

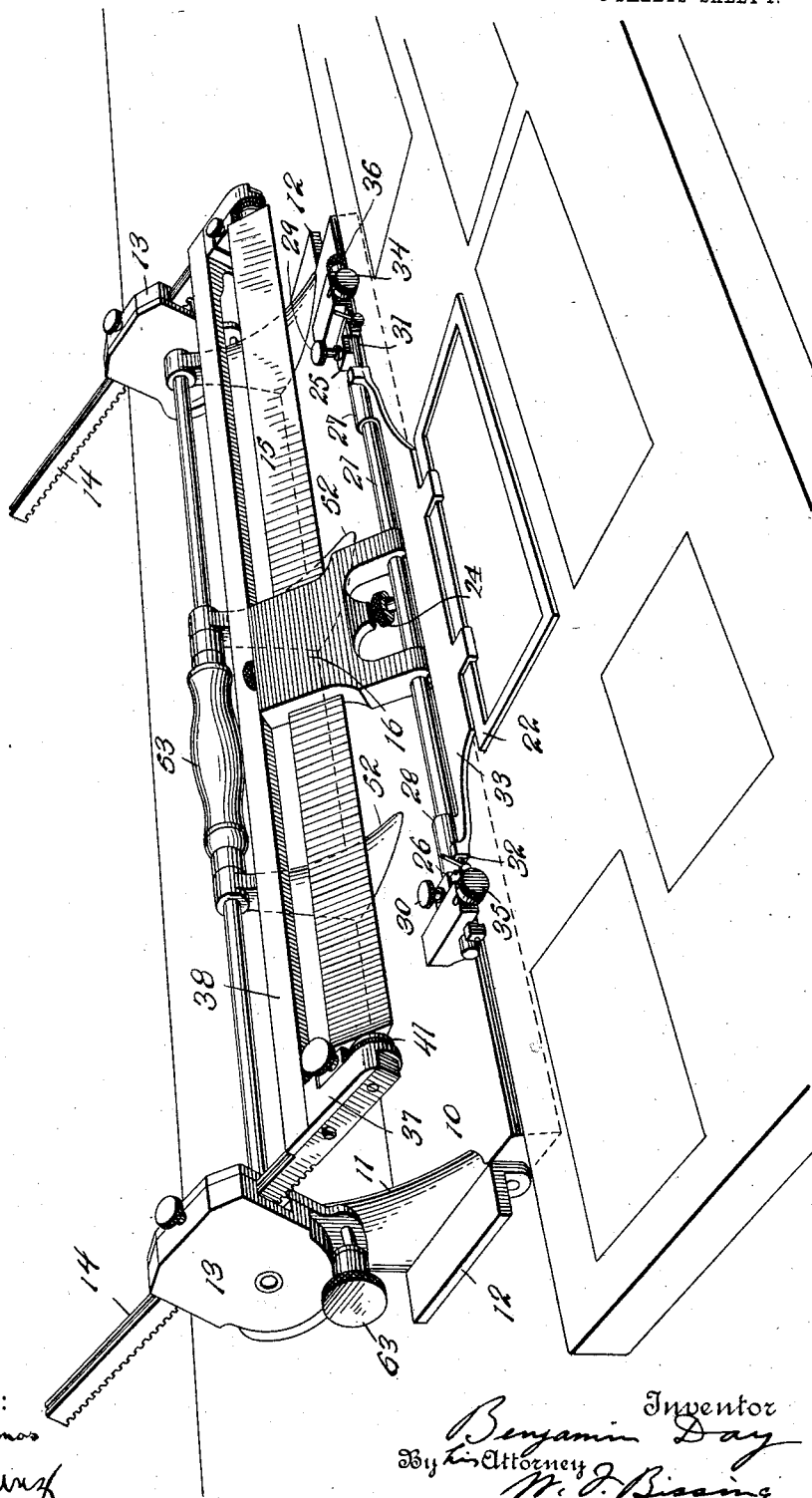
1,063,017.

