No. 749,036. PATENTED JAN. 5, 1904.

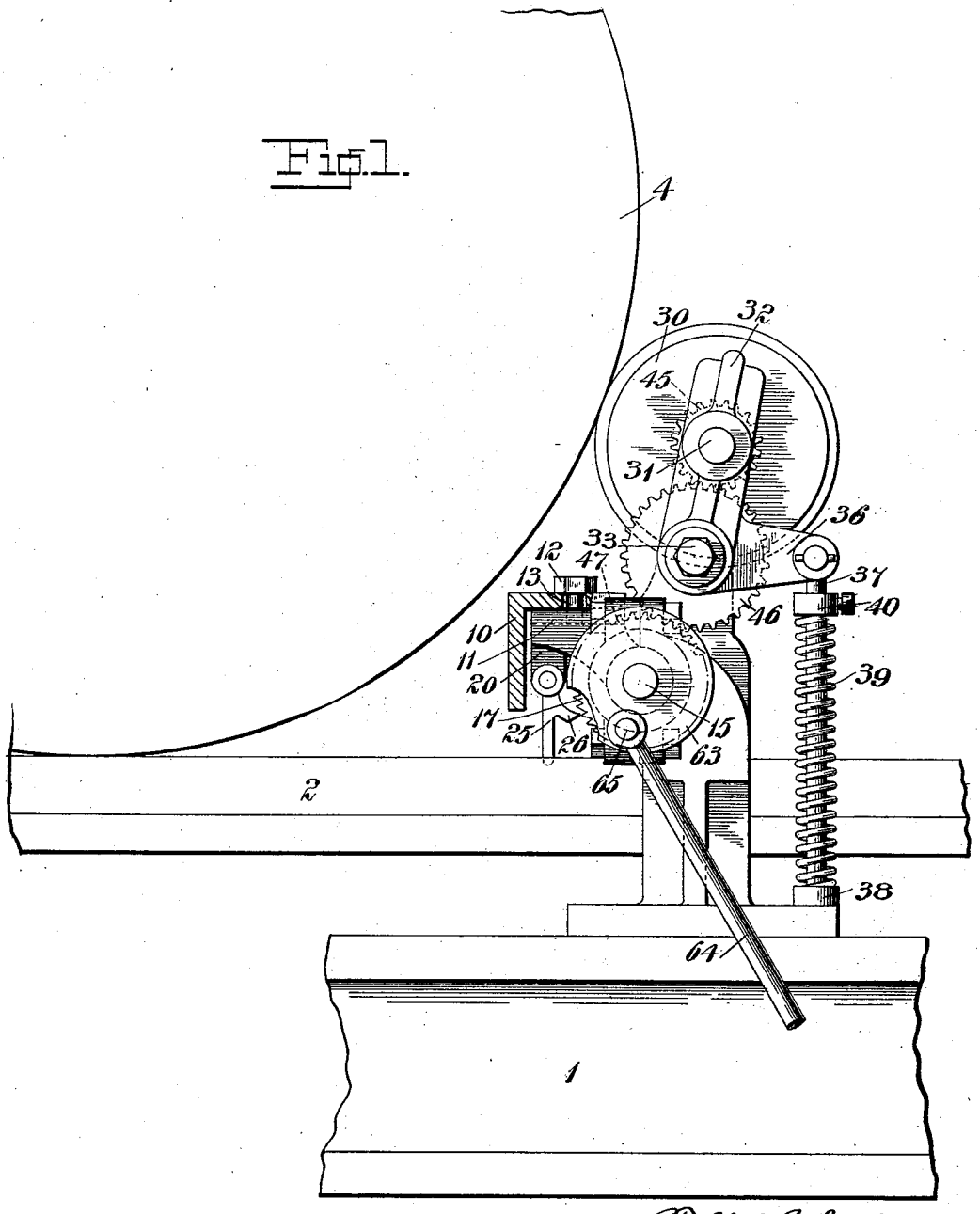
T. C. DEXTER & H. HALLSTREAM.

AUTOMATIC CONTROLLING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED JULY 28, 1902.

NO MODEL. 4 SHEETS—SHEET 1

Fig. 1.



