No. 712,644. Patented Nov. 4, 1902.

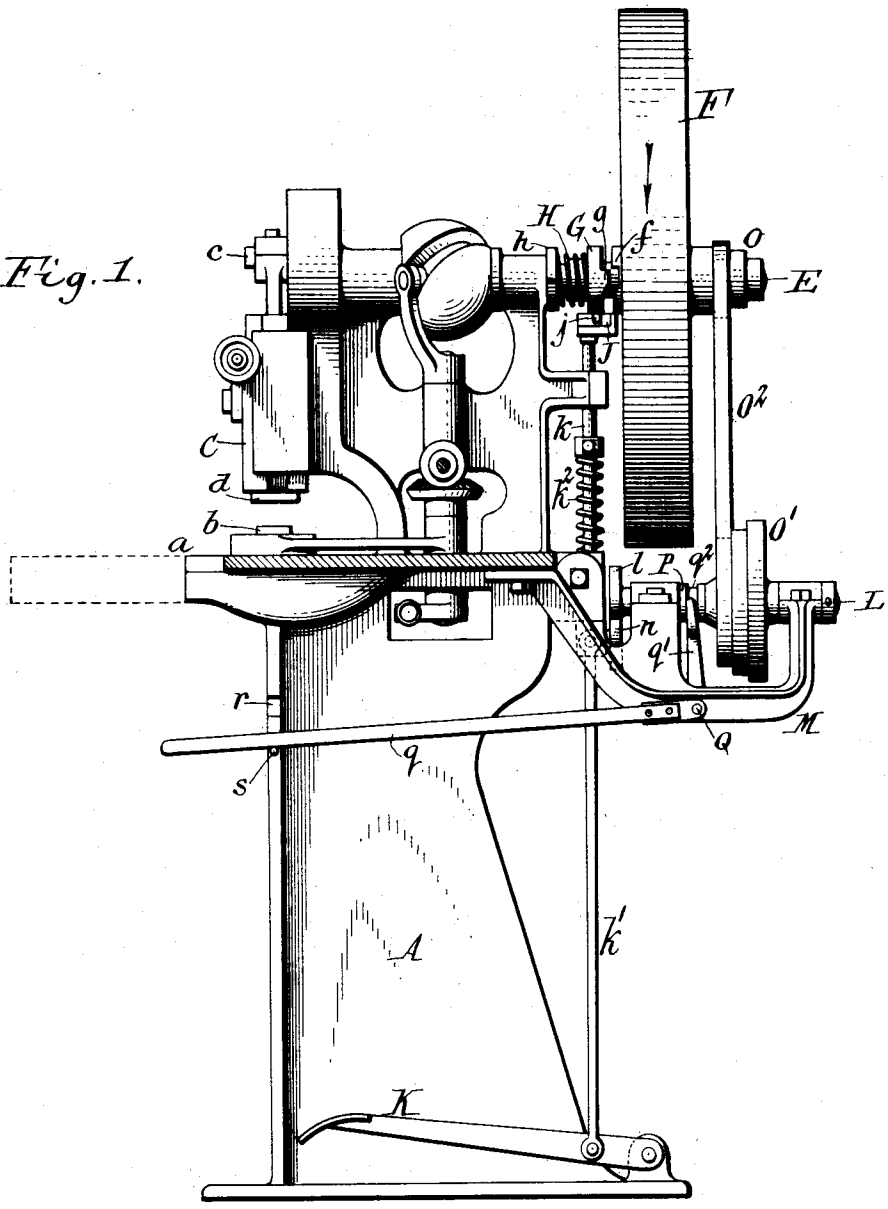
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DRIVING MECHANISM FOR EMBOSSING PRESSES.

(Application filed Dec. 9, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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DRIVING MECHANISM FOR EMBOSSING PRESSES.