B. DAY.
WIDE RANGE HOLDFAST.
APPLICATION FILED JUNE 27, 1912.

Patented May 27, 1913.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
G. Robert Thomas
Frederick J. King

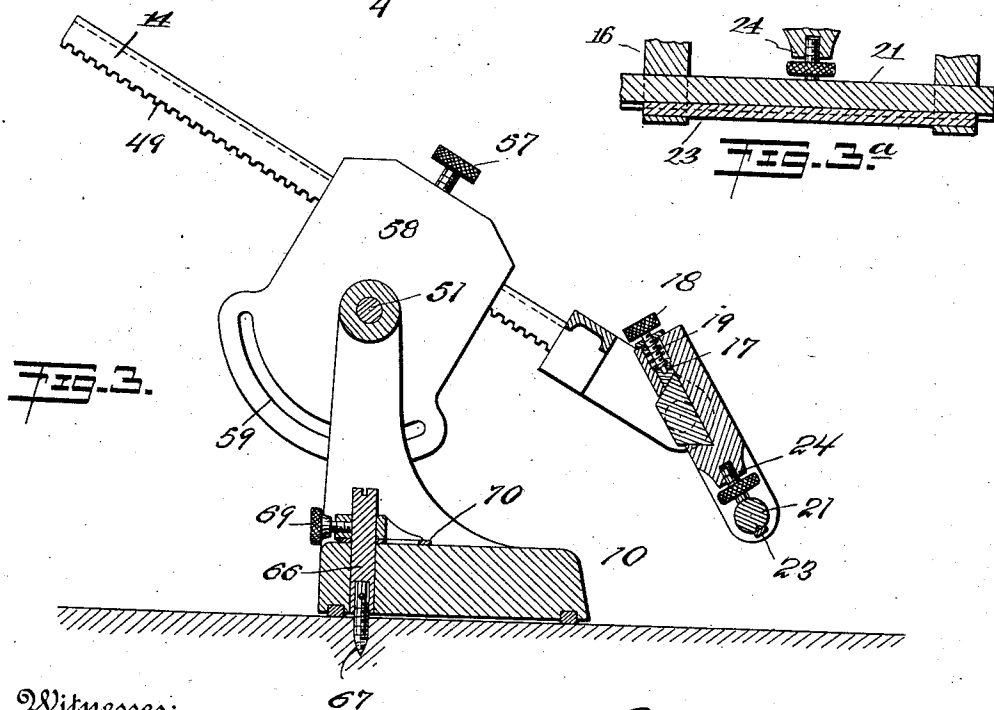
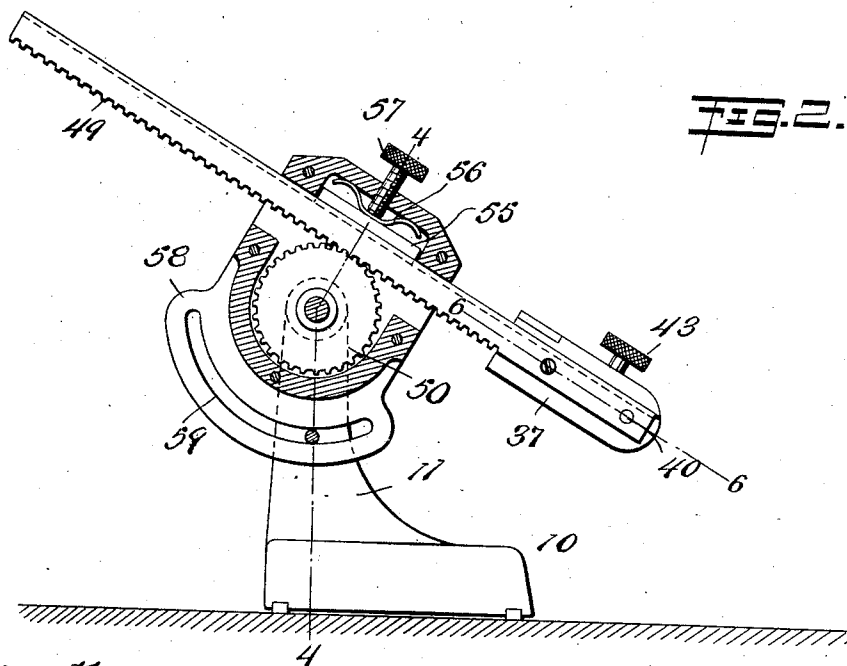
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3 SHEETS-SHEET 2.