Witnesses
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By their Attorneys Knight Bros.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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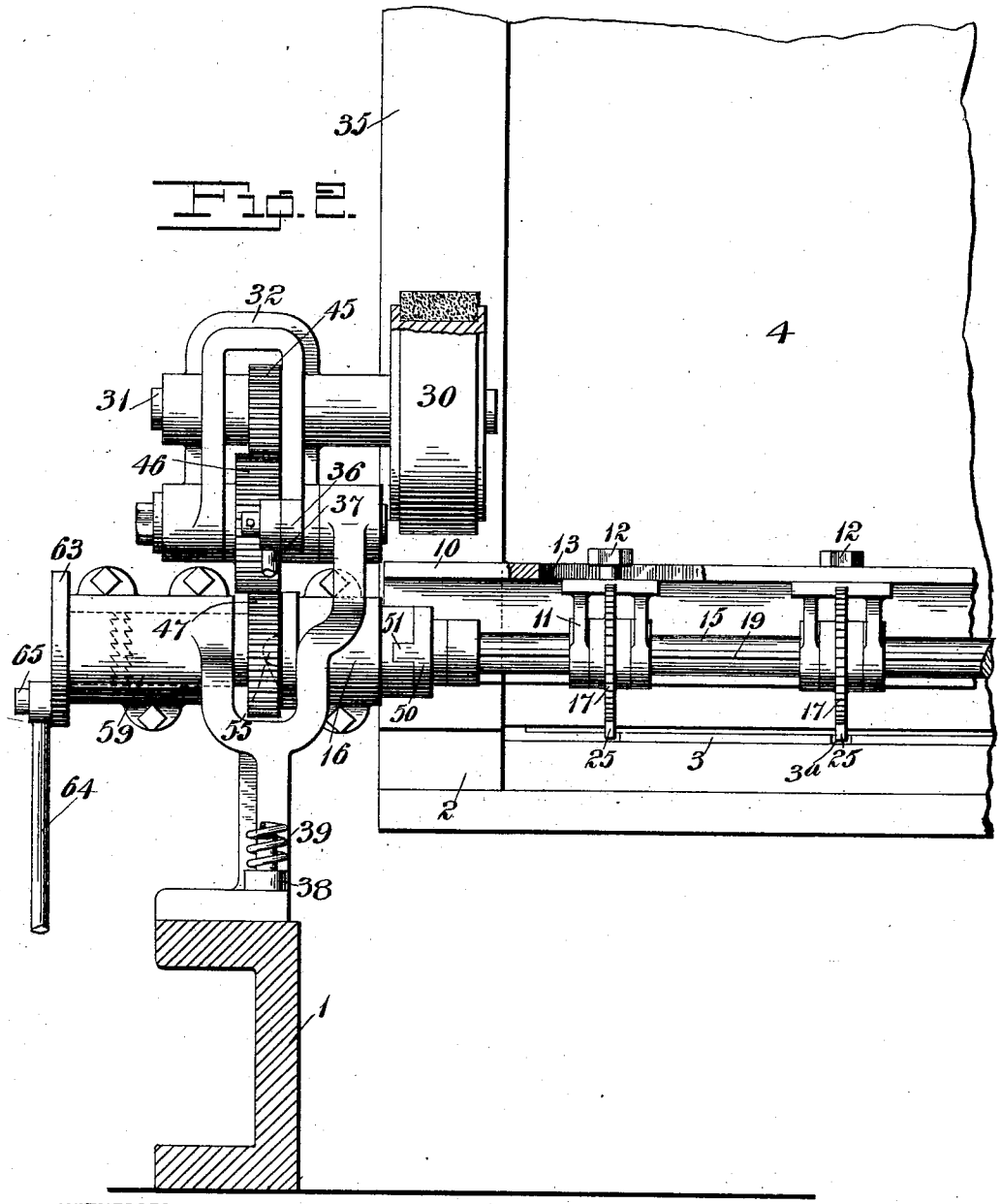
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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