(Application filed Dec. 9, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

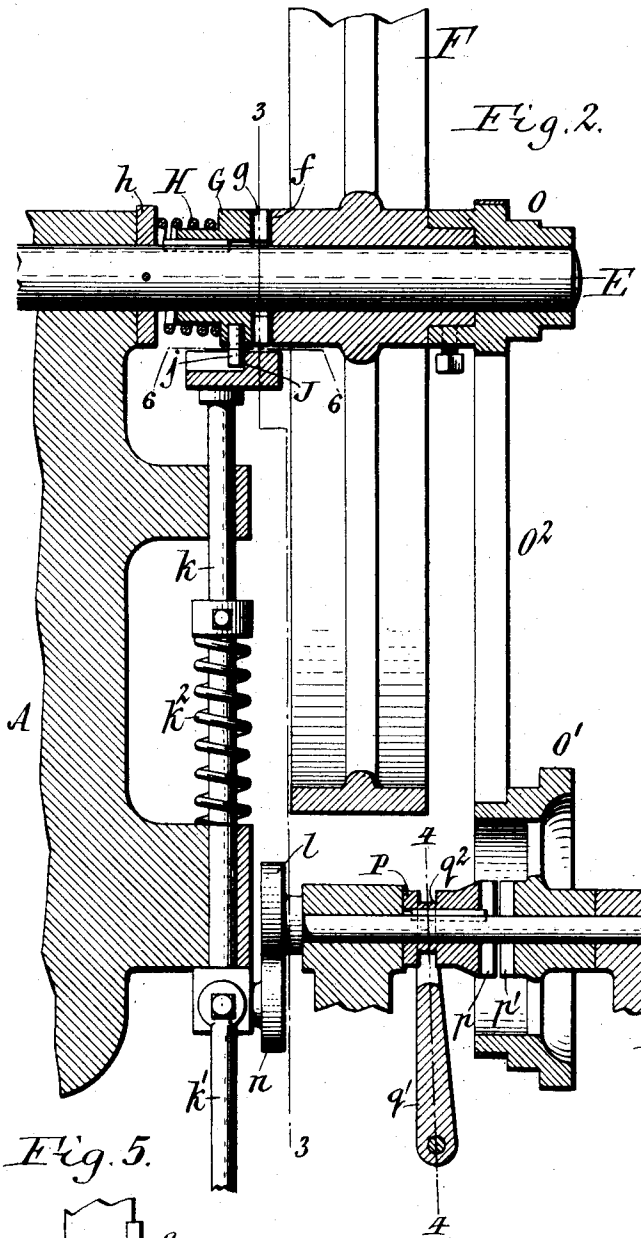


Fig. 3.

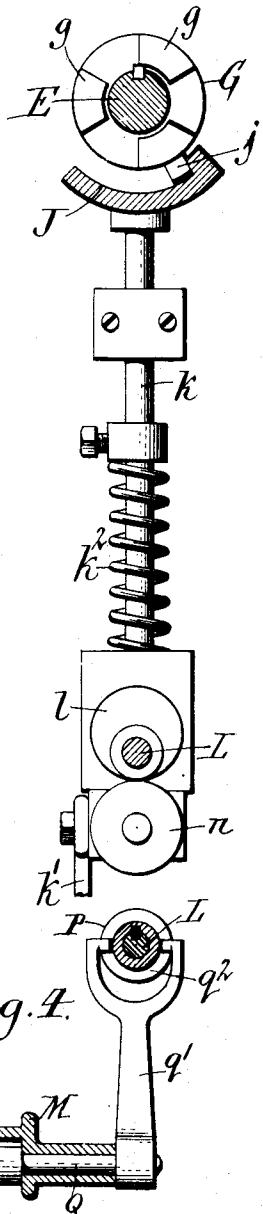


Fig. 5.

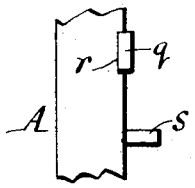


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES D. BLACKHALL, OF BUFFALO, NEW YORK.

DRIVING MECHANISM FOR EMBOSSING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 712,644, dated November 4, 1902.

Application filed December 9, 1901. Serial No. 85,215. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. BLACKHALL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Driving Mechanism for Embossing-Presses, &c., of which the following is a specification.

This invention relates to the driving mechanism of embossing-presses, &c., in which the operating mechanism and driving-shaft are connected and disconnected by a clutch or coupling device. In machines of this kind a treadle is employed by which the clutch can be operated for coupling and uncoupling the driving and operating mechanism. This clutch mechanism as heretofore constructed was so organized that upon depressing and immediately releasing the treadle the machine would perform one cycle of operations and then come to rest, or by holding the treadle in a depressed condition the operation of the machine would be continuous.

The object of this invention is to provide an auxiliary trip mechanism for automatically operating the driving-clutch of the machine, which mechanism can be used interchangeably with the treadle-operated mechanism, whereby the machine can be operated intermittently by successively depressing the treadle, or the machine can be operated continuously by the automatic trip mechanism without requiring the operator to hold the treadle in a depressed position, thereby avoiding the fatigue which otherwise results therefrom.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation, partly in section, of an embossing or stamping press provided with my improved clutch mechanism. Fig. 2 is a fragmentary sectional elevation, on an enlarged scale, of the clutch mechanism. Figs. 3 and 4 are cross-sections in lines 3 3 and 4 4, Fig. 2, respectively. Fig. 5 is a fragmentary front view showing the means for holding the hand shifting-lever in position. Fig. 6 is a horizontal section in line 6 6, Fig. 2.

Like letters of reference refer to like parts in the several figures.