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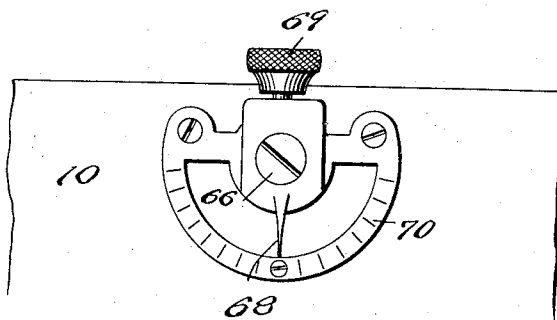
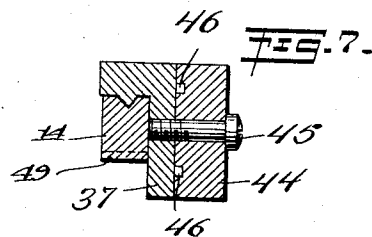
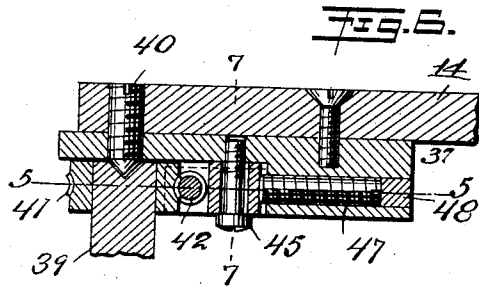
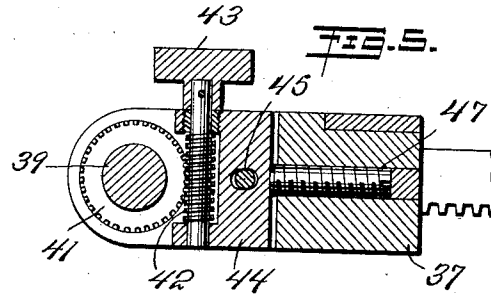
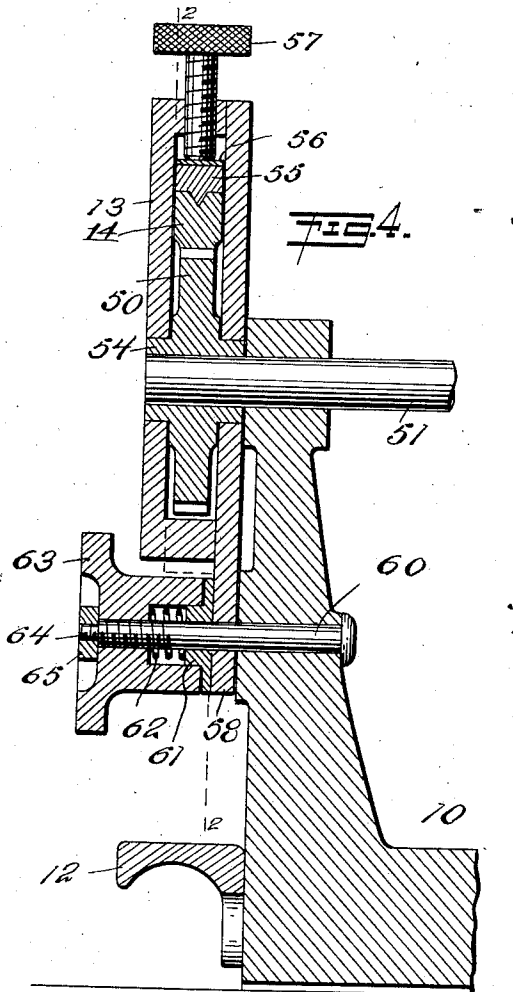
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WIDE RANGE HOLDFAST.
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Patented May 27, 1913.

3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

BENJAMIN DAY, OF SUMMIT, NEW JERSEY.

WIDE-RANGE HOLDFAST.

1,063,017.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed June 27, 1912. Serial No. 706,190.

To all whom it may concern:

Be it known that I, BENJAMIN DAY, a citizen of the United States, and a resident of Summit, Union county, New Jersey, have invented certain new and useful Improvements in Wide-Range Holdfasts, of which the following is a specification.