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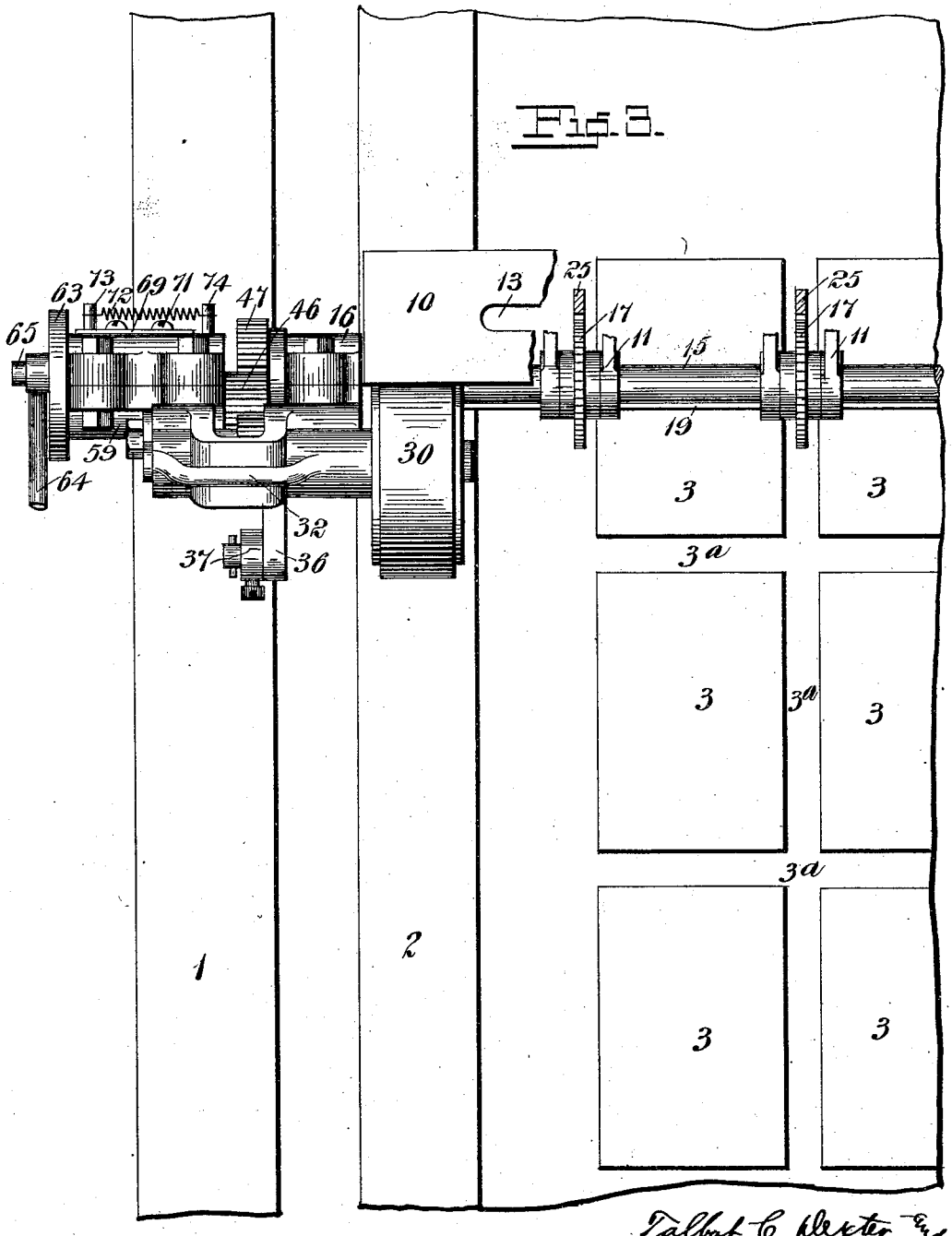
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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3.