The embossing-press shown in the drawings and to which my improved clutch-operating mechanism is applied consists, essentially, of a main frame A, provided on its front side with a table *a*, a die *b* arranged on the table, a vertically-movable slide C, guided on the frame above the table and provided with a counter *d*, coöperating with the die, and a driving-shaft E, journaled horizontally in the upper part of the frame and provided at its front end with a crank *c*, whereby the slide is operated.

F represents the main driving-wheel, mounted loosely on the driving-shaft in rear of the main frame. The driving-wheel is rotated constantly by a driving-belt passing around the same in a well-known manner, and the driving shaft and wheel are coupled and uncoupled for driving the machine or stopping the same by a clutch of any suitable construction. The clutch for this purpose shown in the drawings consists of a clutch-sleeve G, splined on the driving-shaft between the frame and the driving-wheel and provided on its outer end with clutch-jaws *g*, which are engaged with and disengaged from clutch-jaws *f* on the inner end of the driving-wheel hub.

H represents a spring which is mounted on the driving-shaft between the clutch-sleeve and a collar *h* on the shaft and which moves the clutch-sleeve, when the same is free, outwardly into engagement with the driving-wheel, thereby coupling the driving wheel and shaft and causing the press to be operated. The clutch-sleeve is moved inwardly for disengaging its jaws from those of the driving-wheel and stopping the operation of the press by a cam J, which is engaged by a shifting lug or pin *j* on the under side of the clutch-sleeve. This cam is mounted on the upper end of a vertically-sliding rod *k*, which is guided on the main frame and connected at its lower end by a rod *k'* with a treadle K, which is pivoted on the base of the frame. The sliding rod *k* and connecting parts are normally held in an elevated position by a spring k^3, so that the cam stands in the path of the shifting pin *j* and uncouples the clutch. Upon depressing the treadle and immediately releasing the same the cam clears the shifting pin *j*, thereby permitting the spring H to couple the clutch for operating the machine, and when the driving-shaft and connecting

parts make one complete turn the shifting pin *j* engages the clutch-cam J and the clutch-sleeve is uncoupled from the driving-wheel, thereby stopping the machine.

In order to cause the machine to operate continuously without requiring the attendant to hold the treadle in a depressed position, an auxiliary trip mechanism is provided which automatically depresses the clutch-cam and causes the press to operate at regular intervals. This auxiliary trip mechanism is constructed as follows:

L represents a counter-shaft journaled in a bracket M on the lower rear part of the main frame parallel with the driving-shaft. This shaft is provided at its inner end with a trip-cam *l*, which engages against the upper side of a roller *n* on the lower end of the shifting rod *k*. When the high part of the cam *l* engages the roller *n*, the latter and the parts connected therewith are depressed, whereby the clutch-sleeve G is released for coupling the driving wheel and shaft, and when the low part of the trip-cam *l* faces the roller *n* the spring k^3 raises the same and connecting parts for bringing the clutch-cam G into its operative position, in which the latter again uncouples the driving-shaft from the driving-wheel.

O represents a cone-pulley connected with the rear end of the driving-wheel hub, O′ a cone-pulley mounted loosely on the counter-shaft, and O^2 a belt passing around the pulleys O O′.

P represents a clutch collar or sleeve splined on the counter-shaft and provided at its outer end with clutch teeth or jaws *p*, adapted to engage with similar teeth or jaws *p′* on the inner side of the driven cone-pulley O′.

q q′ represent the two arms of a hand-lever, whereby the clutch-sleeve P is shifted into its operative or inoperative position. These arms are secured to opposite ends of a rock-shaft Q, which is journaled transversely in the lower part of the bracket M. The rear arm *q′* of the hand-lever projects upwardly from the rock-shaft and engages with its forked upper end in a circumferential groove q^2 in the clutch-sleeve P. The front arm of the hand-lever projects forwardly from the rock-shaft underneath the table and within convenient reach of the attendant. Upon raising the front arm of the shifting lever its rear arm moves the clutch-sleeve P into engagement with the lower cone-pulley O′ and couples the same with the counter-shaft, thereby causing the trip-cam to be turned with the driving-wheel through the medium of the intermediate connecting mechanism. While the trip-cam is thus coupled with the driving mechanism and rotated continuously thereby, the same trips the main clutch automatically at regular intervals. The auxiliary clutch is held in its coupled position by engaging the front arm *q* of the hand-lever with a notch *r* in the front part of the frame, as shown in Fig. 5. Upon disengaging the front arm of the hand-lever from this notch and depressing the same the clutch-sleeve P will be disengaged from the lower cone-pulley O′, thereby stopping the rotation of the trip-cam and the automatic coupling of the main driving-clutch. The downward movement of the front arm of the trip-lever is limited by a stop *s*, as shown in Fig. 1. By shifting the belt O^2 from one pair of steps on the cone-pulleys O O′ to another the speed of the trip-cam can be varied for increasing or decreasing the length of the intervals between the automatic tripping operations of the main clutch, thereby permitting the speed of the machine to be adapted to the character of the work and to the rapidity or skill of the attendant in feeding the machine. It will thus be observed that by the use of my improvement the main driving-clutch can be operated not only manually at will by the usual treadle mechanism or automatic continuously, but the intervals between the automatic operations can also be varied.