This invention relates to film-frame apparatus, by which is meant apparatus for supporting a printing or tinting film, in relation to the stone or other surface to be shaded, in such a way as to permit of extended movements or coarse adjustments and also micrometric adjustments of the film, to the end that the film may be carried to any position within the range of the machine and thereafter adjusted by movements of small magnitude and extreme accuracy to produce a predetermined design by successive non-registering impressions.

The invention relates more particularly to the swinging arm holdfast type of machine. This machine includes a primary supporting element, which is a weighted base which may be transported or moved about over a supporting surface and which, from a position in rear of the stone, plate or drawing to be shaded, is capable of sustaining the weight of the swinging arms and adjusting provisions that hold and position the film-frame in advance of the holdfast.

An object of the invention is to provide a highly practical holdfast machine having a wide range of movement with simplicity of construction and convenience of operation. To this end the machine presents a novel combination of provisions for effecting up and down adjustment by swinging movement of a forward-projecting frame or arms, fore and aft adjustment of the same, and a compound or wide-range transverse adjustment by means of successively supported carriages. These movements may be termed extended movements or adjustments in contradistinction to the fine or micrometric adjustments embodied in mechanism carried by the last of these intermediate movable supports.

Another object is, in conjunction on the one hand with means for effecting extended or approximate adjustment of the film-frame up and down, forward and backward and from side to side, and on the other hand with means for effecting micrometric or fine

adjustment of the frame forward and backward and from side to side, to provide means for fine up and down leveling adjustment as well.

A further object of the invention is, in conjunction with the swinging fore and aft arms or frame, to provide means for adjusting the remainder of the parts carried thereby to compensate for the angular displacement of these parts by the up and down adjustment of said arms. To this end means are provided for angularly adjusting the carriage or support carried by these arms about a transverse axis relatively thereto.

A still further object is to provide more convenient and reliable means for moving the fore and aft arms longitudinally without binding, for which purpose operating mechanism is provided for advancing or retracting the arms simultaneously.

Still another object is to provide means whereby the upward and downward tilting arms or frame are held at any position to which they may be moved and until locked. For this purpose a yielding or frictional brake is employed.

Other novel features of the invention will become apparent as the specification proceeds and will be pointed out in the appended claims.

In the accompanying drawings illustrating the invention: Figure 1 is a perspective view of the machine showing a work surface in front of the holdfast on which several positions of the film are indicated by the rectangles; Fig. 2 is a sectional side elevation on the line 2—2 of Fig. 4; Fig. 3 is a central vertical section; Fig. 3^a is a sectional detail view on line 3^a—3^b of Fig. 1. Fig. 4 is a section on the line 4—4 of Fig. 2; Fig. 5 is a detail vertical section on the line 5—5 of Fig. 6; Fig. 6 is a section on the line 6—6 of Fig. 2; Fig. 7 is a section on the line 7—7 of Fig. 6; and Fig. 8 is a fragmentary plan view of part of the base.

The transversely-elongated weighted base of the holdfast is shown at 10 and is provided at its opposite ends with standards 11. It may be transported by means of angular handle brackets 12 secured to its ends. Holders 13 are angularly adjustable on the upper parts and preferably at the outer sides of the standards 11. These holders carry fore and aft arms 14, the said arms

having extended longitudinal movement in said holders. A transverse way-bar 15 is carried by the forward parts of the arms 14. Means for securing a wide-range adjustment of the printing film, transversely across the machine, is supported from the way-bar 15. As shown, a carriage 16 is movable and lockable along this way-bar transversely across the front of the machine. The said carriage constitutes a downwardly and forwardly projecting support and is preferably in the form of a plate or block having an undercut transverse channel in its rear side receiving the beveled edges or ride-ways of the way-bar 15. The locking means for the carriage may consist of a shoe 17 conforming to the upper ride-way of the way-bar 15 and adapted to be clamped against it by a set screw 18, the shoe being yieldingly pressed against the surface of the way-bar when this screw is released by means of a spring 19. The slide block 16 is inclined downward and forward and is preferably bifurcated in its lower part as shown. A transverse rod 21 is supported in apertures in the arms of the slide block 16 and permits additional transverse movement of the film-frame 22. The said rod is shown as being transversely slidable in the slide block 16 and held from rotation therein by means of a feather 23 held in a longitudinal V-groove in the rod. The rod 21, which constitutes a simple form of wide transversely-movable carriage as the slide block 16 constitutes a form of narrow transversely-movable carriage, is lockable at any position relatively to the said slide block, as by means of a clamping screw 24 threaded into the block 16 and bearing at its opposite end against the side of the rod.