Witnesses
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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 4

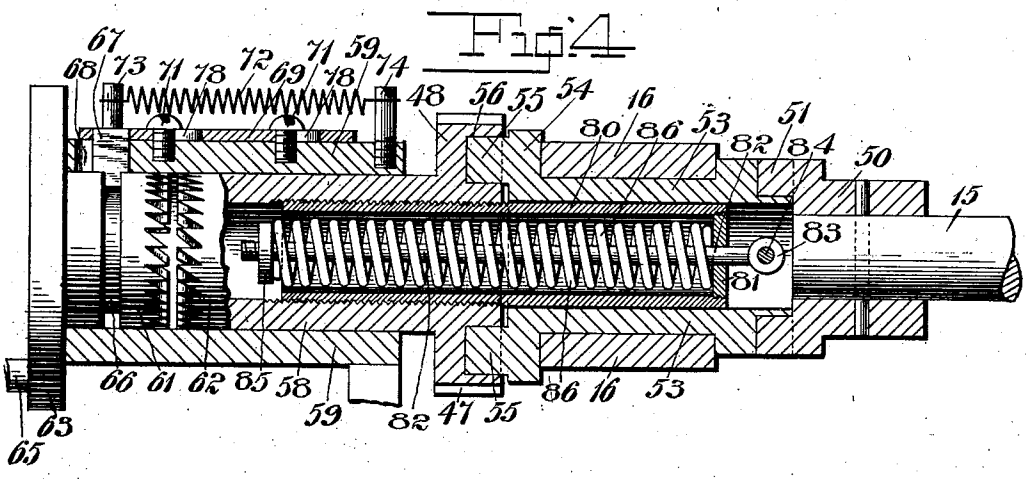


Fig. 5

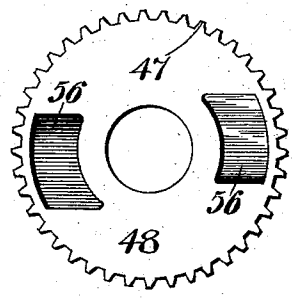


Fig. 6

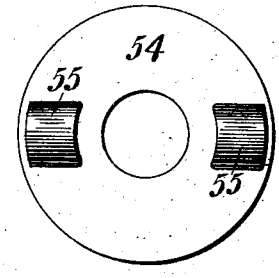
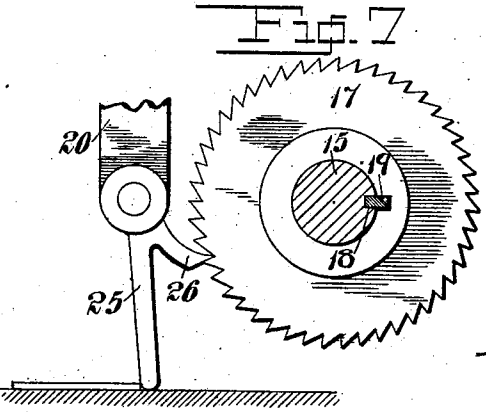


Fig. 7



Witnesses
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No. 749,036. Patented January 5, 1904.

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER AND HENRY HALLSTREAM, OF PEARL RIVER, NEW YORK; SAID HALLSTREAM ASSIGNOR TO SAID DEXTER.

AUTOMATIC CONTROLLING MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 749,036, dated January 5, 1904.

Application filed July 28, 1902. Serial No. 117,331. (No model.)

To all whom it may concern:

Be it known that we, TALBOT C. DEXTER and HENRY HALLSTREAM, both citizens of the United States, residing at Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Automatic Controlling Mechanism for Printing-Presses and other Machines Designed to Operate upon Sheets of Paper, of which the following is a specification.

Considerable difficulty has been encountered in the operation of printing-presses by reason of the sheets of paper sticking to the printing-form and tearing away from the impression-cylinder, parts of the sheets so sticking to the form being carried back by the form and deposited upon the inking-rollers. When heavy pieces of paper are deposited between the inking-rollers, they not only interfere with the operation of inking the form, but sometimes injure the inking-rollers and other parts of the press. When such an accident happens to a printing-press, it is necessary to stop the press and carefully extract all particles of paper which have become clogged between the inking-rollers and form, and as such an operation is very tedious there is a great loss of valuable time. Such accidents are particularly apt to happen when printing large masses of solid color upon a cheap grade of paper, which is sometimes too weak to stand the strain of pulling away from the form after the impression by the action of the impression-cylinder.

To obviate the danger to the press and avoid the objectionable delays incident to the removal of pieces of paper that become clogged between the parts of the press, we have devised a simple arrangement for automatically arresting the operation of the press whenever a piece of paper adheres to the printing-form and is torn from the impression-cylinder.