In the stamping-presses and similar machines as heretofore constructed continuous and regular operation of the machine could only be produced by holding the treadle in a depressed position; but no variation between the intervals of operations was possible nor was it practical to run the machine in this manner owing to the high speed at which the driving-wheels of this class of machines are usually rotated. When the press is operated at the will of the attendant, the intervals between the operations are irregular and necessitate running the press at a comparatively high speed in order to obtain the full capacity of the same. By the employment of this automatic tripping mechanism for the driving-clutch the speed of the press can be reduced considerably without reducing the output of the press, because the attendant is able to keep up with the press and is more likely to feed the press regularly for each operation.

I claim as my invention—

1. The combination of a driving device, a driven mechanism, a coupling device interposed between the driving device and the driven mechanism, a shifting mechanism for said coupling device, and a speed-reducing mechanism which is driven from said driving device and which drives said shifting mechanism, substantially as set forth.

2. The combination of a driving device, a driven mechanism, a coupling device interposed between the driving device and the driven mechanism, a shifting mechanism for said coupling device, and a variable-speed-reducing mechanism which is driven from said driving device and which drives said shifting mechanism, substantially as set forth.

3. The combination of a driving device, a driven mechanism, a coupling device interposed between the driving device and the driven mechanism, a manual trip mechanism

for actuating the coupling device, and an automatic trip mechanism which is driven from the driving device and constructed to actuate the coupling device, substantially as set forth.

4. The combination of a driving device, a driven mechanism, a coupling device interposed between the driving device and the driven mechanism, a manual trip mechanism for the coupling device, and a variable automatic trip mechanism which is driven from the driving device and constructed to actuate the coupling device, substantially as set forth.

5. The combination of a driving device, a driven mechanism, a coupling device interposed between the driving device and the driven mechanism, an automatic trip mechanism which is driven from the driving device and constructed to actuate the coupling device, and an auxiliary coupling device whereby said automatic trip mechanism may be rendered operative or inoperative, substantially as set forth.

6. The combination of a driving-shaft, a driving-wheel, a main clutch interposed between said members, a trip-cam whereby said clutch is operated, intermediate driving mechanism for operating said cam from said driving-wheel, and an auxiliary clutch arranged in said cam-driving mechanism, substantially as set forth.

7. The combination of a driving-shaft, a driving-wheel, a main clutch interposed between said shaft and said wheel, a controlling member for said clutch, a manual actuating device connected with said controlling member, and an automatic actuating device driven from said driving-wheel and also operating upon said controlling member, substantially as set forth.

8. The combination of a driving-shaft, a driving-wheel having a pulley, a main clutch interposed between said driving-shaft and said wheel, a controlling member for said clutch, a counter-shaft provided with a loose pulley and a cam which operates upon said controlling member, a belt running around said pulleys, and an auxiliary clutch interposed between said counter-shaft and its pulley, substantially as set forth.

9. The combination of a driving-shaft, a driving-wheel having a cone-pulley, a main clutch interposed between said driving-shaft and said wheel, a controlling member for said clutch, a counter-shaft provided with a loose cone-pulley and a cam which operates upon said controlling member, a belt running around said pulleys, and an auxiliary clutch interposed between said counter-shaft and its pulley, substantially as set forth.

10. The combination of a driving-shaft, a driving-wheel having a pulley, a main clutch interposed between said shaft and said wheel, an uncoupling-cam controlling said clutch, a shifting rod connected with said cam and provided with a roller, a counter-shaft having a loose pulley and a trip-cam engaging said roller, a belt passing around said pulleys, and an auxiliary clutch interposed between the counter-shaft and its pulley, substantially as set forth.

11. The combination of a driving-shaft, a driving-wheel having a pulley, a main clutch interposed between said shaft and said wheel, an uncoupling-cam controlling said clutch, a shifting rod connected with said cam and provided with a roller, a treadle connected with said shifting rod, a counter-shaft having a loose pulley and a trip-cam engaging said roller, a belt passing around said pulleys, an auxiliary clutch interposed between said counter-shaft and its pulley, and a hand-lever for operating said auxiliary clutch, substantially as set forth.

Witness my hand this 4th day of December, 1901.

CHARLES D. BLACKHALL.

Witnesses:
THEO. L. POPP,
CARL F. GEYER..