Suitable micrometric hinge devices 25 and 26 are mounted on the ends of the rod 21 and are thus supported from the lower part of the carriage 16. They embody provisions for tiltably supporting the film-frame so that it may be swung up to expose the work and for micrometrically adjusting it forward and backward and transversely. These micrometric hinge devices are not illustrated with particularity, but the construction shown in my prior Patent 813,867 of February 27, 1906, or in one of my co-pending applications may be used. The devices have supports 27, 28, which are slipped onto the ends of the rod 21 and are secured in the desired position by set screws 29 and 30. Pintles 31, 32 detachably and pivotally support a suitable film-frame holder or clamp 33 which has sockets in its ends receiving the points of these pintles. The pintles are adjusted forward and backward by micrometer screws having operating heads 34, 35, and transversely of the machine by a micrometer screw having an operating head 36, the same acting directly upon the right-hand pintle 31, the left-hand pintle 32 being sustained by a spring, not shown, so that this pintle by virtue of the connection afforded by the film-frame holder 33 partakes of the transverse adjusting movements of the right-hand pintle 31. By the foregoing instrumentalities means are provided for supporting the film-frame 22 from the ends of the rod 21. It may be noted that in addition to the rectilinear forward and backward and transverse micrometric adjustments of the film-frame, micrometric angular displacements may be effected by operating one of the fore and aft adjusters 34 and 35 and not the other, or by operating them in opposite directions or to different extents. Extended adjustment or movement of the film-frame with its film is effected by sliding the fore and aft arms 14 in their holders, and a wide range of lateral movement is afforded by sliding the carriage 16 on the way-bar 15 and the carriage or rod 21 in the carriage 16. The film-frame is adjusted to different heights by swinging the fore and aft arms 14 and their holders 13. Since the angular up and down movement of the fore and aft arms 14 would tilt the parts carried thereby and in particular the micrometric devices 25, 26, means are provided for effecting a compensating angular or rotary adjustment of such parts. In the preferred construction the way-bar or guide rod 15 is angularly adjustable about a transverse axis relatively to the fore and aft rods 14. In the specific embodiment which is considered preferable, angular supports 37 are secured at the inner and upper sides of the forward parts of the arms or bars 14, these bars being connected by a cross-bar 38 which unites the fore and aft arms to form a rigid frame. The ends of the way-bar 15 have shaft extensions 39, see Fig. 6, which receive the points of pivot screws 40 that pass through the arms 14 and the supports 37. At one or both ends of the way-bar the shaft extensions 39 carry worm wheels 41 which are engaged by operating worms 42 having knurled heads 43. The said worms are journaled in bearing blocks 44, which are movable to adjust the worm relatively to the worm wheel, so as to insure perfect engagement. As shown more particularly in Figs. 5 and 6, each of the said blocks 44 is secured against the inner face of the support 37 by means of a headed screw 45, which passes through a slotted opening in the block and is threaded onto the said support. The blocks 44 are provided with longitudinal slots which receive projections 46 on the supports 37 to insure rectilinear movement of the blocks; and are adjusted toward the worm wheels 41 by means of headless screws 47 contained within threaded openings in the supports 37. Plugs 48 inserted in the rear ends of these openings protect the screws 47 from tampering. The blocks 44

may be locked at the desired adjustment by tightening the screws 45.

It will be apparent that the worm and worm wheel 42, 41 constitute means for effecting fine up and down adjustment of the hinge supports for the film-frame, so as to level the latter accurately with reference to the surface of the work.