In most printing-forms the printing-surfaces are arranged in rectangular blocks with valleys or channels between them, said valleys or channels corresponding with the margins or blank portions left in the printed sheets. We propose to arrange transversely of the press a plurality of tripping-fingers which project a trifle beneath the plane of the printing-surface of the form into these valleys or channels and provide suitable mechanism controlled by said tripping-fingers for arresting the operation of the press. Each of the tripping-fingers carries a pawl or dog which is adapted to be moved into positive engagement with one of a series of ratchet-wheels keyed to a constantly-rotating shaft, said shaft being suitably geared to a driving mechanism. Interposed between the constantly-rotating ratchet-wheel shaft and its driving mechanism is a clutch comprising two relatively movable members, one of which is formed with radially-extending cam-sockets, while the other one of which is formed with radially-extending shoulders or pins which engage normally in the sockets of the first-named member. A suitable spring holds these clutch members normally in engagement. The movable clutch member is adapted to rotate forwardly on its supporting-shaft when the rotation of the shaft is arrested by one of the trip-fingers engaging one of the ratchet-wheels, and its forward rotation relatively to its shaft causes the interlocking cam-sockets and shoulders of the clutch members to force the movable clutch member outwardly (longitudinally of the shaft) into engagement with a part of the press throw-out mechanism. When a sheet or part of a sheet of paper adheres to the printing-form, it will, if sufficiently large to cause any disturbance, in all probability extend across one of the longitudinal channels or valleys of the form, so that when the form advances past the impression-cylinder the piece of sheet which is adhering to the form will engage one of the tripping-fingers and throw the dog into engagement with its controlled ratchet-wheel, resulting in the instantaneous stopping of the shaft upon which the ratchet-wheel is mounted and a relative rotary and longitudinal movement between the fixed and movable members of the clutch. This relative movement between the clutch members throws the press throw-out mechanism into gear with the driving mechanism of the controlling device, and the press is thereby immediately stopped before the sheet or part of sheet

which went wrong can be carried back to the inking-rollers.

In order that our invention may be fully understood, we will first describe the same with reference to the accompanying drawings and afterward point out the novelty with more particularity in the annexed claims.

In the accompanying drawings, Figure 1 is a detail side elevation of our improved tripping mechanism applied to a flat-bed printing-press. Fig. 2 is a transverse vertical sectional view of the same. Fig. 3 is a plan view of the same, the impression-cylinder of the press being omitted. Fig. 4 is a detail longitudinal sectional elevation of the clutch mechanism. Figs. 5 and 6 are inside face views of the movable and fixed members of the clutch. Fig. 7 is a detail elevation of one of the tripping devices and its controlled ratchet-wheel.

1 is the frame of an ordinary flat-bed printing-press.

2 is the reciprocating bed, and 3 represents an ordinary printing-form mounted upon the bed 2 and having the channels or valleys 3^a, separating the printing-blocks or parts of the form.

4 represents the impression-cylinder of the printing-press.

Mounted transversely of the press upon the press-frame 1 between the impression-cylinder 4 and the reciprocating bed 2 and beyond the line of impression is an angle-iron bracket 10, upon which are adjustably secured a series of yokes 11. The yokes 11 are secured to the bracket 10 in the desired adjusted position by means of screw-bolts 12, which pass through a slot 13 in bracket 10 and are threaded into openings formed in the yokes 11. A shaft 15, journaled in suitable bearings 16, extends parallel to the bracket 10 and passes freely through suitable openings formed in the arms of yokes 11. Ratchet-wheels 17 are mounted upon the shaft 15 between the arms of yokes 11, each ratchet-wheel being formed with a key-groove 18, that engages the key 19, fixed on the shaft 15.

Freely journaled upon bracket-arms 20, extending from the yokes 11, are the tripping-fingers 25, each one of which is formed with a pawl or dog 26, extending toward the toothed periphery of one of the ratchet-wheels 17. These tripping-fingers 25 hang by gravity from their journals and project slightly below the surface of the printing-form into the valleys or channels 3^a.

