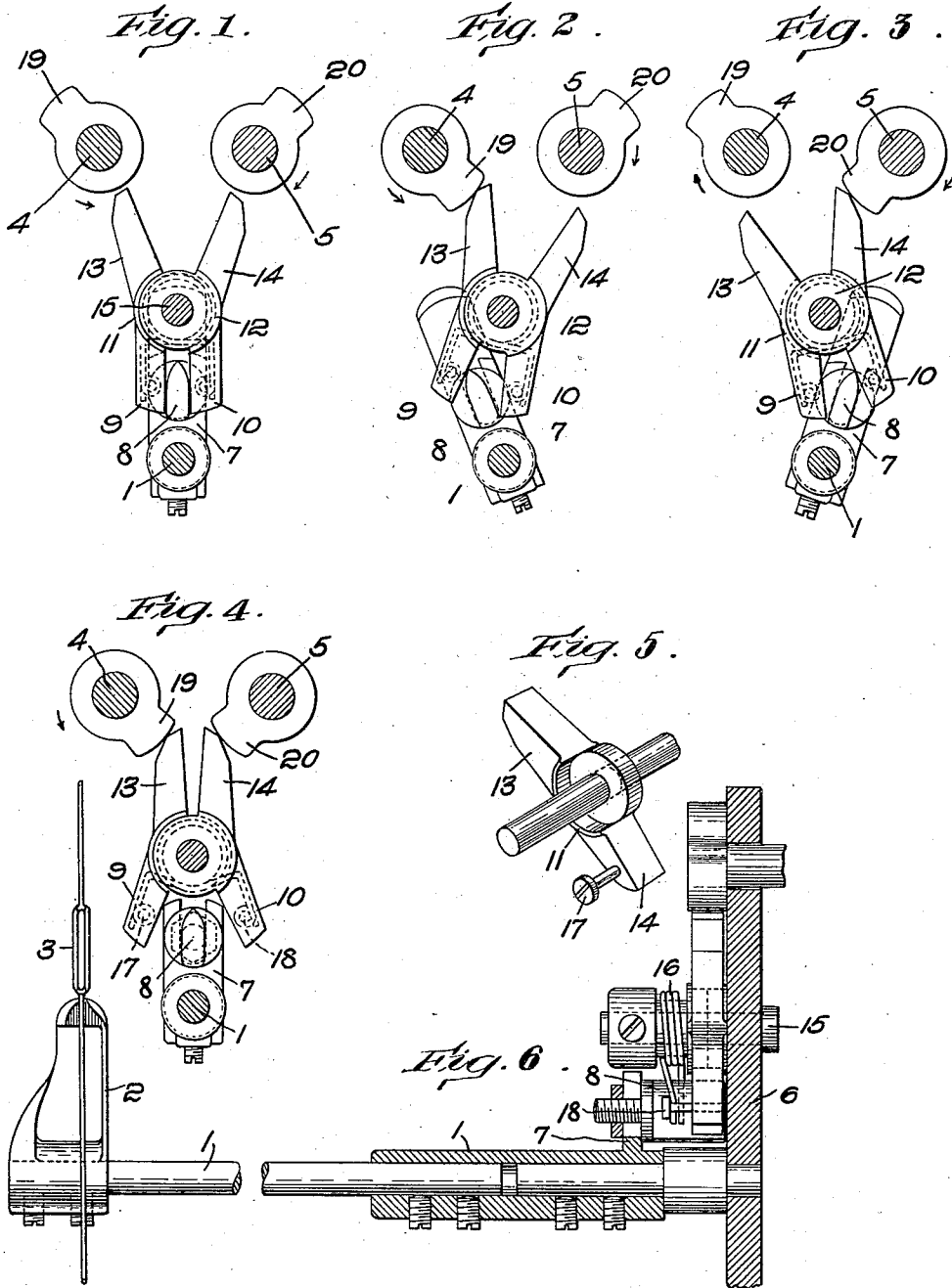


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WARP DRAWING MACHINE.
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UNITED STATES PATENT OFFICE.