Means are provided for simultaneously and equally adjusting the fore and aft arms 14 in longitudinal directions. Such means may be widely varied. In the particular construction illustrated the arms 14 are in the nature of rack bars having rack teeth 49 formed on their under sides to mesh with gears 50 housed in chambers in the interiors of holders 13. These gears 50 are concentric to the axis about which the said holders are angularly adjustable. Common operating means are provided for turning the gears 50 to drive both rack bars in the same direction. To this end both gears are fixed to a transverse operating shaft 51, which has bearings in the standards 11 and also in intermediate standards 52 and between which latter it carries an operating handle or grip 53. The gears 50 are preferably provided with hubs 54 which are journaled in bearing openings in the opposite side walls of the holders 13.

Means are preferably provided for pressing the rack bars 14 against the gears 50. For this purpose shoes 55 are housed in recesses in the upper parts of the holders 13 and are provided with knife edges which are forced into V-shaped grooves in the tops of the rack bars by means of springs 56. Set screws 57 afford means for locking the rack bars to the gears 50 so as to hold the fore or aft arms or rack bars at the desired longitudinal adjustment.

Means are provided for holding the holders at any angular position to which they may be moved, and for yieldingly checking their descent. To this end the said holders may be provided with depending sector wings 58 having arcuate slots 59 formed therein for the reception of stud bolts 60 carried by the end standards 11. The outer sides of these wings 58 constitute friction surfaces with which cooperate friction members 61 mounted loosely on the stud bolts 60 and pressed against the wings by means of coiled springs 62, interposed between the said members 61 and chambered nuts 63 screwed onto the bolts. By tightening the nuts 63 the holders 13 may be locked against movement. The bolts 60 may have reduced left-hand threaded ends 64 bearing nuts 65 to limit the movement of the nuts 63.

The whole apparatus may be shifted angularly about a vertical axis which is established by a pivot 66 passing through a bearing opening in the central part and toward the rear of the base 10. This pivot carries a

wood screw 67 at its lower end for penetrating the underlying base. A pointer 68 is fixed to the said pivot by means of a set screw 69 and cooperates with a curved scale 70 mounted on the base.

What is claimed as new is:

1. In a film-frame apparatus of the holdfast type, the combination of a movable holdfast having a weighted base and standard rising therefrom, fore and aft arms and means supporting them to swing up and down on said standards, means for effecting wide-range adjustment across the front of the machine, comprising a laterally adjustable carriage carried by said arms and a second laterally adjustable carriage mounted on the first, and mechanism carried by said second carriage for tiltably supporting and micrometrically adjusting a film-frame.

2. In a film-frame apparatus of the holdfast type, the combination of a movable holdfast having a weighted base and standards rising therefrom, holders angularly adjustable on said standards, fore and aft projectable arms carried by said holders to swing up and down therewith, a transverse way-bar carried by the forward parts of said arms, a carriage mounted to have extended movement along said way-bar, a rod having extended movement in the same directions in said carriage, and means for supporting a film-frame from the ends of said rod.

3. In a film-frame apparatus of the holdfast type, the combination of a movable holdfast having a weighted base and standards rising therefrom, holders angularly adjustable on said standards, fore and aft arms having extended longitudinal movement in said holders and up and down swinging movement therewith, a transverse way-bar carried by the forward parts of said arms, a carriage, mounted between the ends of said way bar and movable from end to end thereof, a transverse rod supported by said carriage, and a hinged film-frame holder supported by said rod for extended transverse movement relative to said carriage.

4. In a film-frame apparatus of the holdfast type, the combination of a movable holdfast having a weighted base and standards rising therefrom, fore and aft arms and means for supporting the same from said standards for up and down swinging movement, a transverse member carried by the forward parts of said arms, means for angularly adjusting said member about a transverse axis relatively to said arms, and mechanism supported from said member for holding and micrometrically adjusting a film-frame.

5. In a film-frame apparatus of the holdfast type, the combination of a holdfast having standards, fore and aft arms and means supporting the same from said stand-