30 is a frictional driving-wheel keyed to a shaft 31, which is freely journaled in a yoke-shaped bracket 32, pivotally mounted at 33. This friction-wheel 30 operates in peripheral engagement with the outer rim 35 of the impression-cylinder 4 of the printing-press, and to hold it yieldingly in contact with the rim of the impression-cylinder an arm 36 is formed on the pivoted bracket 32, and a spring-actuated rod 37 is journaled to arm 36 and passes down through a guide-opening 38 in the press-frame and supports an extension-spring 39, which is confined upon the rod 37 by means of an adjustable collar 40.

The shaft 31 of the driving-wheel 30 has keyed to it a small gear 45, which is in mesh with a larger and broader gear 46, journaled freely upon the pivot-shaft 33. This wide gear 46 meshes with a narrow-faced gear 47, formed on the movable member 48 of the slip-clutch, which we will now describe.

The outer end of the shaft 15 has pinned to it a collar 50, formed with lugs 51, which engage in the radial notches 52, formed in the sleeve 53, which is journaled in the bearing 16 and formed with an enlargement or head 54, which constitutes the fixed member of the clutch. The outer face of the fixed clutch member 53 is formed with radially-extending lugs or projections 55, which normally engage in the corresponding cam-recesses 56, formed in the inner face of the movable clutch member 48. This clutch member 48 is formed with a tubular extension 58, which is journaled freely in the bearing 59, and the outer end of the tubular extension 58 is formed with angular clutch-teeth 60, which are adapted to engage the corresponding clutch-teeth 61 of a rotary clutch member 62, freely journaled in bearing 59 in line with extension 58. Auxiliary clutch member 62 is secured to the throw-out-operating disk 63, to which the throw-out-operating link 64 is eccentrically pivoted at 65. The clutch member 62 and disk 63 are free to move outwardly slightly when clutch member 48 58 is forced toward them. Clutch member 62 is formed with an annular groove 66, in which engages a pin 67, projecting through slot 68 in bearing 59 and mounted upon a slide-bar 69. This slide-bar 69 is formed with slots 70, in which engage set-screws 71, threaded into the bearing 59. A spring 72 connects pin 73 of slide 69 with stationary pin 74 on bearing 59 to hold slide 69, pin 67, and the engaged clutch member 62 in their normal inner position, as shown in Fig. 4 of the drawings. When clutch member 48 58 is forced outwardly, the clutch member 62 can yield sufficiently to insure clutch-teeth 60 effectively interlocking with clutch-teeth 61. The clutch member 48 also carries a tube 80, which may be suitably secured thereto. Tube 80 is shown as threaded into member 48 and tubular extension 58 and is extended from member 48 into sleeve 53 of fixed clutch member 54. A head or plug 81 closes the inner end of tube 80, and a rod 82 projects through a central opening in plug 81 and is formed at one end with an eye 83, through which passes a pin 84 for securing rod 83 to the sleeve 53 of the fixed member of the main clutch. The outer end of rod 82 is threaded to receive adjustable head or nut 85, and surrounding rod 82 and confined between head 85 and plug 81 is a spring 86. This spring device is for the purpose of holding movable clutch member 48 normally in engagement

with fixed clutch member 54 and at the same time allow relative movement between the clutch members.

The purpose of having a wide-faced driving-gear 46 operating a narrow-faced gear 47 is to maintain said gears in mesh in either position of clutch member 48.

The operation of our throw-out mechanism will be understood with but a few words of explanation. If during the operation of the printing-press a piece of a sheet of paper should adhere to the form and project across one of the longitudinal valleys or channels in the form, said piece of a sheet will engage one of the tripping-fingers 25 and force it into engagement with the controlled ratchet-wheel 17, the shaft 15, carrying the ratchet-wheels 17, being constantly rotated through friction-wheel 30, gears 45 46 47 and the main clutch described. When, therefore, the pawl or dog of one of the tripping-fingers engages one of the ratchet-wheels 17, the shaft 15 will be immediately stopped, and as the movable clutch member 48 is positively driven by the friction-wheel 30 and intervening gears the clutch member 48 will continue to rotate forwardly for a partial revolution, the camfaces of the recesses 56 riding upon the projections 55 and forcing the tubular extension 58 outwardly to throw auxiliary clutch-teeth 60 into engagement with clutch-teeth 61, with the result that the throw-out operating-disk 63 will be rotated sufficiently to arrest the operation of the press. This stopping of the press is accomplished so quickly by this mechanism that the objectionable piece of paper can be removed before the reciprocating bed again passes beneath the impression-cylinder on its return movement. By the time the motion of the press has been stopped the movable member 48 of the clutch will have made half a revolution and will again slip into normal clutched position and disengage the auxiliary clutch 60 and 61 in readiness for starting up the press again. Any suitable form of throw-out mechanism for the press may be employed under the control of our improved tripping mechanism.