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WARP-DRAWING MACHINE.

1,017,296.

Specification of Letters Patent.

Patented Feb. 13, 1912.

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To all whom it may concern:

Be it known that I, CHARLES LEA, a citizen of the United States, and a resident of Boston, county of Suffolk, State of Massachusetts, (whose post-office address is corner of Freeport and Beach streets, Dorchester, Massachusetts,) have invented an Improvement in Warp-Drawing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to warp drawing machines and more particularly though not exclusively to devices used for transmitting motion to a part or parts employed for positioning the harness eyes.

The invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings: Figure 1 is a front elevation partly in section showing one form of my invention applied to the "flipper" shaft of a warp drawing machine; Fig. 2 is a similar view showing the "flipper" shaft moved in one direction; Fig. 3 is a similar view showing the "flipper" shaft moved in the opposite direction; Fig. 4 is a similar view showing both actuating members engaging the transmitting device at the same time; Fig. 5 is a detail in perspective showing one side or arm of the transmission device; and Fig. 6 is a side elevation partly in section showing the relation of the parts illustrated in Fig. 1 to each other and to the "flipper."

Referring to the drawings and to the illustrative embodiment of the invention there shown, the same is shown applied to a transmission device for transmitting movement to the shaft 1, which latter carries at the end the centering device or flipper 2 for positioning a selected harness eye 3 and centering it squarely within the needle path. The specific form of the invention here shown is applicable to a warp drawing machine of the type shown in U. S. Patent No. 980,086 or British Patent No. 4,661 of 1904,

where two or more harness eye selecting and separating shafts 4 and 5 are utilized to actuate suitable selecting and positioning worms. The latter act to separate and feed successive heddle eyes each in its respective harness. For each semi-revolution of a harness eye separator of the type shown in said prior patents an eye in its respective harness is presented within the path of the drawing-in needle. Another semi-revolution places the harness eye out of the path of the drawing-in needle.

In the described form of machine, for each pair of harness separator shafts there is provided an oscillating shaft like the shaft 1 mounted for oscillatory movement below the shafts 4 and 5, but midway between the same. The centering device 2 carried by the said shaft is swung toward the harness eye which has been positioned by the positioning worm and caused to engage the strand thereof so that the eye is centered and positioned squarely in the needle path.

To impart the required oscillatory movement to the shaft 1 and in the required direction, the latter is journaled at one end in the carriage frame 6 and is provided with the vertically slotted lug 7 in which is fixedly clamped the finger 8 which has round or beveled sides. This finger is yieldably held between the depending centering lugs 9 and 10 carried respectively by the members 11 and 12 which latter present the upwardly directed actuating fingers 13 and 14. The members 11 and 12 are both rotatably mounted on the fixed stud shaft 15 and together constitute a yielding transmission device for turning the "flipper" shaft 1. The lower centering lugs 14 are drawn tightly against the beveled sides of the centering finger 8 by means of the coiled spring 16, which latter is coiled about the stud shaft 15 and has its ends fastened to pins 17 and 18 respectively in the centering lugs 9 and 10 so as to draw the latter toward each other. This brings the centering finger 8 in line with the axis of the shafts 1 and 15 and therefore brings the actuating fingers 13 and 14 in symmetrical relation on opposite sides of the shafts 4 and 5. The "flipper" 2 being ad-

justed into alinement with the centering pin 8, the "flipper" is also brought normally in symmetrical relation to the shafts 4 and 5 and the positioning worms carried thereby.

5 The described transmission device therefore constitutes a self-contained centering device for centering the "flipper" and the actuating fingers 13 and 14.

To oscillate the shaft 1, the shaft 4 is provided with a lug 19 and the shaft 5 with a lug 20, these shafts being oppositely rotated or partly rotated at intervals in the direction of the arrows shown. When the shaft 4 is moved to position a harness eye the lug 19 is caused to engage with the end of the finger 13 and swing the same to the position represented in Fig. 2. This serves to withdraw the abutting lug 9 from the path of the centering finger 8, permitting the oppositely disposed lug 10 which is drawn against the finger 8 by the spring 16 to follow the lug 9 and throw the centering finger and the lug 7 to the position shown in Fig. 2, in which position the "flipper" is thrown against the positioned harness eye.