- ards for up and down swinging movement, a downward and forward extending support carried by said arms, means for angularly adjusting said support about a transverse axis relatively to said arms, and micrometric hinge devices supported from the lower part of said support.
- 5 6. In a film-frame apparatus of the holdfast type, the combination of a holdfast having standards, fore and aft arms and means supporting the same from said standards for up and down swinging movement, a transverse way-bar carried by the forward parts of said arms, means for adjusting said way-bar angularly about a transverse axis relatively to said arms, a carriage mounted for extended transverse movement along said way-bar, a second carriage mounted for extended transverse movement on the first, and suitable mechanism for holding and micrometrically adjusting a film-frame from said second carriage.
- 10 7. In a film-frame apparatus of the holdfast type, the combination of a holdfast having standards, fore and aft arms and means supporting the same from said standards for up and down swinging movement, a transverse bar uniting the forward parts of said arms, a transverse support carried by said arms, means for rotatably adjusting said support, and suitable micrometrically-adjustable film-frame hinge mechanism carried by said support.
- 15 8. In a film-frame apparatus of the holdfast type, a weighted holdfast having standards, a forward-projecting frame supported to swing up and down by said standards, a support mounted on the forward part of said frame for angular adjustment about a transverse axis relatively to the frame, a gear fixed to said support, and a meshing gear and means for operating the same carried by said frame, in combination with a suitable film-frame holder and micrometric adjusting mechanism between said film-frame holder and said support.
- 20 9. In a film-frame apparatus of the holdfast type, a weighted holdfast having standards, a forward-projecting frame supported to swing up and down by said standards, a transverse support rotatably mounted on the forward part of said frame, a worm wheel fixed to said support, an adjustable bearing block mounted on said frame, a worm journaled therein, and means for adjusting said bearing block relatively to said worm wheel, in combination with suitable film-frame holding and micrometric adjusting mechanism supported from said support.
- 25 10. In a film-frame apparatus of the holdfast type, a weighted holdfast comprising a base with standards, laterally-spaced fore and aft arms mounted on said standards, and means for simultaneously and equally moving said arms longitudinally, in combination with suitable film-frame holding and micrometric adjusting mechanism supported from said rods.
- 30 11. In a film-frame apparatus of the holdfast type, a holdfast, laterally-spaced fore and aft arms mounted thereon and carrying racks, gears carried by the holdfast to drive said racks, and a common transverse operating shaft connecting said gears, in combination with a suitable film-frame holder and intermediate supports.
- 35 12. In a film-frame apparatus of the holdfast type, a holdfast with standards, chambered holders supported for angular adjustment by said standards, fore and aft arms slidable through said holders and carrying racks, gears in said chambered holders to drive said racks, and operating means for rotating said gears, in combination with a suitable film-frame holder and intermediate supports.
- 40 13. In a film-frame apparatus of the holdfast type, a holdfast, laterally-spaced fore and aft arms mounted thereon and carrying racks, and gears mounted on the holdfast to drive said racks, in combination with a transverse member carried by said arms, a film-frame holder, and suitable intermediate supporting and adjusting parts between said film-frame holder and said transverse member.
- 45 14. In a film-frame apparatus of the holdfast type, a holdfast, laterally-spaced fore and aft arms mounted thereon and carrying racks, gears to drive said racks, a common transverse operating shaft for said gears, and a handle on said shaft, in combination with a suitable film-frame holder and connections between the same and said arms.
- 50 15. A holdfast comprising a weighted base with end standards and intermediate standards, a transverse operating shaft passing through said standards, holders carried by the holdfast at the end standards and angularly adjustable about axes coincident with the axis of said shaft, fore and aft rack bars carried by said holders, and gears on said shaft engaging said rack bars, in combination with a suitable film-frame holder and connections between the same and said rack bars.
- 55 16. A holdfast having a weighted base and standards rising therefrom, fore and aft rack bars mounted on said standards, gears to drive said rack bars, and springs for pressing said rack bars against the gears, in combination with a suitable film-frame holder and connections between the same and said rack bars.
- 60 17. A holdfast, a weighted base and standards rising therefrom, fore and aft rack bars mounted on said standards, gears to drive said rack bars, and means for locking said rack bars to the gears, in combination with suitable film-frame holding and micrometric adjusting mechanism supported from said rods.
- 65

tion with a suitable film-frame holder and connections between the same and said rack bars.

18. A holdfast having end supports, gears therein, fore and aft rack bars slidable in said supports and having longitudinal grooves in their sides remote from the gears, shoes in said supports, springs pressing the same into said grooves, and locking screws for forcing said shoes against the rack bars, in combination with suitable micrometric film-frame adjusting mechanism and connections between the same and said rack bars.