While we have illustrated and described our invention as applied to printing-presses, this being one of its most important applications, we do not intend to limit our invention to this specific use. It will be clear that our controlling mechanism may be applied to any machine which is designed to operate upon sheets of paper to arrest the operation of the machine under certain prearranged conditions of the sheets of paper which actuate the mechanism. The sheets may actuate the controlling mechanism by direct engagement with the tripping-fingers, as shown and described, or they may operate through any suitable intervening devices without departing from the spirit and scope of our invention.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft carrying a ratchet-wheel, means, operated by the stopping of said shaft, for operating the throw-out mechanism, and a tripping-finger supported in the path of the sheets which move it into engagement with said ratchet-wheel, thereby stopping the rotation of said rotary shaft.

2. In a printing-press, the combination of suitable throw-out mechanism, with a rotary shaft carrying a ratchet-wheel, means, operated by the stopping of said shaft, for actuating the throw-out mechanism, and a tripping-finger supported adjacent to, and projecting below the surface of, the printing-form, and adapted to be engaged by a piece of paper adhering to the form and be moved thereby into engagement with the ratchet-wheel to arrest the rotation of said shaft, substantially as set forth.

3. In a printing-press, the combination of suitable throw-out mechanism, with a rotary shaft carrying a plurality of ratchet-wheels, means, operated by the stopping of said shaft, for actuating the throw-out mechanism, and a plurality of tripping-fingers supported adjacent to and projecting below the surface of the printing-form, each of said tripping-fingers being adapted to be engaged by a piece of paper adhering to the form and be moved thereby into engagement with one of the ratchet-wheels to arrest the rotation of said shaft, substantially as set forth.

4. In a printing-press, the combination of a reciprocating printing-form having channels or valleys extending through its surface and suitable press-throw-out mechanism, with a rotary shaft extending transversely of the direction of travel of the form, a plurality of ratchet-wheels mounted upon said shaft, a plurality of tripping-fingers supported adjacent to the ratchet-wheels in the planes of the channels or valleys of the form and projecting beneath the surface of the form, ratchet-engaging pawls or dogs carried by said tripping-fingers, and means, operated by the stopping of said shaft, for actuating the throw-out mechanism, whereby a piece of paper adhering to the form will engage one of the tripping-fingers and move a pawl or dog into engagement with a ratchet-wheel to arrest the rotation of the shaft and stop the press, substantially as set forth.

5. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft extending transversely of the machine, means, operated by the stopping of said shaft for actuating the throw-out mechanism, a ratchet-wheel mounted upon said shaft and adjustable thereon transversely of the machine, and a sheet-actuated tripping-finger sustained in position to be directly engaged by a sheet or part of a sheet and adjustable transversely of the machine and adapted to engage

the ratchet-wheel to arrest the rotation of said shaft, substantially as set forth.

6. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft extending transversely of the machine, a plurality of ratchet-wheels mounted upon the shaft and adjustable longitudinally of the shaft, a plurality of sheet-actuated tripping-fingers sustained in position to be directly engaged by a sheet or part of a sheet and adjustable transversely of the machine, each tripping-finger being adapted to engage one of the ratchet-wheels, and means operated by the stopping of said shaft for actuating the throw-out mechanism, substantially as set forth.

7. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft extending transversely of the machine, a plurality of ratchet-wheels mounted upon the shaft and adjustable thereon, a plurality of adjustably-mounted brackets embracing said ratchet-wheels, a plurality of sheet-actuated tripping-fingers mounted upon said brackets and adapted to engage said ratchet-wheels, and means operated by the stopping of said shaft for actuating the throw-out mechanism, substantially as set forth.

8. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft, driving mechanism for said shaft including a clutch, means, thrown into action by the relative movement between said clutch members, for actuating the throw-out mechanism, and a sheet-actuating tripping device supported in position to be engaged by a sheet or part of a sheet and thereby arrest the rotation of said shaft, substantially as set forth.

9. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft carrying a ratchet-wheel, driving mechanism for said shaft including a slip-clutch, means operated by the slipping of said clutch for actuating the throw-out mechanism, and a sheet-actuated tripping-finger supported in position to be engaged by a sheet or part of a sheet and adapted to engage the ratchet-wheel and arrest the rotation of its supporting-shaft, substantially as set forth.

10. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, a rotary shaft, a clutch including a member fixed to said shaft and a member movable relatively to the fixed member, suitable driving mechanism operating through said clutch, means of engagement between the throw-out mechanism and said movable member of the clutch, a ratchet-wheel mounted upon said shaft, and a sheet-actuated tripper supported in position to be directly engaged by a sheet or part of a sheet and adapted to engage said ratchet-wheel and arrest the movement of the shaft, substantially as set forth.

11. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, a rotary shaft, a clutch including a member fixed to said shaft and a member movable relatively to the shaft, suitable driving mechanism operating through the said clutch, means, operated by the relative movement between the clutch members, for connecting the throw-out mechanism with said movable member of the clutch, a ratchet-wheel mounted upon said shaft, and a sheet-actuated tripper supported in position to be directly engaged by a sheet or part of a sheet and adapted to engage said ratchet-wheel and arrest the movement of said shaft, substantially as set forth.

12. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft, suitable sheet-actuated means for arresting the rotation of said shaft, a fixed clutch member carried by said shaft, a movable clutch member engaging the fixed clutch member, a spring device connecting the movable clutch member with the fixed clutch member, suitable driving mechanism operating through the movable clutch member, and means thrown into operation by the relative movement between the fixed and movable clutch members for actuating the throw-out mechanism, substantially as set forth.

13. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft, suitable sheet-actuated means for arresting the rotation of said shaft, a fixed clutch member upon said shaft, a movable clutch member engaging with said fixed clutch member, a normally disengaged auxiliary clutch between said movable clutch member and the throw-out mechanism, and means for driving said shaft through said movable clutch member, substantially as set forth.

14. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, with a rotary shaft, sheet-actuated means for arresting the rotation of said shaft, suitable driving mechanism including an automatic clutch having a movable member comprising a rotatable longitudinally-movable sleeve, and a normally disengaged auxiliary clutch member connected with the throw-out mechanism, substantially as set forth.

15. In a machine designed to operate upon sheets of paper, the combination of suitable throw-out mechanism, a rotatable disk operatively connected with the throw-out mechanism, and an auxiliary clutch member connected with said disk, with a rotary shaft, sheet-actuated means for arresting the rotation of said shaft, a main clutch member fixed to said shaft, a main clutch member movably mounted upon said shaft in opera-

tive relation to the fixed member, a movable auxiliary clutch member fixed to the movable member of the main clutch, and means, operating through the movable member of the main clutch, for driving said shaft, substantially as set forth.

16. In a machine designed to operate upon sheets of paper, the combination of a throw-out operating device, with a rotary stop-shaft, sheet-actuated means for arresting the rotation of said shaft, a clutch having fixed and movable members for operating said shaft, means of engagement between the movable clutch member and the throw-out operating device, a gear upon said movable clutch member, a driving-shaft suitably driven from the press, and gearing between the driving-shaft and the clutch-gear, substantially as set forth.

17. In a machine designed to operate upon sheets of paper, the combination of a frictional driving-wheel adapted to operate in peripheral engagement with a rotating part of the machine, a driving-shaft upon which said frictional wheel is mounted, a pivotally-mounted bracket in which said shaft is journaled, a spring device engaging said pivotally-mounted bracket and holding the frictional wheel into operative engagement with the rotating part of the machine which drives it, a rotary trip-shaft, sheet-actuated means for arresting the rotation of said trip-shaft, a clutch upon said trip-shaft having fixed and movable members, gearing between the driving-shaft and movable member of the clutch—and means, thrown into action by the relative movement between said clutch members, for arresting the operation of the machine, substantially as set forth.

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