It will be observed that the shaft 4 does not positively move the "flipper" shaft, but merely withdraws the abutting lug 9, the movement of the shaft being caused by a spring 16. When the shaft 5 is turned to position a harness eye, the lug 20 strikes the finger 14 and withdraws the lug 10 from the centering finger 8, causing movement of the "flipper" to take place in the opposite direction but also as before under the yielding tension of the spring 16.

In centering or positioning the heddle eyes as described by the "flipper" 2, it is desirable that the "flipper" be actuated under a yielding effort as described for the tension of successive heddle strands is not uniform and if the flipper be moved under an unyielding effort the strand if tight may be stretched thereby to such a degree as to stretch and close the eye 3. In the device shown, the strength of the spring 16 is so selected with reference to the tension required to be placed upon the heddle strands in centering the eyes that such strand tension will not be exceeded, and if an unusually tight strand is encountered when the limit of tension is reached, the "flipper" 2, the finger 8 and lug 9 or 10 will come to rest. By means of the yielding actuator a tension is placed upon the heddle strand always within a predetermined limit and herein substantially the same amount. Here-
 40 under a yielding effort as described for the
 45 shown, the strength of the spring 16 is so
 50 tension will not be exceeded, and if an unusu-
 55 By means of the yielding actuator a
 60 ent No. 958 of 1907, the movement of the
 "flipper" shaft took place in one direction
 through a rigid unyielding member and in
 the opposite direction through a member

which was adapted to yield only in the event that both members were simultaneously moved by the separator shafts and at a point representing a tension having no reference to and greatly in excess of the tension within which the heddle tension should be kept. In the event that both positioning shafts 4 and 5 are simultaneously turned as may sometimes happen through carelessness in establishing the pattern, such action is rendered harmless by the above described mechanism for the lugs 9 and 10 will merely separate and withdraw from the finger 8 as represented in Fig. 4 where the fingers 13 and 14 are shown simultaneously engaged by the respective lugs 19 and 20.

While I have herein shown for illustrative purposes one specific embodiment of the invention and one application thereof, it is to be understood that the same is not limited to the details of construction or form or relative arrangement of parts herein shown or to the application made of the invention, but that extensive departures may be made from the disclosure herein while keeping within the spirit of the invention.

Claims.

1. In a harness eye positioning apparatus, the combination with a harness eye positioning device of an actuating member and yielding means between the actuating member and the positioning device adjusted to limit the tension placed upon a positioned heddle.
2. In a harness eye positioning mechanism, the combination with a harness eye positioning device, of a shaft for actuating said device, and yieldable means for moving said shaft in either direction.
3. In a harness eye positioning mechanism, the combination with a harness eye positioning device, of means for moving the same to apply a predetermined tension to the strands.
4. In a warp drawing machine, the combination with a pair of oppositely moving actuating members, a harness positioning shaft, and means for oscillating said shaft from one or the other of said members comprising an actuator on said shaft and opposed devices spring-pressed against said actuating member and adapted to be moved by said actuating members.
5. In a warp drawing machine, the combination with a harness eye positioning member, a pair of actuating devices and a self-centering yieldable transmission means between said positioning device and said actuating devices.
6. In a harness eye positioning mechanism, the combination with a pair of oppositely rotatable shafts, of an actuating lug on each shaft, a positioning device, a shaft

therefor, and an intermediate transmission
device comprising a pair of fingers, a spring
for drawing said fingers together on oppo-
site sides of a part carried by said posi-
5 tioning shaft and lugs attached to said fin-
gers and adapted to be struck by said actu-
ating lugs, said fingers being adapted to
separate on simultaneous actuation.

In testimony whereof, I have signed my
name to this specification in the presence of 10
two subscribing witnesses.

CHARLES LEA.

Witnesses:

THOMAS B. BOOTH,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents
Washington, D. C."