19. A holdfast having standards, angularly adjustable holders supported by said standards, fore and aft arms carried by said holders to swing up and down therewith, and a spring pressed frictional braking means and lock coöperating with said holders, so as to check the descent of said arms or lock them in adjusted positions, in combination with suitable film-frame holding means and micrometric connections between the same and said arms.

20. A holdfast having standards, angularly adjustable holders supported by said standards and one of which is provided with an arcuate slot, a stud bolt on the standard passing through said slot, a friction member on said stud bolt contacting with a coöperating surface on said holder, a nut threaded on said bolt, and constructed to force said friction member against said holder and a spring interposed between said nut and friction member whereby the spring may automatically check the descent of said arms and said nut may lock it in position, in combination with suitable film-frame holding means and micrometric connections between the same and said arms.

21. A holdfast having standards, fore and aft arms and means supporting the same from the standards for up and down swinging movement, a combined spring pressed brake and lock including two members one of which may be either spring pressed against said supporting means so as to check the descent of said arms or may be locked against said holder by the other member of the lock so as to maintain said arms in their adjusted positions in combination with suitable film-frame holding means and micrometric connections between the same and said arms.

22. In a film-frame apparatus, the combination of a base, holders carried thereby, fore and aft arms having extended longitudinal adjustment in said holders, said holders being adjustable relatively to the base to effect extended up and down adjustment of said arms, a carriage carried by and having extended transverse adjustment relatively to said arms, film-frame pintles supported from said carriage, mechanism

for effecting micrometric horizontal adjustments of said pintles, and means whereby a fine up and down adjustment thereof may be effected.

23. In a film-frame apparatus, the combination of a base, pintles for hingedly supporting a film-frame, means including swinging arms for effecting an angular rough up and down adjustment of said pintles, and means for effecting an angular fine up and down adjustment thereof.

24. In a film-frame apparatus, the combination with a base, of hinge supports for a film-frame, angularly adjustable arms for raising and lowering said supports relatively to the base, means for moving them forward and backward, and means for effecting fine angular up and down adjustment thereof.

25. In a film-frame apparatus, the combination of a holdfast having standards, tiltable housings at opposite ends of the holdfast, an operating shaft rotatable in said standards and in said housings, gears in the housings fixed to the ends of said shaft, a central operating handle on the shaft, rack bars slidable in said housings and meshed by said gears, and suitable micrometric film-frame holding and adjusting mechanism supported from said rack bars in front of the holdfast.

26. In a film-frame apparatus, the combination of a holdfast having standards, tiltable housings at opposite ends of the holdfast, an operating shaft rotatable in said standards and in said housings, gears in the housings fixed to the ends of said shaft, a central operating handle on the shaft, rack bars slidable in said housings and meshed by said gears, means for locking said housings to the standards at any angular position, and suitable micrometric film-frame holding and adjusting mechanism supported from said rack bars in front of the holdfast.

27. In a film-frame apparatus, the combination of a holdfast having standards, holders tiltable supported by said standards, fore and aft arms slidable in and tiltable with said holders, a cross bar uniting the forward parts of said arms to form a frame, a way-bar rotatably supported by the forward part of said frame, means for angularly adjusting and holding said way-bar, a carriage slidable thereon across the front of the machine, and suitable micrometric film-frame adjusting mechanism supported from said carriage.

28. In a film-frame apparatus, the combination of a holdfast having end and intermediate standards, an operating shaft journaled in said standards and projecting beyond the end standards, a handle on the shaft between the intermediate standards, tiltable housings outside the end standards

and provided with arcuate slots, the ends
of said shaft being rotatable in said hous-
ings, studs projecting outward from said
end standards through said arcuate slots,
5 means on said studs for holding said holders
at any desired angular adjustment, gears
on the ends of said shaft inside said hous-
ings, fore and aft rack bars slidable through
said housings and meshed by said gears,
10 spring means in the housings to urge the

rack bars into close contact with the gears,
and means for locking said rack bars at any
desired longitudinal adjustment.

In testimony whereof, I have signed my
name to this specification, in the presence of 15
two subscribing witnesses.

BENJAMIN DAY.

Witnesses:

NEIL GRADY,

WILLIAM SHELTON.

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